

**NEW MEXICO DEPARTMENT OF GAME AND FISH  
NATIVE FISH CONSERVATION EFFORTS: 2021**

Annual Report



**Submitted to**

Bureau of Reclamation  
Gila River Basin Native Fishes Conservation Program

**From**

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Cooperative Agreement (R21AC10115)

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## EXECUTIVE SUMMARY

This report summarizes the Gila River Basin Native Fishes Conservation Program (GRBNFCP) tasks funded for native fish conservation in New Mexico in 2021. Work in 2021 was conducted under a Cooperative Agreement (21AC10115) between the Bureau of Reclamation (BOR) and the New Mexico Department of Game and Fish (Department). Four ongoing native fish conservation efforts were conducted in 2021: (1) removal of nonnative fishes from the West Fork Gila River, (2) Threatened and Endangered (T&E) fish repatriations and monitoring, (3) remote site inventory, and (4) permanent site monitoring in the Gila River Basin. The West Fork Gila River nonnative removal was completed in June 2021. Six nonnative species were captured and removed. Surveys were conducted to assess the success of repatriation of Loach Minnow *Tiaroga cobitis* in Saliz Canyon. Negrito Creek was surveyed for Loach Minnow and any potential habitat for other priority species. Sites on West Fork Gila River were surveyed, partially completing the West Fork Gila River remote site inventory. Specific details of work completed and results for each native fish conservation task are included within this report.

## INTRODUCTION

The GRBNFCP was established to minimize effects on threatened and endangered fishes by the Central Arizona Project (CAP). The United States Fish and Wildlife Service (USFWS) biological opinions in 1994, 2001, and 2008 concluded that operation of the CAP required mitigation for the negative effects on federally listed fish species within the entire Gila River Basin. The GRBNFCP is focused on conservation work for federally listed Gila Chub *Gila intermedia* (now classified as Roundtail Chub *Gila robusta*), Gila Topminnow *Poeciliopsis occidentalis*, Loach Minnow *Tiaroga cobitis*, Razorback Sucker *Xyrauchen texanus*, and Spikedace *Meda fulgida*. In the most recent GRBNFCP Strategic Plan (USFWS et al. 2018), the principal goals are described as: (1) achieve enhanced conservation status of federally-listed and candidate fish species in the Gila River basin, and (2) alleviate and diminish threats from nonnative aquatic species that might enter the Gila River basin via the CAP canal or other pathways. The program is funded by the BOR and is directed by the USFWS and BOR in cooperation with the Department and the Arizona Game and Fish Department (AZGFD). The Department receives funds from the BOR for work fitting these objectives under a Cooperative Agreement (21AC10115 from 2021 to 2025). The Department prepares an annual report for the GRBNFCP which describes the results of the native fish conservation efforts funded during the preceding calendar year. Most New Mexico native fish conservation tasks are completed through a collaborative effort between the Department, the USFWS, and the United States Forest Service (USFS).

For each task funded in 2021, this report lists the GRBNFCP Strategic Plan goal(s) the task works toward achieving (USFWS et al. 2018), followed by associated recovery objective(s) listed in the Loach Minnow and Spikedace Recovery Plans (USFWS 1991, 1991) and the Gila Chub and Gila Topminnow Draft Recovery Plans (USFWS 1999, 2015). Work performed by the Department in 2021 is presented under each task. For each task, a background of the work is included followed by results, recommendations for the future, and work planned for 2022.

## REMOVAL OF NONNATIVE FISHES FROM WEST FORK GILA RIVER (TASK NM-2006-1)

### Strategic Plan Goals

- Prevent extinction and manage toward recovery
  - Goal 3. Protect native fish populations from nonnative fish invasions.
  - Goal 4. Remove nonnative aquatic species threats.
  - Goal 9. Monitor to quantitatively measure and evaluate project success in improving the status of target species and their habitats.
  - Goal 10. Maintain accurate Program tracking records.

### Recovery Objectives

- Loach Minnow Recovery Plan (1991)
  - Task 2.5 (priority 1): Monitor community composition including range of natural variation
  - Task 3.1-2 (priority 2): Identify nature and significance of interaction with nonnative fishes
- Spikedace Recovery Plan (1991)
  - Task 2.5 (priority 1): Monitor community composition including range of natural variation
  - Task 3.1-2 (priority 2): Identify nature and significance of interaction with nonnative fishes

### Background

The West Fork Gila River supports an intact native fish assemblage including federally endangered Spikedace and Loach Minnow as well as state endangered Roundtail Chub (previously known as Headwater Chub *Gila nigra*). In addition, federally threatened Gila Trout *Oncorhynchus gilae* are stocked in cooler months to provide recreational fishing opportunities and support recovery efforts. Ten species of nonnative fishes have been documented in the river including Brown Trout *Salmo trutta*, Rainbow Trout *Oncorhynchus mykiss*, Smallmouth Bass *Micropterus dolomieu*, and Yellow Bullhead *Ameiurus natalis*. The Department and partners have been removing nonnative fishes from an approximately 4 km reach of the West Fork Gila River at the Department-owned Heart Bar Wildlife Management Area since 2006. This reach lies in the vicinity of the confluence of the Middle and West Forks of the Gila River, an area also commonly referred to as “The Forks” (Figure 1). Nonnatives are removed from the Little Creek confluence upstream to the NM15 Bridge. The removal effort consists of a single pass of sampling by individual mesohabitat. Pools and runs are electrofished with two shockers simultaneously, riffles are electrofished and kicknetted into a seine, and sandy shoals are seined. Fish and habitat data collected during this removal effort included species, effort (seconds), habitat type, and area (m<sup>2</sup>) sampled. Total length (to the nearest mm) and weight (to the nearest gram) are collected for the first 50 individuals of each species captured each day. After 50 lengths and weights have been recorded the remaining small-bodied fish are enumerated by species and the total length of all large-bodied fish species is recorded. The removal is conducted annually in June, requires a crew of 6 to 9 people, and usually takes 4 to 5 days to complete. The same stretch of river is sampled annually. However, the river has changed considerably since the project began in 2006, including a major shift of the river channel and high variability in the number of braided channels encountered year to year. Propst et al. (2014) evaluated this effort using data from 2007 to 2012. Results suggested that this effort reduced biomass of some

nonnative species and increased Spikedace biomass. The GRBNFCP decided to continue the effort because of the documented reduction of nonnative species.

