

MEMO

TO: Larry D. Voyles, Director

FROM: Mike Senn, Assistant Director, Wildlife Management Division

PRESENTER: Kirk Young, Fisheries Branch Chief

TITLE: Hearing on a Petition from Center for Biodiversity to Close Fossil Creek to Sport Fishing and Consideration of Amendments to Commission Order 40 to Remedy Issues Raised in the Petition

DESCRIPTION: The Commission will hear a petition from the Center for Biodiversity requesting to close Fossil Creek to sport fishing. The Commission may vote to approve or deny the petition or consider and vote on other amendments to Commission Order 40 to remedy the issues raised in the petition. The Commission may vote to take action on, or provide the Department direction on this item.

DATE: September 24, 2009

Summary:

A special regulation roundtail chub (*Gila robusta*) season for Fossil Creek was approved by the Commission in October of last year. The Commission established a seven month season, from the first Saturday in October through April 30, for a 4.5 mile stretch (of ~10 miles available) of the creek. Methods approved for the season were catch and release only, artificial fly and lure and single barbless hook only.

On September 18, 2009, a petition to close Fossil Creek and its watershed to sport fishing was received from the Center for Biodiversity (copy attached). The petition includes genetic information that indicates the majority of chubs in the reach to be opened for fishing are headwater chubs (*Gila nigra*), a closely allied species to the roundtail chub. Both species are candidates for federal listing. In July, Director Voyles forwarded an information memo to the Commission providing input on the new genetic information from Fossil Creek and related issues (copy attached). As the information memo summarizes, the angling season at Fossil Creek poses no harm to chub populations or anglers, rather the management scheme provides great opportunity to promote a native fish fishery and the conservation of native species overall.

Recommendation:

The Department recommends the Commission VOTE TO APPROVE OR DENY THE PETITION OR CONSIDER AND VOTE ON OTHER AMENDMENTS TO COMMISSION ORDER 40 TO REMEDY THE ISSUES RAISED IN THE PETITION.

MS:ky

Attachments: Petition packet
Commission Memo

RECENT GENETICS INFORMATION ON *GILA* IN FOSSIL CREEK, ARIZONA

Thomas E. Dowling, Arizona State University, Tempe. thomas.dowling@asu.edu
Paul C. Marsh, Marsh & Associates, LLC, Tempe. fish.dr@nativefishlab.net

February 10, 2009

Summary. Chubs (genus *Gila*) in the reach of Fossil Creek between the “High Falls” upstream from Irving and the artificial fish barrier are predominantly headwater chub *Gila nigra*. Ninety-two percent of fish between the “High Falls” and Irving were assignable to *G. nigra* and approximately half (48%) of the fish between Irving and the fish barrier were assignable to *G. nigra*. No fish in the reach between the “High Falls” and Irving was assignable to roundtail chub *G. robusta* and only 25% of fish between Irving and the fish barrier was assignable to *G. robusta*.

Detail and Explanation. We used analysis of 10 microsatellite loci to further analyze genetic variation within and among samples of *Gila* from Fossil Creek and to place them into context of that found in *Gila robusta* from the nearby Verde River. Previously analyzed samples included *G. nigra* from Fossil Spring (N=26) and *G. robusta* from the Verde River at Perkinsville (N=20) and West Clear Creek (N=29) (previously reported in Dowling et al. 2008). Three additional samples, Fossil Creek above Irving (N=24; between the “High Falls” and the falls at Irving), Fossil Creek below Irving (N=24; between the falls at Irving and the constructed fish barrier), and Verde River at Tapco (N=8), were added to the above and all six samples (N=131) were subjected to assignment testing using the program STRUCTURE (Pritchard et al. 2000).

Using the standard of 90% probability, 59 individuals were assigned to *G. nigra* and 63 to *G. robusta* (see Table 1, below). Nine individuals exhibited evidence of admixture between these two forms. Individuals in these groups were not randomly scattered. All individuals from the Verde River (N=57) were assigned to *G. robusta* as were a small number of individuals from the reach of Fossil Creek below Irving (6 of 24 specimens). *Gila nigra* was widely distributed and common throughout Fossil Creek, including all 26 individuals in the spring, 22 of 24 individuals in the reach above Irving, and nearly half (11 of 24) in the reach below Irving. There was also evidence for admixture between *G. nigra* and *G. robusta* in reaches above and below Irving (N=2 and 7, respectively).

Table 1. Summary of assignments of samples of *Gila* spp. from three reaches of Fossil Creek and the Verde River using the program STRUCTURE based on 90% probability, expressed as percentage.

Reach/Taxa	<i>G. nigra</i>	<i>G. robusta</i>	admixed
Fossil Springs	100	0	0
Falls to Irving	92	0	8
Irving to barrier	46	25	29
Verde River	0	100	0

References Cited.

