



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
2005 NE Green Oaks Blvd., Suite 140  
Arlington, Texas 76006

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### Memorandum

To: File (S:\T&E\ESA Section 7\IPaC\Determination Keys\PC)

From: Sean Edwards, Fish & Wildlife Biologist

Through: Omar Bocanegra, Supervisory Fish & Wildlife Biologist

Subject: Pepered Chub Determination Key

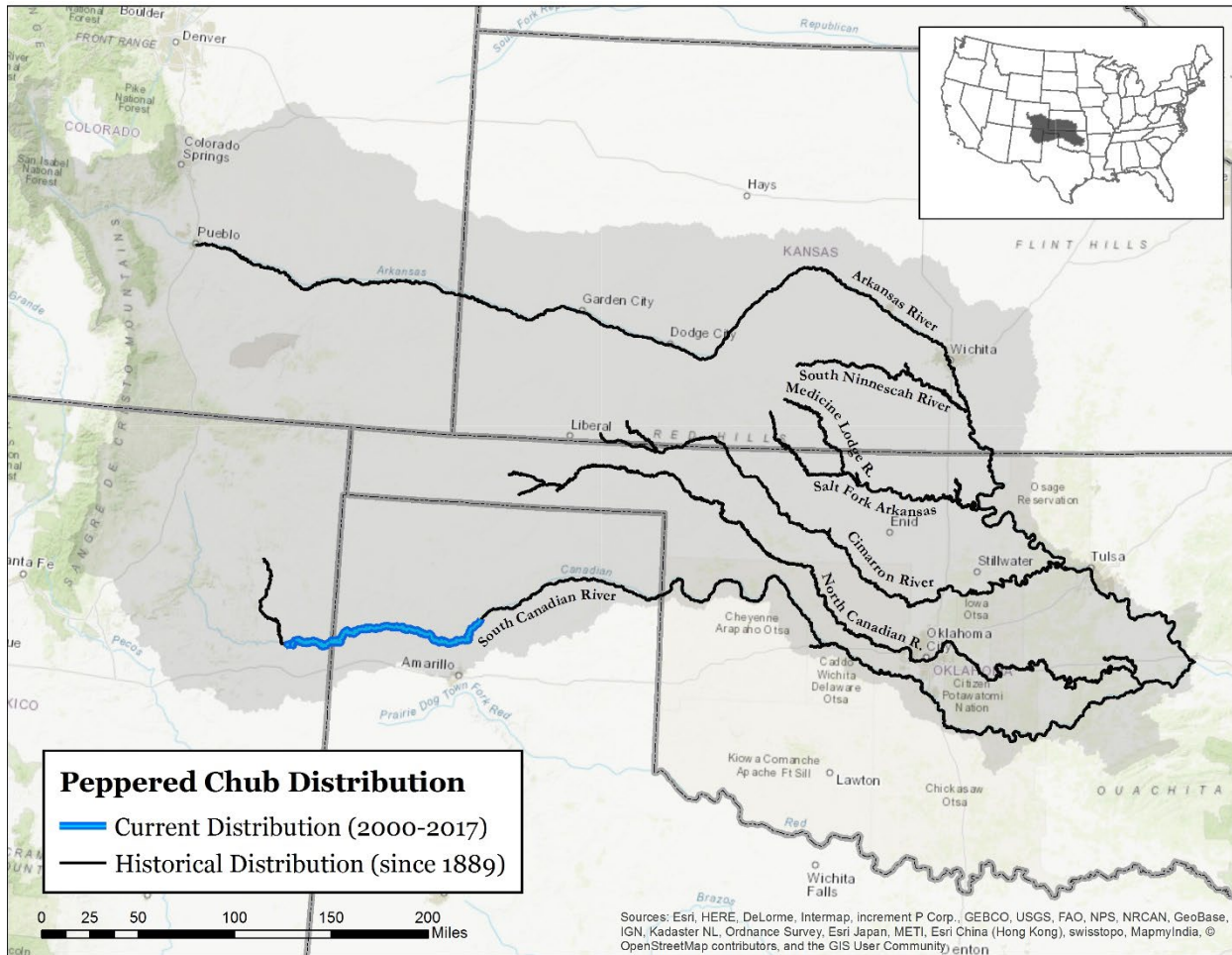
This memo documents the rationale behind the Determination Key for the endangered pepered chub (*Macrhybopsis tetranema*) within the Arlington, Texas Ecological Services' area of responsibility. This determination key is a logically structured set of questions to assist a user in determining whether a proposed project qualifies for a predetermined consultation outcome based on USFWS standing analysis. General biology and other information is included to support the standing analysis and key. This key is intended to be delivered through the USFWS' Information for Planning and Consultation (IPaC) web application.

The U.S. Fish and Wildlife Service (Service) published a final rule listing the pepered chub (PC) as endangered with designated critical habitat on February 28, 2022 (87 FR 11188). The PC is a small minnow with a fusiform (tapering at both ends) body shape rapidly tapering to a conical head. Mouth position is inferior and horizontal, with two distinct pairs of barbels present. Taste buds are present over most of the body. Pigment is nearly confined to the dorsal half of the body with dark spots scattered across this area. The lateral stripe is poorly defined and centered one scale row above lateral line. A comprehensive account of the species' resource needs, threats, current conditions, and projected future conditions can be found in the Species Status Assessment Report for the Arkansas River Shiner (*Notropis girardi*) and Pepered Chub (*Macrhybopsis tetranema*) (Service 2018).