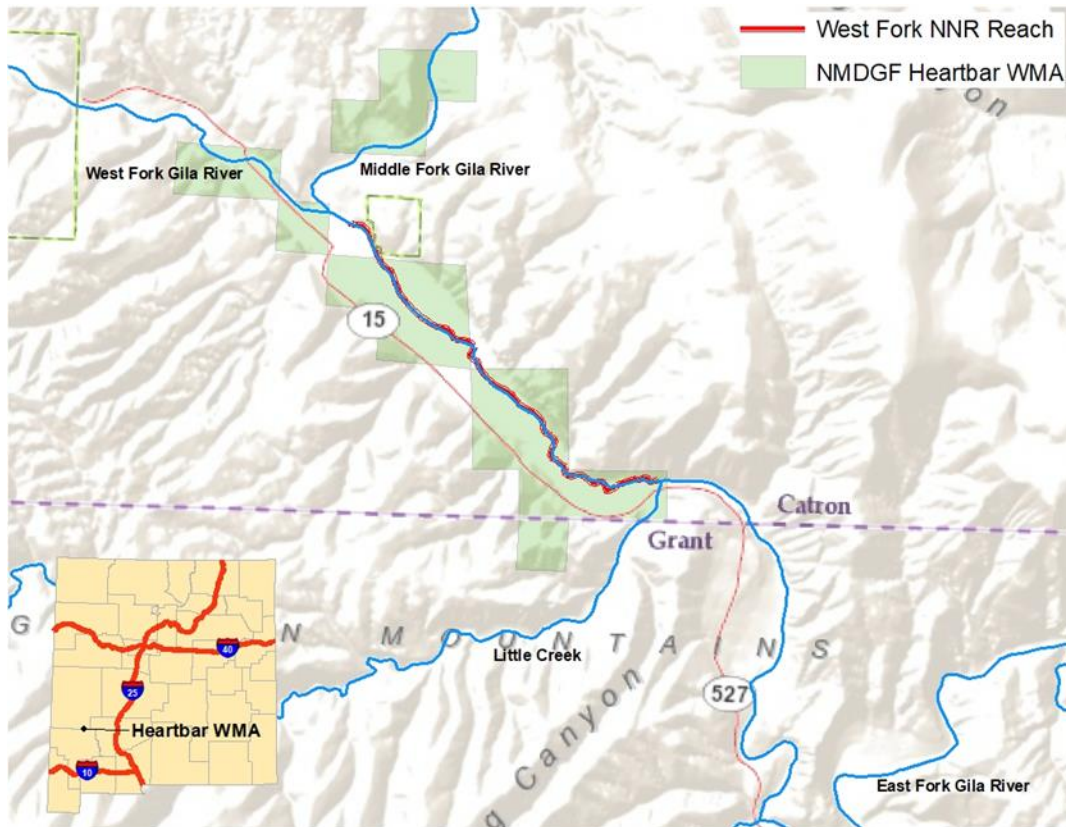


Figure 1. Map showing the location of the West Fork Gila River nonnative fish removal.

## Results

Department, USFWS, and USFS staff conducted the West Fork Gila River nonnative removal from June 7 – 11, 2021. Total area sampled was 22,970 m<sup>2</sup>. Sonora Sucker *Catostomus insignis*, Desert Sucker *Catostomus clarkii*, Loach Minnow *Tiaroga cobitis*, and Longfin Dace *Agosia chrysogaster* were the most abundant native species (Table 1). Bullhead species *Ameiurus* spp. were the most abundant nonnatives species captured. Roundtail Chub *Gila robusta* have increased in density over the last two years after remaining at a low density for several years (Figure 2). Over the last three years, Loach Minnow density has been steadily increasing. Bullhead species were the most abundant nonnative species captured and their density remains high compared to earlier years (Figure 3).

Table 1. Total number of fish captured, percent composition, and density of all fishes captured in the West Fork Gila River during nonnative removal efforts in 2021.

|           | Species                  | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|-----------|--------------------------|---------------|---------------------|------------------------------------|
| Native    |                          |               |                     |                                    |
|           | Desert Sucker            | 882           | 21.34               | 3.84                               |
|           | Gila Trout               | 3             | 0.07                | 0.01                               |
|           | Loach Minnow             | 590           | 14.28               | 2.57                               |
|           | Longfin Dace             | 550           | 13.31               | 2.39                               |
|           | Roundtail Chub           | 70            | 1.69                | 0.30                               |
|           | Sonora Sucker            | 1534          | 37.12               | 6.68                               |
|           | Speckled Dace            | 107           | 2.59                | 0.47                               |
|           | Spikedace                | 150           | 3.63                | 0.65                               |
| Nonnative |                          |               |                     |                                    |
|           | Brown Trout              | 3             | 0.07                | 0.01                               |
|           | Bullhead species         | 107           | 2.59                | 0.47                               |
|           | Common Carp              | 1             | 0.02                | 0.00                               |
|           | <i>Oncorhynchus</i> spp. | 1             | 0.02                | 0.00                               |
|           | Smallmouth Bass          | 56            | 1.35                | 0.24                               |
|           | Western Mosquitofish     | 79            | 1.91                | 0.34                               |

Table 2. Area sampled and percent composition of all habitat types sampled on the West Fork Gila during nonnative removal in 2021.

| Habitat Type  | Area Sampled (m <sup>2</sup> ) | Percent Composition |
|---------------|--------------------------------|---------------------|
| Pool          | 8159                           | 35.52               |
| Riffle        | 2172                           | 9.46                |
| Run           | 11996                          | 52.23               |
| Shoal         | 550                            | 2.39                |
| Zero Velocity | 93                             | 0.41                |

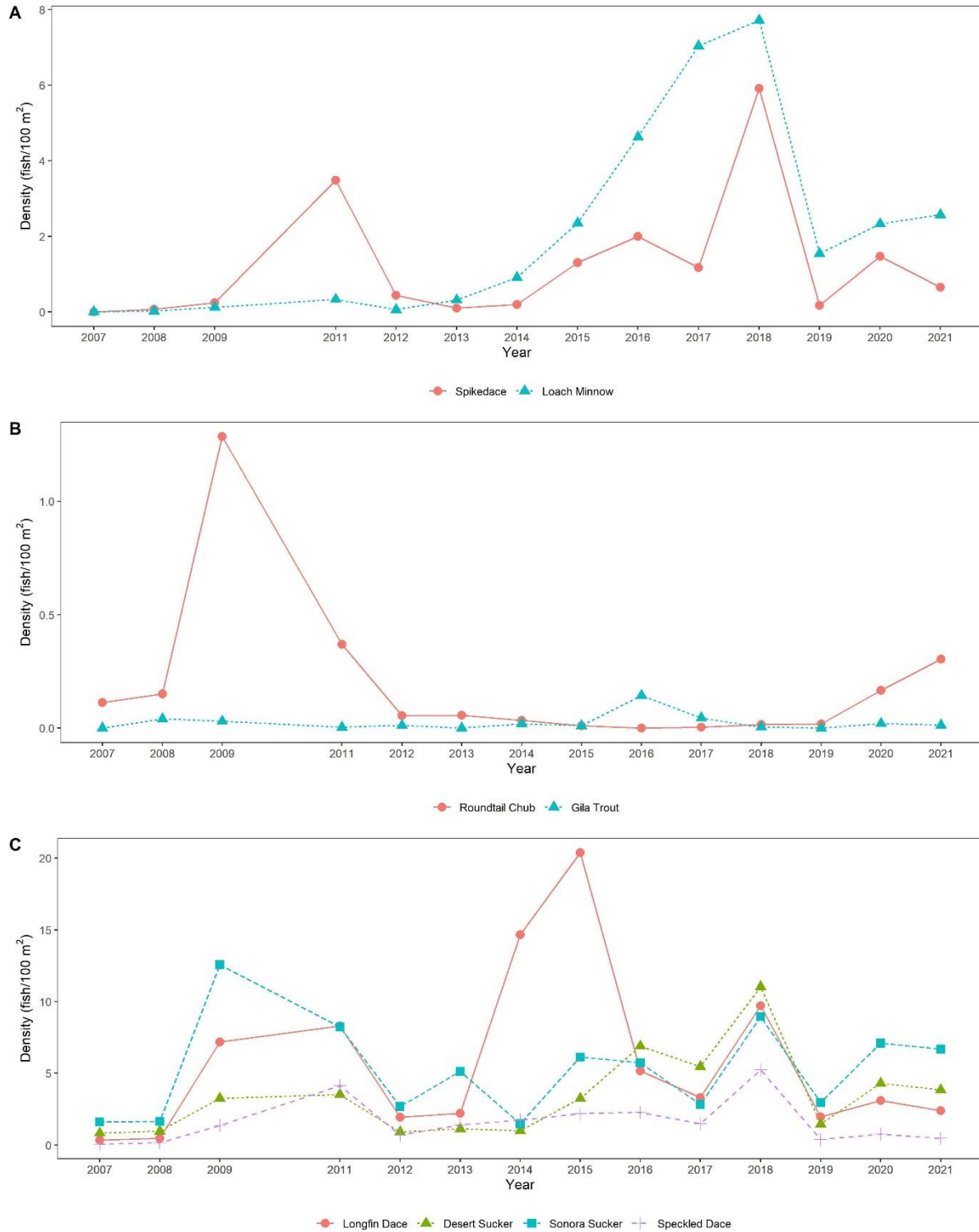


Figure 2. Density of native fish species captured in the West Fork Gila River nonnative removal from 2007 to 2021. Data from 2006 and 2010 are excluded because habitat measurements were not recorded. For clarity, charts are split into priority species (A), low density species (B), and all other native fish species (C).

