

Fish Species Diversity Report
Kaibab National Forest Plan Revision
By: Albert Sillas, Fisheries Biologist, Prescott NF

The Fish Species Diversity process identifies federally Threatened and Endangered species, Species-of-Concern, and Species-of-Interest for the Forest Plan Revision process (FSH 1909.12, Chap. 40, Sec. 43.22). The steps for the process documented in this report include the following:

- Process for identification of species.
- Process for collecting information about each species.
- Process for screening of species.
- Species status within the Ecosystem Diversity context.
- Species risk assessment.

I. IDENTIFICATION OF SPECIES

The guidance for identification of fish species that are to be considered in the land management planning process followed national direction (Washington Office memo 03/22/2007). The three categories of species for consideration in the species diversity assessment are identified by the following:

- Species that are federally listed as Threatened or Endangered (T&E) under the Endangered Species Act (ESA).
- Species-of-Concern (SOC) – these are species for which management actions may be necessary to prevent listing under the ESA.
- Species-of-Interest (SOI) – these are species for which management actions may be necessary to achieve ecological or other multiple-use objectives. They may be species for which there are local concerns resulting from declines in habitat, population, and/or distribution, species that are of high public interest, or species such as invasives for which control measures may be desirable.

The process for identifying the list of species under each category is as follows:

THREATENED AND ENDANGERED SPECIES

Criteria for identifying T&E species are based on the list of Threatened and Endangered species maintained by the U.S. Fish and Wildlife Service. Identification can include species with no current occurrences in the planning area but with expectations of establishment based on recovery plans.

SPECIES-OF-CONCERN

Criteria for identifying SOC species are specified in FSH 1909.12, Chap. 40, Sec. 43.22b as follows:

- Species identified as proposed and candidate species under ESA.

- Species ranked G-1, G-2 and G-3 by NatureServe
- Subspecific taxa ranked T-1, T-2 and T-3 by NatureServe.
- Species that have been petitioned for federal listing and for which a positive “90-day finding” has been made.
- Species that have been recently delisted including those delisted within the past five years and other delisted species for which regulatory agency monitoring is still considered necessary.

SPECIES-OF-INTEREST

There is more discretion in the identification of SOI. The list of potential SOI species was developed based on the following:

- Species with ranks of S-1, S-2, N-1 or N-2 on the NatureServe ranking system.
- State listed threatened and endangered species.
- Species identified as species of conservation concern in State Comprehensive Wildlife Strategies.
- Additional species that may be of regional or local conservation concern due to:
 - Significant threats to populations or habitat
 - Declining trends in populations or habitat
 - Rarity
 - Restricted ranges (e.g., narrow endemics, disjunct populations, species at the edge of their ranges)
- Regional Forester Sensitive Species List.

II. INFORMATION COLLECTION

Information gathering was conducted from various sources to make the assessment of species occurrence in the planning area and to categorize species. Species information was taken from the following sources:

- U.S. Fish and Wildlife Service: recovery plans and federal register documents.
- U.S. Fish and Wildlife Service website (www.fws.gov/arizonaes/): species listed as Threatened, Endangered, Proposed, and Candidate under the Endangered Species Act (ESA) and that occur in Arizona.
- NatureServe website (www.natureserve.org): species ranges and information.
- Arizona Heritage Database (www.azgfd.gov): species occurrences and information.

Web pages for each species identified by the T&E, SOC, and SOI criteria were archived into the electronic project folder. Species information was incorporated into an Access Database. The databases include information on species ranges, habitat associations, population status, species threats, screening rationale, and references.

III. SCREENING OF SPECIES

The screening of T&E, SOC, and SOI used the following criteria (FSH 1909.12, Chap. 40, Sec. 43.22D) in order to determine if the species required further consideration in the planning process:

- Species for which there are no known occurrences or potential habitat in the plan area (this would be the case when initial assessment of a species range includes the plan area but more detailed assessment shows the species and its habitat absent from the area).
- Species which are secure in the plan area based on knowledge of their occurrence, distribution, availability of habitat, and responses to any management or natural disturbances that might occur.
- Species which are not affected by any current or potential form of management or lack of management.
- Species for which there is too little information known to complete a credible assessment of appropriate management actions.

Table 1 gives the results of the Identification and Screening Process. A total of 33 fish species were identified as occurring in Arizona. Thirty-two fish species were dropped from further analysis because the species and its habitat did not occur on the Kaibab National Forest. Tables 2 give the species that are being carried forward. The Apache trout, a federally threatened species, is the only species that occurs on the forest and is considered for further analysis. All species that were dropped from analysis and the rationale for screening are given in Appendix A.

Table 1. Results of Fish Species Identification and Screening.

Taxon	Total Species Identified	Species dropped from further analysis	Species carried forward
Fish	33	32	1

Table 2. Fish Species Carried Forward for Analysis on the Kaibab NF.