### Distribution

The PC was once widespread and common in the western portion of the Arkansas River basin in Kansas, New Mexico, Oklahoma, and Texas, and has at least one historical detection in Colorado. This species has subsequently disappeared from 94 percent of its historical range and

is currently restricted to portions of the South Canadian River between Ute Reservoir in New Mexico and Lake Meredith in the Texas panhandle (170 river miles, Figure 1).



**Figure 1.** Peppered chub historical and current distribution map.

### Life History

The PC historically inhabited wide, shallow, sandy bottomed rivers and larger streams of the Arkansas River basin. Adult PCs prefer shallow channels where currents flow over clean fine sand (Cross & Collins 1995, p. 62; Collins et al. 1995, p. 45), avoid calm waters and silted stream bottoms. PCs are generalist feeders that feed aggressively to fuel rapid growth (Bottrell et al. 1964, p. 398). They feed primarily on larval insects, small crustaceans, immature aquatic insects, and plant material. PCs have evolved for feeding in highly turbid streams.

The PC broadcast spawns semibuoyant eggs, which are kept suspended until hatching in flowing water. Fertilized eggs develop as they drift in the current and hatch 25-28 hours after fertilization (Bottrell et al. 1964, p. 398). Research indicates that PCs require approximately 127 river miles (205 river kilometers) of unimpounded flow to complete their reproductive cycle (Perkin and Gido 2011, p. 374).

## **Reasons for Decline and Threats to Survival**

PC experienced a reduction in range and numbers due to habitat loss and modification, channelization, construction of impoundments, stream dewatering, diversion of surface water, groundwater pumping, and water quality degradation (USFWS 2018, p. 23-37). Impoundments and fragmentation of streams have altered the timing, duration, and magnitude of flows throughout the Arkansas River basin. Barriers to fish movement have contributed to local extirpations within the historical range.

## **Conservation Actions**

A focus on conserving the quantity and quality of water (ground and surface water) within the PC's range will be essential to recovering the species. Any efforts to conserve water will help to maintain essential flows for the species. Avoiding barriers to fish movement within the Canadian River is important to conservation. Additionally, maintaining riparian buffers promotes natural stream morphology and filters pollutants from entering the river. Control of invasive salt cedar, which affects water quantity and stream morphology, is an on-the-ground measure that benefits the species.

## **Critical Habitat**

Critical habitat was designated for the PC on February 28, 2022 (effective March 28, 2022) and includes 3 units in Oklahoma, New Mexico and Texas. Within the Arlington, Texas Ecological Services' area of responsibility, critical habitat includes two segments within the South Canadian River: 1) approximately 134 river miles from the New Mexico border downstream to Lake Meredith and 2) approximately 29 river miles from the Hwy 60/83 bridge near Canadian, Texas downstream to the Oklahoma border. Critical habitat includes only wetted channel river width, and in both segments extends beyond the Texas state border. These areas were designated as critical habitat because they provide the primary needs of peppered chub populations including a minimum, unobstructed, wide, flat, flowing river segment necessary to support development of their life history stages.

### Peppered Chub Critical Habitat Physical or Biological Features

The physical or biological features and habitat characteristics required to sustain the PC life-history processes consists of a riverine system with habitat to support all life stages of PC, which includes:

- (1) Unobstructed river segments greater than 127 river miles (205 river kilometers) in length that are characterized by a complex braided channel and substrates of predominantly sand, with some patches of silt, gravel, and cobble.
- (2) Flowing water with adequate depths to support all life stages and episodes of elevated discharge to facilitate successful reproduction, channel and floodplain maintenance, and sediment transportation.
- (3) Water of sufficient quality to support survival and reproduction, which includes, but is

not limited to, the following conditions:

- (i) Water temperatures generally less than 98.2 degrees Fahrenheit (°F) (36.8 degrees Celsius (°C));
  - (ii) Dissolved oxygen concentrations generally greater than 3.7 parts per million (ppm);
  - (iii) Conductivity generally less than 16.2 millisiemens per centimeter (mS/cm);
  - (iv) pH generally ranging from 5.6 to 9.0; and
  - (v) Sufficiently low petroleum and other pollutant concentrations such that reproduction and/or growth is not impaired.
- (4) Native riparian vegetation capable of maintaining river water quality, providing a terrestrial prey base, and maintaining a healthy riparian ecosystem.
- (5) A level of predatory or competitive, native or nonnative fish present such that peppered chub population's resiliency is not affected.

**Key for evaluating potential impacts to the PC within the ARLES area of responsibility.**

If the project is found to intersect PC AOI Range [hidden semantic], the Key is as follows:

- A. Is this a reservoir project, interbasin transfer, water diversion, small impoundment, industrial/commercial/municipal/agricultural water well field, or other in-channel project?
  - a. Yes..... *go to F*
  - b. No..... *go to B*
- B. Does the project intersect the Canadian River or adjacent riparian area? [hidden semantic]
  - a. Yes..... *Go to F*
  - b. No..... *Go to C*
- C. Will the project involve industrial wastewater, treatment of water by reverse osmosis, or the discharge of  $\geq 1$  million gallons of municipal wastewater per day?
  - a. Yes..... *Go to F*
  - b. No..... *Go to D*
- D. Does the project require a permit be obtained from the Texas Commission on Environmental Quality (TCEQ)?
  - a. Yes.....*Go to F*
  - b. No.....*Go to E*
- E. Would the proposed action be expected to have any effects on the PC or the Canadian River?
  - a. Yes.....*Go to F*
  - b. No.....*No effect.*
- F. Has a biological evaluation to determine effects to the PC been conducted?
  - a. Yes.....*Submit biological evaluation to field office*
  - b. No.....*May affect, Conduct biological evaluation and submit to field office*

END KEY

## Literature Cited

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