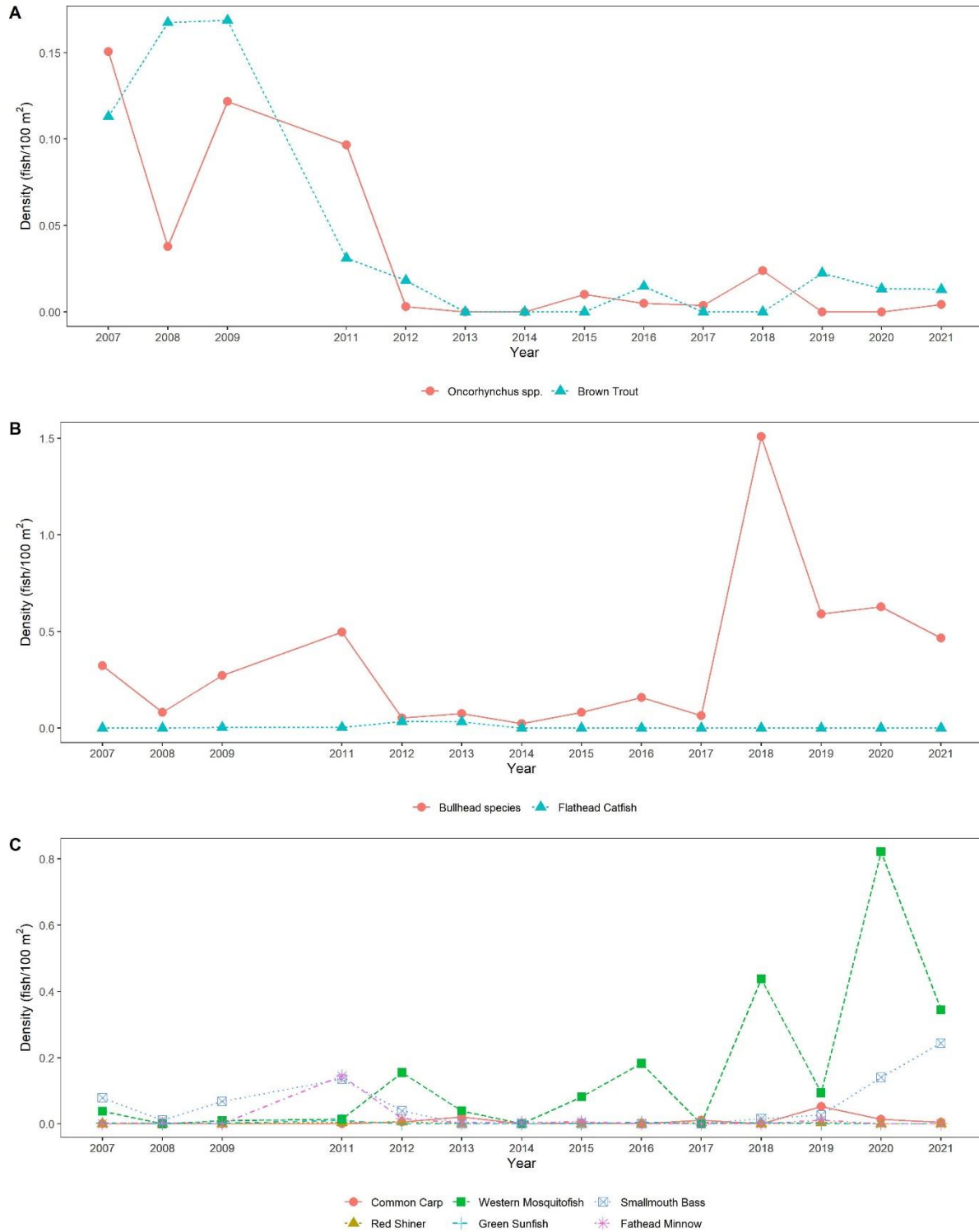


Figure 3. Density of nonnative fish species captured in the West Fork Gila River nonnative removal from 2007 to 2021. Data from 2006 and 2010 are excluded because habitat measurements were not recorded. For clarity, charts are split into salmonid species (A), catfish and bullhead species (B), and all other nonnative fish species (C).

**Recommendations**

- In order to reduce nonnatives and potentially benefit the native fishes with nonnative suppression, we recommend continuing nonnative removal efforts on the West Fork Gila River. A single pass should continue to be completed until evidence suggests that additional effort is needed.

**Work Planned for 2022**

- Conduct West Fork Gila River nonnative removal on 4 km Heart Bar Wildlife Management Area reach in June 2022.



## NEW MEXICO T&E FISH REPATRIATIONS AND MONITORING (TASK NM-2002-1)

### Strategic Plan Goals:

- Prevent extinction and manage toward recovery
  - Goal 1. Identify critical streams and populations in need of protection and potential replication.
  - Goal 2. Maintain and operate ASU topminnow holding facility and the Aquatic Research and Conservation Center (ARCC) to support the Program's recovery efforts for imperiled fishes in the Gila River Basin through the establishment of refuge populations of genetically distinctive stocks as insurance against extinction in the wild, captive propagation for repatriation, and applied research.
  - Goal 5. Replicate populations and their associated native fish community into protected streams and other surface waters.
  - Goal 9. Monitor to quantitatively measure and evaluate project success in improving the status of species and their habitats.
  - Goal 10. Maintain accurate Program tracking records.

### Recovery Objectives

- Loach Minnow Recovery Plan (1991)
  - Task 6.2 (priority 3): Identify and prepare sites for reintroduction
  - Task 6.3-4 (priority 3): Reintroduce into selected reaches and monitor
  - Task 6.5-6 (priority 3): Determine reasons for success/failure and rectify as necessary
  - Task 8.2 (priority 3): Collect hatchery stocks
- Spikedace Recovery Plan (1991)
  - Task 6.2 (priority 3): Identify and prepare sites for reintroduction
  - Task 6.3-4 (priority 3): Reintroduce into selected reaches and monitor
  - Task 6.5-6 (priority 3): Determine reasons for success/failure and rectify as necessary
  - Task 8.2 (priority 3): Collect hatchery stocks

### Background

This task is used to identify potential repatriation streams, evaluate potential donor populations and repatriation sites, conduct repatriation to identified streams, monitor populations post-repatriation, and supplement hatchery populations as needed. Repatriations consist of multiple stockings into each repatriation stream successively for 3 to 5 years or until monitoring of the streams determines the populations are established or considered unsustainable. Established streams are then surveyed at least once every five years. It is an ongoing effort to find and evaluate new waters where repatriation may be possible. This task encompasses all New Mexico streams within the Gila River basin where repatriation might occur. Repatriation stockings can be direct transfers of fish from a wild population or stocking from a hatchery such as ARCC. This task is also used for collecting live fish for the purposes of direct stocking, quarantine at ARCC, or development and maintenance of brood stock at ARCC.

### Results

Several ongoing repatriation projects were continued in 2021, including post-repatriation surveys and fish collection.