- Dowling, T. E., P. C. Marsh, C. D. Anderson, M. S. Rosenberg, and A. T. Kelsen. 2008. Population structure in the roundtail chub (*Gila robusta* complex) of the Gila River basin as determined by microsatellites. Report to Arizona Game and Fish Department, Contract # AGR 4/21/04 through funding provided by U.S. Fish and Wildlife Service Agreement 20181-4-J824F and Bureau of Reclamation Agreement 1425-97-AA-32-00420 (Gila River Basin Native Fishes Conservation Program task 3-46). Arizona State University, Tempe. 56 pages.
- Pritchard, J. K., M. Stephens, and P. Donnelly. 2000. Inference of population structure using multilocus genotype data. *Genetics* 155:945-59.



THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT

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MEMORANDUM

TO: Arizona Game and Fish Commission

FROM: Larry D. Voyles, Director

SUBJECT: Fossil Creek and Distribution of Headwater Chub

DATE: July 30, 2009

The Department recently received preliminary genetic information suggesting headwater chub (*Gila nigra*) may be distributed within the area of Fossil Creek scheduled to open to fishing for roundtail chub (*Gila robusta*) this October. A copy of this preliminary information developed by Arizona State University (ASU) is attached. A fishing season for headwater chub is not currently open anywhere in the state and there may be concern from some members of the public that the roundtail chub season may negatively impact headwater chub where the distribution of these species overlaps. It is virtually impossible for anglers or biologists to visually differentiate between the two species. The literature concerning the genetic relatedness and taxonomy of headwater chub and roundtail chub has a long and confounding history, and much uncertainty exists in the ability to taxonomically or genetically distinguish between the two species. At this time we propose no action in response to this information. Rather, we are assessing this and other information and are working with ASU and other experts to best manage these species. If regulation changes are in the best interest of these species, we will provide a thoughtful and measured recommendation to this complex biological situation that will be presented during the biennial Commission Order 40 process next October (2010). This decision is based on the following key information:

- No significant harm to headwater chub through accidental by catch will occur, as very conservative regulations are in place for Fossil Creek; specifically, catch and release only, artificial fly and lure, single barbless hooks;
- Similarly, because of the catch and release regulations, anglers will not be placed at risk of citation for unintentional possession of headwater chub;
- This new information is preliminary, very brief in nature, and has not been peer reviewed. Peer-review is critical in general, but especially for genetic work due to the requirement to make genetic material available to other researchers through a Genetics-Bank;
- Headwater and roundtail chub are virtually indistinguishable in appearance. Researchers require large sample sizes and average morphometric and meristic (dimension and numeric characteristics) information to separate the two;

Commissioners

July 30, 2009

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- Headwater and roundtail chub are genetically indistinguishable; headwater chub are genetically more closely related to Gila chub (*Gila intermedia*) and roundtail chub within a given geographic region than to headwater populations in other regions.

Opening a headwater chub season was considered; however, a recommendation for the Commission to take action based on preliminary and incomplete information would be unwarranted and might create an unfavorable precedent for future Commission actions.

Lastly, you may have heard that roundtail chub has been classified as a Federal candidate for listing. This change in status does not impact plans for management of this species as a sport fish at Fossil Creek. In fact, it reaffirms the importance of this endeavor and the narrow window of opportunity to show how this species can be successfully conserved through angling.

My staff would like to invite interested Commissioners out to Fossil Creek to see the area and how the native fish populations, especially chub, have responded. Kirk Young will contact Chairman Hernbrode to see if there is interest and schedule a date. In the interim, please do not hesitate to give Kirk Young (623-236-7259) or Region 2 Fish Program Manager Scott Rogers (928-214-1245) a call if you have questions.

:ky

Attachment

cc: Ron Sieg
Rod Lucas
Mike Semm

RECENT GENETICS INFORMATION ON *GILA* IN FOSSIL CREEK, ARIZONA

Thomas E. Dowling, Arizona State University, Tempe. thomas.dowling@asu.edu
Paul C. Marsh, Marsh & Associates, LLC, Tempe. fish.dr@nativefishlab.net

February 10, 2009

Summary. Chubs (genus *Gila*) in the reach of Fossil Creek between the "High Falls" upstream from Irving and the artificial fish barrier are predominantly headwater chub *Gila nigra*. Ninety-two percent of fish between the "High Falls" and Irving were assignable to *G. nigra* and approximately half (48%) of the fish between Irving and the fish barrier were assignable to *G. nigra*. No fish in the reach between the "High Falls" and Irving was assignable to roundtail chub *G. robusta* and only 25% of fish between Irving and the fish barrier was assignable to *G. robusta*.

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- Pritchard, J. K., M. Stephens, and P. Donnelly. 2000. Inference of population structure using multilocus genotype data. *Genetics* 155:945-59.