Common Name	Scientific Name	Criteria for Identifying Species	Species Category
Apache trout	<i>Onchorhynchus apache</i>	Threatened	T&E

IV. STATUS OF SPECIES

The species carried forward for further consideration in this process is assigned to the Aquatic Category used for Ecosystem Diversity Analysis (FSH 1909.12, Chap 40, Sec. 43.12). Ecosystem diversity for the Aquatic Category is addressed at the 4th HUC (Hydrological Unit Code) Subbasin and 5th HUC Watershed scales (see Water Resources Report).

4th HUC Subbasin

The Kaibab NF land base falls within portions of eight 4th HUC subbasins that are part of the Lower Colorado River Basin (see Water Resource Report). Based on Forest-specific observations (and not NHD data) of perennial stream extent, the Forest only contributes about 1.5 miles (or 2.2%) of perennial streams out of about 340 miles subbasin-wide at the 4th HUC. The Lower Colorado River of Marble Canyon Area 4th HUC is the only subbasin with perennial water on the Kaibab NF. The Apache trout is the only fish species occurring on the forest in this subbasin.

Table 3. Native fish occurrence within HUC4 subbasins

HUC NAME	Apache trout	Bluehead sucker	Bonytail chub	Colorado pikeminnow	Desert sucker	Fannemouth sucker	Gila chub	Humpback chub	Longfin dace	Razorback sucker	Roundtail chub	Sonora sucker	Speckled dace	Spikedace
Paria River		C				C							C	
Lower Colorado River of Marble Canyon Area	I	C	H	H		C		C		H	H		C	
Lower Colorado River of Grand Canyon Area		C	H	H		C		C		H	H		C	
Kanab Creek		C				C		C					C	
Havasus Creek		C				C		C					C	
Lower Little Colorado River		C				C		C					C	
Big Chino Wash							C						C	
Upper Verde River				H	C		C		C	H	C	C	C	C

Source: Arizona Statewide Freshwater Assessment (www.azconservation.org)

Legend: C = Current occurrence; H = Historical occurrence; I = Introduced

5th HUC Watershed

The Kaibab NF land base falls within portions of twenty-nine 5th HUC watersheds that are part of the Lower Colorado River Basin (see Water Resource Report). Only twelve of these watersheds contain any perennial water that would provide aquatic habitat for fish species. Based on Forest-specific observations (and not NHD data) of perennial stream extent, the Forest only contributes about 1.5 miles (or <1%) of perennial streams out of about 197 miles watershed-wide at the 5th HUC. The only perennial stream on the Kaibab NF is North Canyon Creek (North Kaibab RD) with 1.5 miles of perennial water. The total extent of this perennial stream is located on the forest within the Saddle Mountain Wilderness. It is located within the North Canyon

Wash 5th HUC. The Apache trout is the only fish species occurring on the forest in this watershed.

Table 4. Native fish occurrence within HUC5 watersheds

HUC NAME	Apache trout	Bluehead sucker	Bonytail chub	Colorado pikeminnow	Desert sucker	Fannemouth sucker	Gila chub	Humpback chub	Longfin dace	Razorback sucker	Roundtail chub	Sonora sucker	Speckled dace	Spikedace
North Canyon Wash	I													
Tatahatso Wash- Lower Colorado River			H	H		C		C		H	H		C	
Bright Angel Creek- Lower Colorado River		C	H	H		C		C		H	H		C	
Shinumo Creek- Lower Colorado River		C	H	H		C		C		H	H		C	
Tapeats Creek- Lower Colorado River			H	H		C		C		H	H		C	
Jacob Canyon – Kanab Creek													C	
Jumpup Canyon-Kanab Creek		C				C		C					C	
Heather Wash														
Lee Canyon – Lower Little Colorado River		C		H						H	C			
Hell Canyon														
Sycamore Creek					C						C	C		
Grindstone Wash- Upper Verde River				H	C				C	H	C	C	C	C

Source: Arizona Statewide Freshwater Assessment (www.azconservation.org)

Legend: C = Current occurrence; H = Historical occurrence; I = Introduced

Aquatic Diversity

The scarcity of perennial waters located on the Kaibab NF limits the occurrence of native fish species within the forest. The Forest has a very limited role in making a positive contribution to the conservation of native fish species within these subbasins or watersheds because of the limited amount of perennial water on the forest.

Only one native fish species currently exist on the forest. The Apache trout, a federally threatened species, did not historically occur on the forest but was introduced into North Canyon Creek on the North Kaibab RD in the 1970's (U.S. Fish and Wildlife Service 1983). This stream

supports a pure Apache trout population (Ord Creek lineage) and has been used to replicate this lineage into streams within its historical range (U.S. Fish and Wildlife Service 2007).

V. SPECIES RISK ASSESSMENT

This section deals with the determination of threats contributing to species risk and screening those threats. Threats are evaluated through habitat associations with one or more ecosystem diversity characteristics. The species carried forward for analysis, the Apache trout, is associated with the Aquatic Category – water. Therefore, all the threats identified for the HUC 5 are also threats to the species. In addition, the relative risk from historic vegetation departure within the watershed may also impact the distribution and abundance of this species. The steps to screening threats involve determining which threats can be effectively controlled, mitigated, or modified. This process is completed by answering the following questions:

- 1) Is the threat under agency control (i.e. can we decide whether or not to perform that action?).
- 2) Is the threat under agency authority (i.e. can we regulate or mitigate the effects of the actions?).