*Bear Creek*

The Tadpole Fire burned the headwaters of Bear Creek in 2020. To mitigate the potential for negative effects from the fire, 221 Loach Minnow were salvaged from Bear Creek on July 7, 2020 and transferred to ARCC. Loach Minnow will be restocked into Bear Creek when habitat is suitable. Department and USFWS staff surveyed Bear Creek on May 18, 2021 to determine the upstream extent of Loach Minnow on the Department's Double E Wildlife Management Area. One Loach Minnow was captured along with other native fishes (Table 3). Observations during the survey indicated that habitat in the upstream reaches on the Department's property are limiting due to stream intermittency.

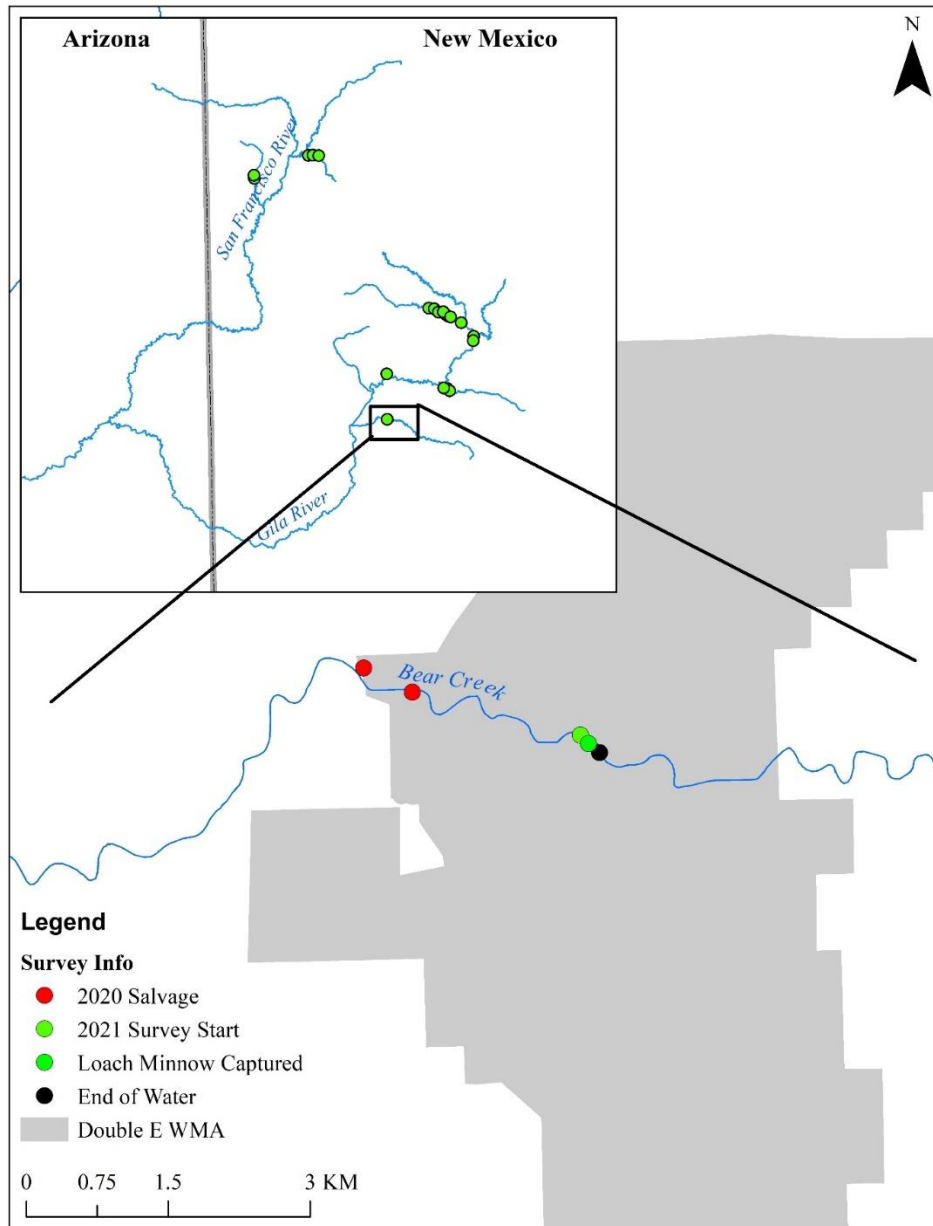


Figure 4. Location of Loach Minnow salvage in 2020 and Loach Minnow survey conducted in 2021 in Bear Creek.

Table 3. Total number of fish captured, percent composition, and density in Bear Creek in 2021.

| Species       | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|---------------|---------------|---------------------|------------------------------------|
| Desert Sucker | 90            | 28.48               | 53.57                              |
| Loach Minnow  | 1             | 0.32                | 0.60                               |
| Longfin Dace  | 216           | 68.35               | 128.57                             |
| Sonora Sucker | 9             | 2.85                | 5.36                               |

#### *Harden Cienega Tanks*

Department personnel surveyed several stock tanks in the headwaters of Harden Cienega along with personnel from Arizona Game and Fish on July 13 and 14, 2021. Results from the surveys are reported in the Arizona Game and Fish 2021 report. Additional surveys of stock tanks that were not visited in 2021 are planned for 2022.

#### *Negrito Creek*

Department and USFWS staff surveyed Negrito Creek on May 20, 2021. Negrito Creek is a tributary to the Tularosa River in the San Francisco River drainage. Access is difficult due to private land located at the mouth of Negrito Creek. Staff opportunistically surveyed possible Loach Minnow habitat and only recorded species observed. No Loach Minnow or Spikedace were captured in 3,137 seconds of electrofishing but Desert Sucker, Longfin Dace, Sonora Sucker, and Speckled Dace *Rhinichthys osculus* were captured (Table 4). However, in 2020 Department and USFS staff opportunistically surveyed possible Loach Minnow habitat in Negrito Creek and captured one loach minnow in 816 seconds of electrofishing. This past survey confirmed presence of Loach Minnow in Negrito Creek, however future surveys need to be conducted to confirm long-term presence and to determine distribution and abundance.