September 18, 2009

FAX'd to: (623) 236-7299 & (623) 236-7930; Hardcopy via US Postal Service

Petition for the Closure of Hunting, Fishing, or Trapping Privileges on Public Land

Specifically, this Petition requests the closure of Fossil Creek to sport fishing for roundtail chub (*Gila robusta*). This closure is necessary because, at the October 10-11, 2008, Arizona Game and Fish Commission Meeting, the Commission issued an errant Order opening Fossil Creek to sport fishing for the wrong fish species. The best available science demonstrates that the predominant chub in Fossil Creek is not the roundtail chub (*Gila robusta*) planned for sport fishing by the Commission, but is rather headwater chub (*Gila nigra*), an Arizona protected species.

Part 1 - Identification of Petitioners

Robin Silver, M.D,
Co-Founder/Board Member
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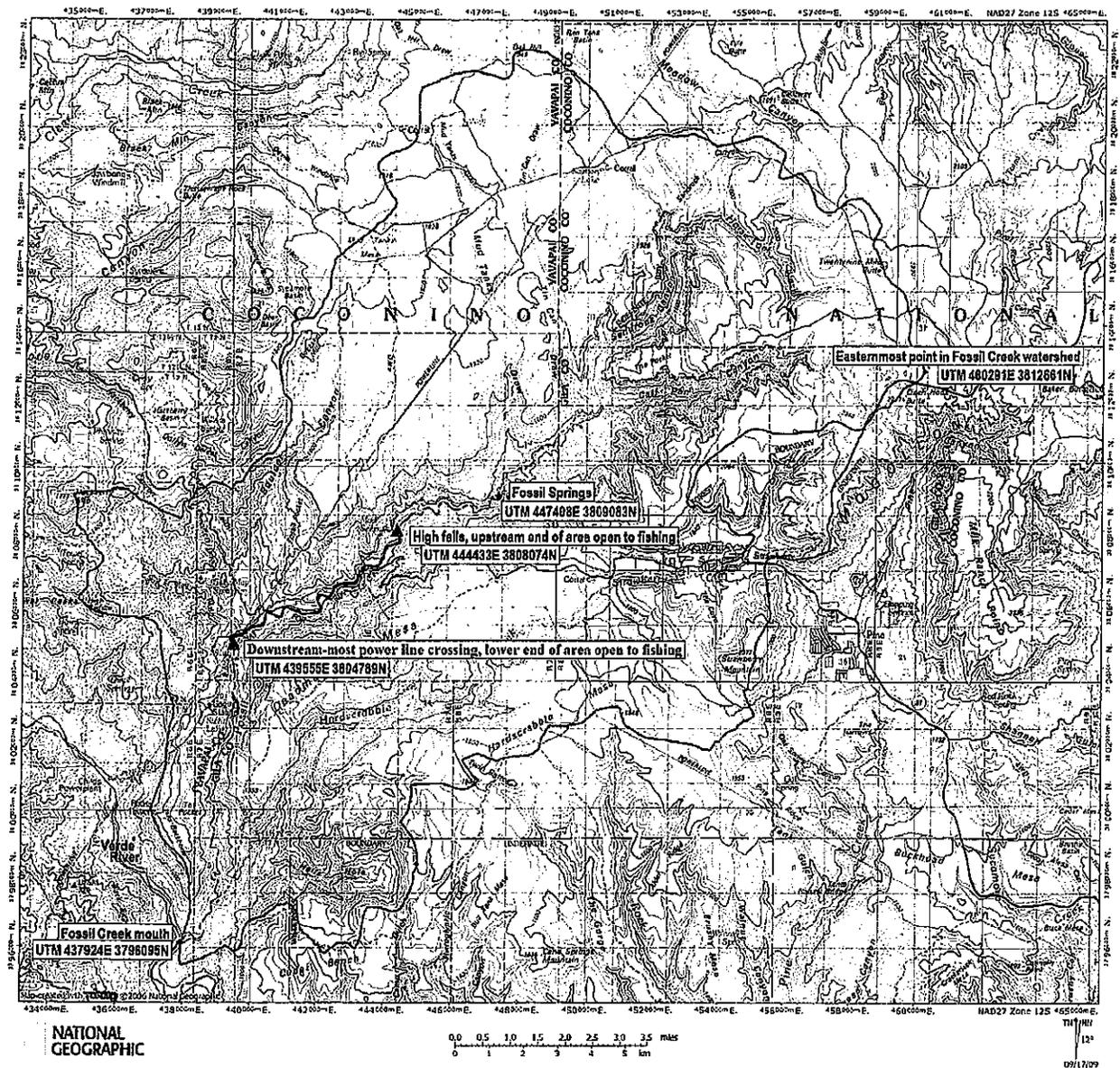
Part 2 - Request for Closure

Type of closure requested:

Sport fishing.