Threats with a negative response to these two questions are outside of agency jurisdiction and are dropped from further consideration in the plan revision.

The Apache trout occurs in North Canyon Creek within the North Canyon Wash 5th HUC. The Water Resource Report gives the following summary of conditions for this creek:

- This creek is thought to be at or near historic water flow conditions.
- The riparian conditions are thought to be near historic conditions.
- The stream channel is classified in good condition and is not diverted or substantially altered so is not diverted from reference condition.

However, the North Canyon Wash HUC5 shows a High relative risk from Historic Vegetation Departure. A main threat in this watershed is uncharacteristic fire which could have adverse impacts to the Apache trout and its habitat in the creek.

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U.S. Fish and Wildlife Service. 1983. Arizona (Apache) Trout Recovery Team, Albuquerque, New Mexico.

U.S. Fish and Wildlife Service. 2007. Draft Apache Trout Recovery Management Plan, Second Revision. U.S. Fish and Wildlife Service. Albuquerque, New Mexico.

APPENDIX A

Fish Species dropped from further consideration in the Kaibab NF planning process.

Scientific Name	Common Name	Criteria for identifying Species	Species Category	Screening Rationale	References
<i>Cyprinella formosa</i>	Beautiful shiner	Threatened	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Cyprinodon eremus</i>	Quitobaquito desert pupfish	Endangered	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Cyprinodon macularius</i>	Desert pupfish	Endangered	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Gila cypha</i>	Humpback chub	Endangered	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Gila ditaenia</i>	Sonora chub	Threatened	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Gila elegans</i>	Bonytail	Endangered	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Gila intemedia</i>	Gila chub	Endangered	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Gila purpurea</i>	Yaqui chub	Endangered	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Gila seminuda</i>	Virgin River chub	Endangered	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Ictalurus pricei</i>	Yaqui catfish	Threatened	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Lepidomeda vittata</i>	Little Colorado spinedace	Threatened	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Meda fulgida</i>	Spikedace	Threatened	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Onchorhynchus apache</i>	Apache trout	Threatened	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Onchorhynchus gilae</i>	Gila trout	Threatened	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.

Scientific Name	Common Name	Criteria for identifying Species	Species Category	Screening Rationale	References
<i>Poeciliopsis o. occidentalis</i>	Gila topminnow	Endangered	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Poeciliopsis occidentalis sonoriensis</i>	Yaqui topminnow	Endangered	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Tiaroga cobitis</i>	Loach minnow	Threatened	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Xyrauchen texanus</i>	Razorback sucker	Endangered	T&E	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Agosia chrysogaster ssp.1</i>	Yaqui longfin dace	G4T1	SOC	Species range does not include the planning area.	NatureServe website
<i>Archoplites interruptus</i>	Sacramento perch	G3	SOC	Species range does not include the planning area.	NatureServe website
<i>Campostoma ornatum</i>	Mexican stoneroller	G3	SOC	Species range does not include the planning area.	NatureServe website
<i>Catostomus discobolus jarrovii</i>	Zuni bluehead sucker	G4T1	SOC	Species range does not include the planning area.	NatureServe website
<i>Catostomus insignis</i>	Sonora sucker	G3	SOC	Species range does not include the planning area.	AGFD website; NatureServe website.
<i>Catostomus sp. 3</i>	Little Colorado sucker	G2	SOC	Species range does not include the planning area.	NatureServe website
<i>Gila nigra</i>	Headwater chub	Candidate	SOC	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Gila robusta</i>	Roundtail chub	G3	SOC	Species range does not include the planning area.	AGFD website; NatureServe website;
<i>Plagopterus argentissimus</i>	Woundfin	Endangered/ XN	SOC	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Ptychocheilus lucius</i>	Colorado pikeminnow	Endangered/ XN	SOC	Species range does not include the planning area.	NatureServe website; USFWS website.
<i>Agosia chrysogaster</i>	Longfin dace	FS Sensitive	SOI	Species range does not include the planning area.	AGFD website; NatureServe website.
<i>Catostomus clarki</i>	Desert sucker	FS Sensitive	SOI	Species range does not include the planning area.	AGFD website; NatureServe website.

Scientific Name	Common Name	Criteria for identifying Species	Species Category	Screening Rationale	References
<i>Catostomus discobolus</i>	Bluehead sucker	FS Sensitive	SOI	Species range does not include the planning area.	NatureServe website
<i>Catostomus latipinnis</i>	Flannelmouth sucker	S2	SOI	Species range does not include the planning area.	NatureServe website
<i>Rhinichthys osculus</i>	Speckled dace	AZ-SGCN	SOI	Species range does not include the planning area.	AGFD website, 2006.

Legend:

Endangered: Listed as Endangered under the Endangered Species Act.

Threatened: Listed as Threatened under the Endangered Species Act.

Candidate: A Candidate for listing under the Endangered Species Act.

XN: Nonessential population as classified under the Endangered Species Act.

FS = Forest Service

AZ-SGCN = Arizona species greatest conservation need (AGFD 2006).