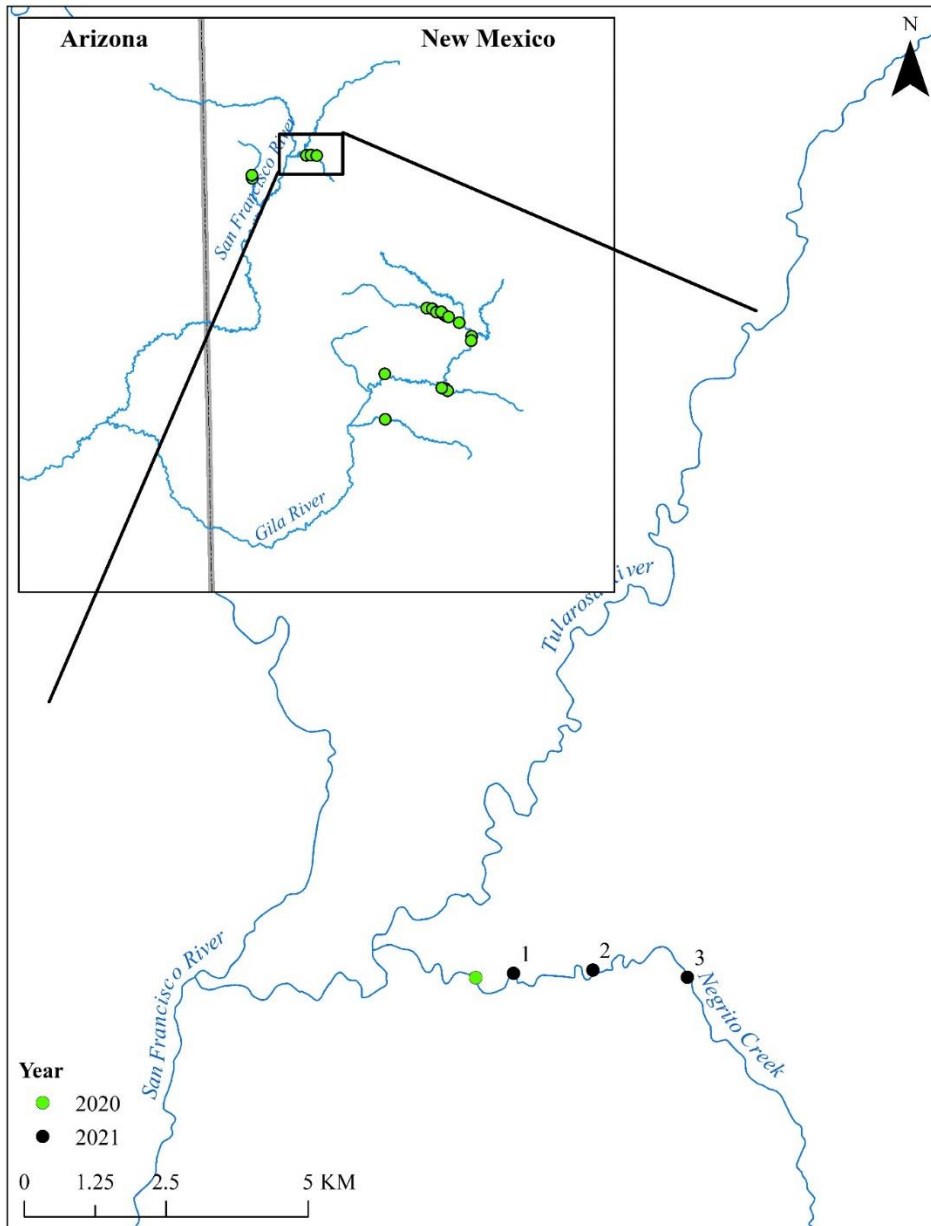


Figure 5. Location of sites sampled in Negrito Creek in 2020 and 2021. Note that Loach Minnow were only captured in 2020.

Table 4. Total number of fish captured, percent composition, and catch per unit effort (CPUE) in Negrito Creek in 2021.

| Species       | Number Caught | Percent Composition | CPUE (fish/hour) |
|---------------|---------------|---------------------|------------------|
| Desert Sucker | 158           | 35.27               | 181.32           |
| Longfin Dace  | 51            | 11.38               | 58.53            |
| Sonora Sucker | 70            | 15.63               | 80.33            |
| Speckled Dace | 169           | 37.72               | 193.94           |

*Saliz Canyon*

Stocking of Loach Minnow into Saliz Canyon began in 2016 (Table 5). Stocking was postponed in 2018 due to habitat degradation resulting from the Owl Fire (Ferguson and Wick 2019). In June 2019, Department and USFWS staff visually assessed the stocking reach of Saliz Canyon. Suitable habitat was found, the substrate was less embedded than in 2018, and other fish species appeared to have recovered. Loach Minnow stocking resumed in 2019. Department and USFWS staff conducted surveys in Saliz Canyon on May 17 and 19, 2021. Ten Loach Minnow (37 – 64 mm TL) were captured at the stocking location, however none were captured at an upstream site. The capture of Loach Minnow less than 40 mm TL in 2021 and 2020 indicate that stocked fish have successfully reproduced in Saliz Canyon (Ferguson and Zeigler 2021). Stocking efforts appear to have established Loach Minnow in Saliz Canyon but the repatriated population appears to be spatially limited. Additional access locations for new repatriation and monitoring efforts should be assessed.

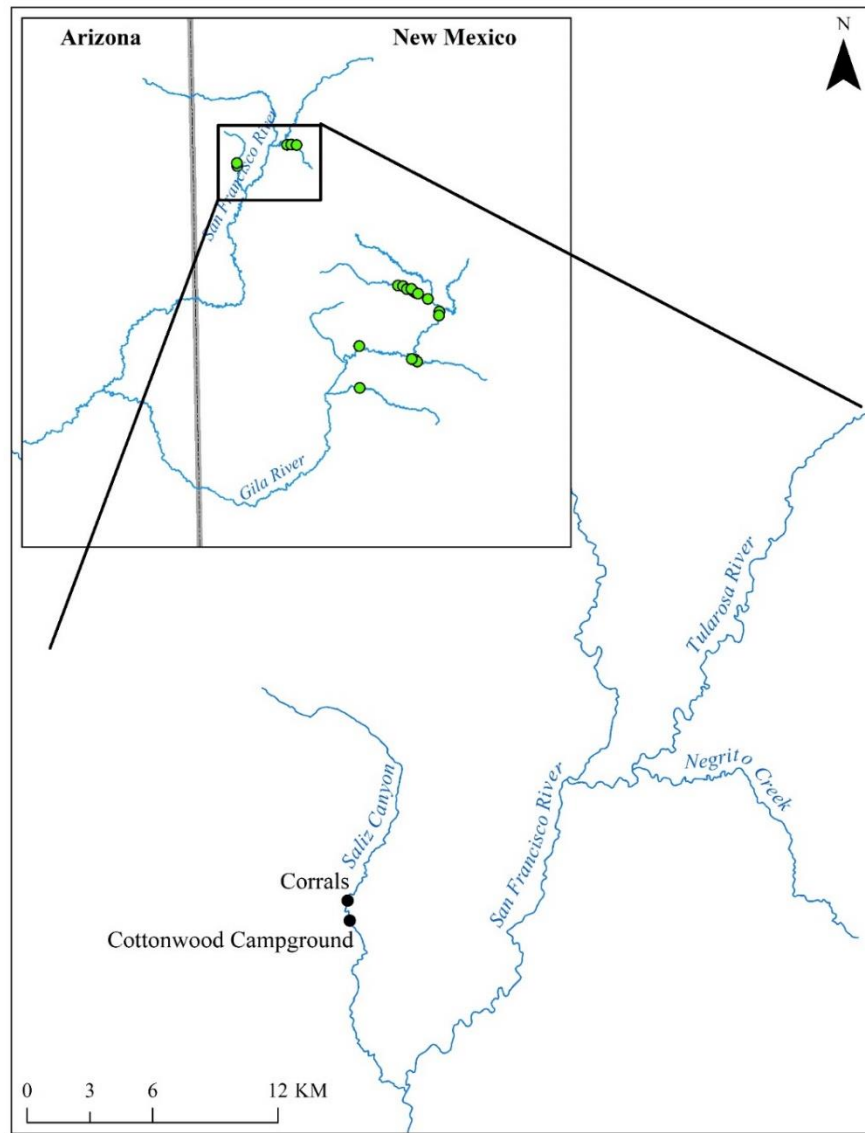


Figure 6. Location of sites sampled in Saliz Canyon in 2021.