A complete legal description of the area to be closed:

Fossil Creek watershed: The area requested for closure to sport fishing is inclusive of the entire watershed of Fossil Creek, from the mouth upstream and including all tributaries and stock tanks. The area included for closure includes the reach scheduled to be opened to sport fishing on October 3, 2009 (shown on the following map as a blue line). Geographic locations are shown on the following map and include UTM coordinates for the mouth and other important features.



Fossil Creek Watershed, Gila and Yavapai Counties, Arizona

The watershed boundary is shown with red line.

The reach of Fossil Creek to be opened to sport fishing Oct. 3, 2009 is shown as a blue line

(UTM coordinates on the map are NAD27, Zone 12S)

The name or identifying number of any road and the portion of the road affected by the closure:

No road closure is requested by this Petition.

The dates proposed for the closure:

Permanent.

Part 3 - Reason for Closure

Reason why the closure should be considered...Any data or other justification supporting the reasons for the closure with clear reference to any exhibits that may be attached to the petition:

Please see attachments, which include the summary statement,

“chubs in the approved roundtail chub fishing reach of Fossil Creek between the “High Falls” and Irving are 92% headwater chub and 8% admixed species; there are no roundtail chub in that reach. Chubs in the approved roundtail chub fishing reach between Irving and the downstream boundary of the approved area are 46% headwater chubs, 29% admixed, and only 25% roundtail chub. Thus, the great majority of chubs in the approved fishing reach are headwater chub and not roundtail chub.”

Each individual or segment of the public the petitioner believes will be impacted by the closure, including any other valid licensees, lessees, or permittees that will or may be affected, and how they will be impacted, including both positive and negative impacts:

Fishing licensees will be positively affected by the knowledge that they will not be catching the wrong fish species, and will not be violating Arizona Fishing Regulations (2009-2010) which protect headwater chub.

Fishing licensees will be negatively impacted by continuation of the current sport fishing closure, now in effect for more than two and one half years.

Native fish advocates, including the Petitioners, will be positively affected in that headwater chub will not be inappropriately harmed by an errant Arizona Game and Fish Commission order.

Scientists currently studying the recovery of Fossil Creek and its native fishes, including those studying the genetics of headwater and roundtail chub, will be positively affected as a new and complicating variable (sport fishing) will not be prematurely implemented.

Part 4 _ Dates and Signatures

A handwritten signature in black ink, appearing to read "Robin Silver MD". The signature is fluid and cursive, with a prominent vertical stroke at the end.

Robin Silver, MD, signing for the Center for Biological Diversity and the above listed Petitioners.

September 18, 2009.

ARIZONA STATE UNIVERSITY
P.O. Box 874501

School of Life Sciences
Tempe, Arizona 85287-4501

February 12, 2009

Members of the Arizona Game and Fish Commission:

Bob Hernbrode, Chair; Jennifer L. Martin, Phoenix; Robert R. Woodhouse, Roll;
Norman W. Freeman, Chino Valley; William H. McClean, Gold Canyon

Dear Commissioners:

This letter provides new, scientific information that is relevant to the recently approved sport fishery for roundtail chub in Fossil Creek. Specifically, it has been determined that most chub within the stream reach approved for fishing are **not** roundtail chub. Instead, they are a different species, the headwater chub, which is a state protected species and a candidate for federal listing under the Endangered Species Act.

Recent information (please refer to the attached summary document) shows that chubs in the approved roundtail chub fishing reach of Fossil Creek between the "High Falls" and Irving are 92% headwater chub and 8% admixed species; there are no roundtail chub in that reach. Chubs in the approved roundtail chub fishing reach between Irving and the downstream boundary of the approved area are 46% headwater chubs, 29% admixed, and only 25% roundtail chub. Thus, the great majority of chubs in the approved fishing reach are headwater chub and not roundtail chub.

According to the Arizona Game and Fish Department's 2009 & 2010 Fishing Regulations, headwater chub is a native fish that is "protected statewide and may not be possessed." Further, "If any of these protected native fish are incidentally caught, they must be immediately released unharmed." We question how is it possible for an angler to "incidentally" catch a headwater chub when that species is the only chub, or the most common chub, in the water being fished? Such capture can only be intentional. Moreover, the situation is exacerbated by the fact that it is virtually impossible to tell the two chubs apart, even for a trained professional.

In light of this new information we respectfully request the commission reconsider its recent decision to open a portion of Fossil Creek to sport fishing for roundtail chub. We are available to provide additional information or participate in discussion about this important matter. Thank you for your consideration of this request, and we look forward to hearing from you soon.

Sincerely,

Thomas E. Dowling, Professor
Paul C. Marsh, Emeritus Faculty

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