Table 5. Summary of Loach Minnow stocking into Saliz Canyon.

| Date              | Number Stocked | Source (population)  |
|-------------------|----------------|----------------------|
| November 16, 2016 | 103            | Tularosa River       |
| November 29, 2017 | 243            | ARCC (San Francisco) |
| June 3, 2019      | 305            | ARCC (San Francisco) |

Table 6. Number of fish captured, percent composition, and density in Saliz Canyon at Cottonwood Campground in 2021.

| Species       | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|---------------|---------------|---------------------|------------------------------------|
| Desert Sucker | 14            | 1.31                | 6.65                               |
| Loach Minnow  | 10            | 0.93                | 4.75                               |
| Longfin Dace  | 461           | 43.04               | 219.11                             |
| Speckled Dace | 586           | 54.72               | 278.52                             |

Table 7. Number of fish captured, percent composition, and density in Saliz Canyon at Corrals in 2021.

| Species       | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|---------------|---------------|---------------------|------------------------------------|
| Desert Sucker | 33            | 4.51                | 42.62                              |
| Loach Minnow  | 0             | 0.00                | 0.00                               |
| Longfin Dace  | 569           | 77.84               | 734.81                             |
| Speckled Dace | 129           | 17.65               | 166.59                             |

#### *Sapillo Creek*

Department and USFS staff surveyed Sapillo Creek on May 11 – 13, 2021. Native and nonnative fishes were captured in the creek (Figure 8). Only native species (Longfin Dace and Speckled Dace) were captured at Site 1, the most upstream site, and at Site 2 (Table 8). Downstream at Site 3 and the site located in the Gila River at the mouth of Sapillo Creek, both native species and nonnative species were captured. Density could not be calculated for the Gila River site because area sampled was not measured. Although large predatory nonnatives such as Flathead Catfish *Pylodictis olivaris* and Smallmouth Bass were not captured in Sapillo Creek, they were present in the Gila River at their confluence. Habitat appears suitable for both Loach Minnow and Spikedace, and both species should be repatriated to the stream to establish populations while nonnative densities remain low.

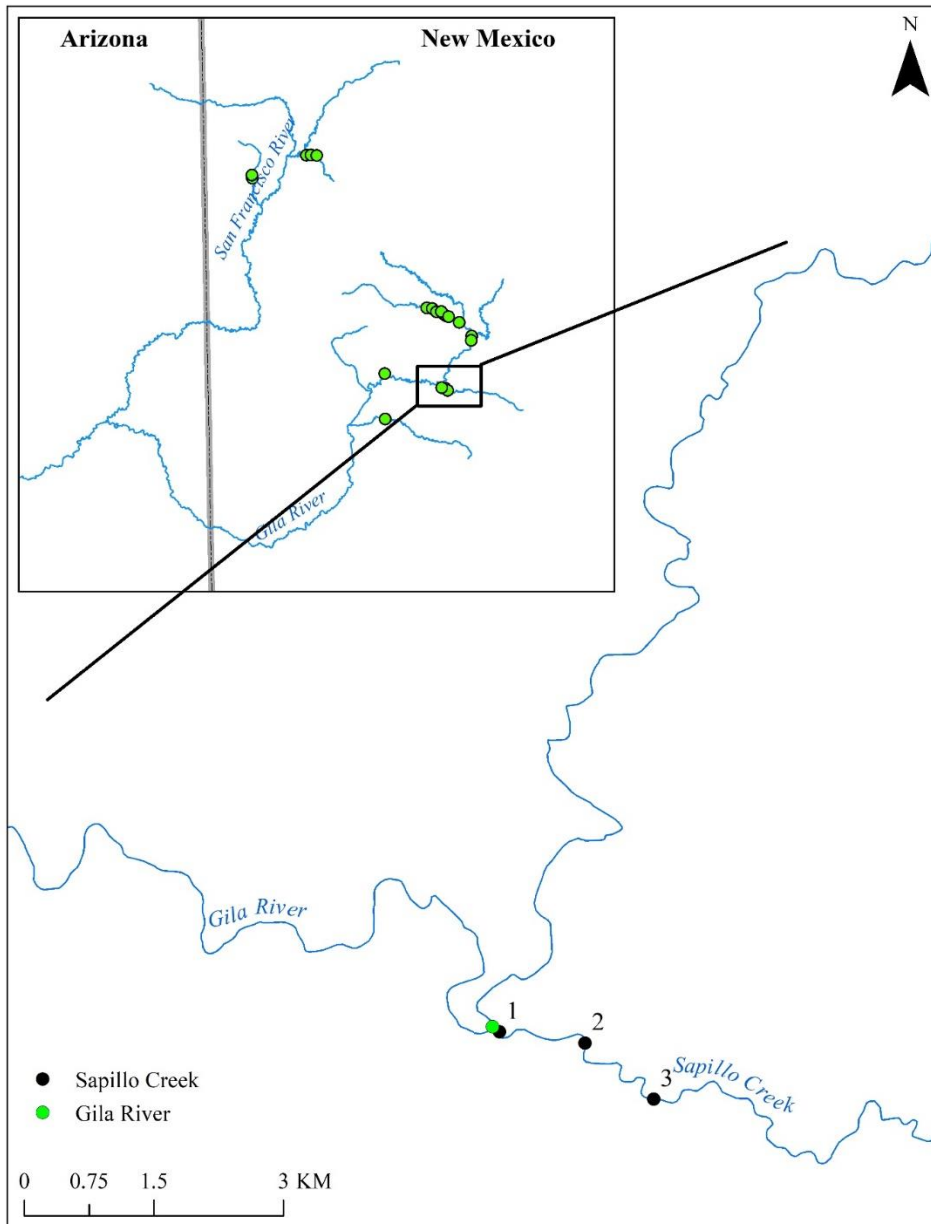


Figure 7. Location of sites sampled in Sapillo Creek and in the Gila River at the mouth of Sapillo Creek in 2021.

Table 8. Number (N), percent composition (%), and density (fish/100m<sup>2</sup>) or catch per unit effort (CPUE, fish/hr) of fish captured at three sites sampled in Sapillo Creek and one site sampled in the Gila River at the mouth of Sapillo Creek in 2021.

| Species           | Site 1 |                                    | Site 2 |                                    | Site 3 |                                    | Gila River at mouth of Sapillo |                |
|-------------------|--------|------------------------------------|--------|------------------------------------|--------|------------------------------------|--------------------------------|----------------|
|                   | N      | Density (fish/100 m <sup>2</sup> ) | N      | Density (fish/100 m <sup>2</sup> ) | N      | Density (fish/100 m <sup>2</sup> ) | N                              | CPUE (fish/hr) |
| Native            |        |                                    |        |                                    |        |                                    |                                |                |
| Desert Sucker     | 0      | 0                                  | 3      | 0.85                               | 2      | 0.26                               | 1                              | 5.43           |
| Longfin Dace      | 32     | 7.36                               | 0      | 0                                  | 13     | 5.62                               | 0                              | 0.00           |
| Rio Grande Sucker | 0      | 0                                  | 1      | 0.11                               | 0      | 0                                  | 0                              | 0              |
| Sonora Sucker     | 0      | 0                                  | 6      | 1.15                               | 13     | 3.92                               | 0                              | 0.00           |
| Speckled Dace     | 11     | 1.55                               | 0      | 0                                  | 1      | 0.77                               | 0                              | 0.00           |
| Nonnative         |        |                                    |        |                                    |        |                                    |                                |                |
| Channel Catfish   | 0      | 0                                  | 0      | 0                                  | 0      | 0                                  | 1                              | 27.15          |
| Flathead Catfish  | 0      | 0                                  | 0      | 0                                  | 0      | 0                                  | 5                              | 5.43           |
| Red Shiner        | 0      | 0                                  | 0      | 0                                  | 1      | 0.43                               | 0                              | 0.00           |
| Smallmouth Bass   | 0      | 0                                  | 0      | 0                                  | 0      | 0                                  | 1                              | 5.43           |



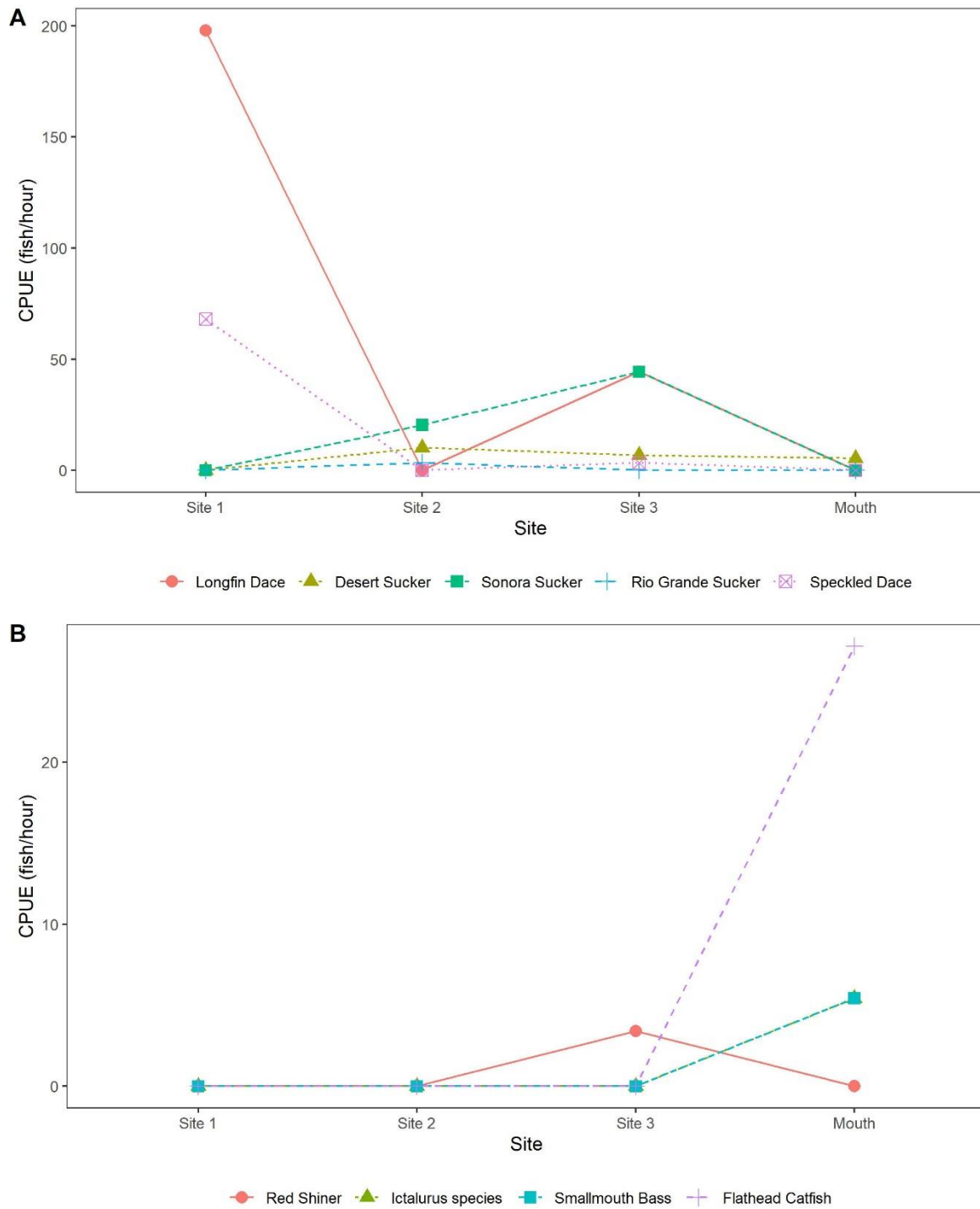


Figure 8. Catch per unit effort (CPUE, fish/hr) of fish captured during Sapillo Creek surveys in 2021. Data are presented as CPUE because habitat measurements were not recorded at the Gila River site at the mouth of Sapillo Creek (Mouth). For clarity, charts are split into native fish species (A), and nonnative fish species (B).

### **Recommendations**

- Negrito Creek does not appear suitable for the repatriation of Spikedace because of stream drying and Loach Minnow appear to already be present in the creek based on 2020 surveys. Tributaries to Negrito Creek should be investigated for potential reintroduction sites.
- Surveys in Saliz Canyon should continue for one more year and be expanded to additional sites to assess presence or dispersal if Loach Minnow continue to persist. Additional repatriation sites should also be assessed.
- Sapillo Creek should be considered as a future repatriation site for Loach Minnow and Spikedace.

### **Work Planned for 2022**

- Investigate additional access points in Saliz Canyon for monitoring and repatriation of Loach Minnow.
- Survey Negrito Creek tributaries for potential repatriation of Loach Minnow and Spikedace.
- Repatriate Loach Minnow and Spikedace to Sapillo Creek.
- Continue assessment of tanks in the Harden Cienega Creek drainage in New Mexico for nonnative fish with AZGFD. Develop plans for removal of nonnative fish in tanks within the Harden Cienega Creek drainage.

## REMOTE SITE INVENTORY AND ASSESSMENT (TASK NM-2017-1)

### Strategic Plan Goals:

- Prevent extinction and manage toward recovery
  - Goal 1. Identify critical streams and populations in need of protection and potential replication.
  - Goal 9. Monitor to quantitatively measure and evaluate project success in improving the status of target species and their habitats.
  - Goal 10. Maintain accurate Program tracking records.

### Recovery Objectives

- Loach Minnow Recovery Plan (1991)
  - Task 1.1 (priority 1): Identify all populations and determine level of protection
  - Task 2.5 (priority 1): Monitor community composition including range of natural variation
  - Task 3.1-2 (priority 2): Identify nature and significance of interaction with nonnative fishes
  - Task 6.2 (priority 3): Identify and prepare sites for reintroduction
- Spikedace Recovery Plan (1991)
  - Task 1.1 (priority 1): Identify all populations and determine level of protection
  - Task 2.5 (priority 1): Monitor community composition including range of natural variation
  - Task 3.1-2 (priority 2): Identify nature and significance of interaction with nonnative fishes
  - Task 6.2 (priority 3): Identify and prepare sites for reintroduction

### Background

Much of the Gila River Basin in New Mexico is extremely remote and thus difficult to sample. The distribution of priority and nonnative species in the remote sections of the Gila River and its forks were last surveyed in the mid-2000s and Department records indicate that the remote lower canyons of the San Francisco River have never been surveyed. The system is dynamic and there have been significant changes in the basin in recent years. Remote surveys in the middle and east forks of the Gila River have been completed with funding from GRBNFCP. The lower Middle Fork Gila River was surveyed in the summer 2017 and the upper reaches were surveyed in the summer 2018. The East Fork Gila River and tributaries, excluding Black Canyon Creek were surveyed in 2019. Black Canyon Creek was surveyed in 2020 and the lower West Fork Gila River was surveyed in 2021. The upper West Fork Gila is scheduled to be surveyed in 2022. This is an ongoing project with plans to monitor at least one remote site location per year until the assessment is complete, and then update status approximately every ten years.

### Results

The remote sites of the West Fork Gila River were last sampled in 2006 and 2007. On May 25 – 27 and June 8, 2021, Department, USFWS, and USFS staff sampled the lower portion of this group of sites. Upper sites were scheduled to be sampled but were postponed due to the Johnson Fire. Loach Minnow, Roundtail Chub, and Spikedace were present during sampling (Table 9). Nonnative fish species captured included Brown Trout, Common Carp *Cyprinus carpio*, Flathead Catfish, *Oncorhynchus* spp., Smallmouth Bass, Yellow Bullhead, and Western Mosquitofish *Gambusia affinis*.

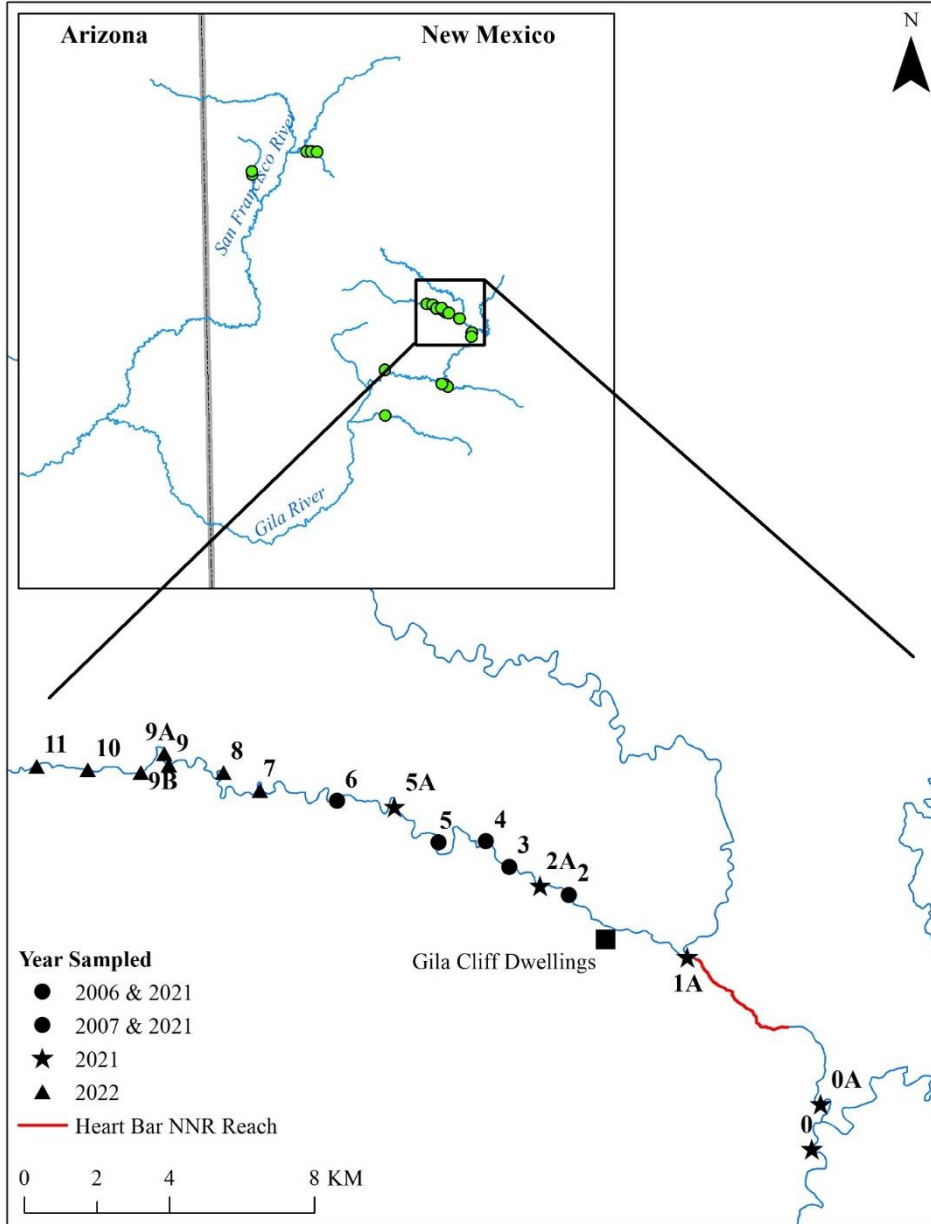


Figure 9. Location of remote inventory sites in the West Fork Gila River sampled in 2006, 2007, and 2021. Upper sites are expected to be sampled in 2022.

Table 9. Total number of fishes captured, percent composition, and Mean Density (fish/100 m<sup>2</sup>) in West Fork Gila River at remote sites Site 0, Site 0A, Site 1A, Site 2, Site 2A, Site 3, Site 4, Site 5, Site 5A, and Site 6 in 2021.

| Species             | Site 0 |                     |   | Site 0A |                     |   |
|---------------------|--------|---------------------|---|---------|---------------------|---|
|                     | N      | Percent composition | Mean Density (fish/100 m <sup>2</sup> ) | N       | Percent composition | Mean Density (fish/100 m <sup>2</sup> ) |
| Native              |        |                     |   |         |                     |   |
| Desert Sucker       | 1      | 3.3                 | 0.3                                     | 2       | 3.0                 | 1.1                                     |
| Loach Minnow        | 3      | 10.0                | 0.5                                     | 15      | 22.7                | 8.1                                     |
| Longfin Dace        | 0      | 0                   | 0                                       | 0       | 0                   | 0                                       |
| Roundtail Chub      | 0      | 0                   | 0                                       | 0       | 0                   | 0                                       |
| Sonora Sucker       | 24     | 80.0                | 6.4                                     | 36      | 54.6                | 4.7                                     |
| Speckled Dace       | 0      | 0                   | 0                                       | 0       | 0                   | 0                                       |
| Spikedace           | 0      | 0                   | 0                                       | 0       | 0                   | 0                                       |
| Nonnative           |        |                     |   |         |                     |   |
| Brown Trout         | 0      | 0                   | 0                                       | 0       | 0                   | 0                                       |
| Common Carp         | 0      | 0                   | 0                                       | 5       | 7.6                 | 0.6                                     |
| Flathead Catfish    | 0      | 0                   | 0                                       | 1       | 1.5                 | 0.1                                     |
| Oncrohynchus sp.    | 0      | 0                   | 0                                       | 0       | 0                   | 0                                       |
| Smallmouth Bass     | 1      | 3.3                 | 0.3                                     | 7       | 10.6                | 1.1                                     |
| Western Moquitofish | 0      | 0                   | 0                                       | 0       | 0                   | 0                                       |
| Yellow Bullhead     | 1      | 3.3                 | 0.2                                     | 0       | 0                   | 0                                       |

| Species             | Site 1A |                     |   | Site 2 |                     |   |
|---------------------|---------|---------------------|---|--------|---------------------|---|
|                     | N       | Percent composition | Mean Density (fish/100 m <sup>2</sup> ) | N      | Percent composition | Mean Density (fish/100 m <sup>2</sup> ) |
| Native              |         |                     |   |        |                     |   |
| Desert Sucker       | 0       | 0                   | 0                                       | 116    | 30.5                | 36.6                                    |
| Loach Minnow        | 0       | 0                   | 0                                       | 1      | 0.3                 | 0.5                                     |
| Longfin Dace        | 31      | 51.7                | 10.1                                    | 42     | 11.1                | 12.2                                    |
| Roundtail Chub      | 1       | 1.7                 | 0.2                                     | 1      | 0.3                 | 0.1                                     |
| Sonora Sucker       | 22      | 36.7                | 12.0                                    | 30     | 7.9                 | 4.8                                     |
| Speckled Dace       | 2       | 3.3                 | 1.8                                     | 148    | 39.0                | 69.4                                    |
| Spikedace           | 3       | 5.0                 | 3.6                                     | 41     | 10.8                | 16.0                                    |
| Nonnative           |         |                     |   |        |                     |   |
| Brown Trout         | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Common Carp         | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Flathead Catfish    | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Oncrohynchus sp.    | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Smallmouth Bass     | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Western Moquitofish | 1       | 1.7                 | 0.4                                     | 0      | 0                   | 0                                       |
| Yellow Bullhead     | 0       | 0                   | 0                                       | 1      | 0.3                 | 0.1                                     |

Table 9 continued.

| Species             | Site 2A |                     |   | Site 3 |                     |   |
|---------------------|---------|---------------------|---|--------|---------------------|---|
|                     | N       | Percent composition | Mean Density (fish/100 m <sup>2</sup> ) | N      | Percent composition | Mean Density (fish/100 m <sup>2</sup> ) |
| Native              |         |                     |   |        |                     |   |
| Desert Sucker       | 116     | 29.9                | 36.3                                    | 64     | 30.5                | 9.7                                     |
| Loach Minnow        | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Longfin Dace        | 13      | 3.4                 | 3.4                                     | 0      | 0                   | 0                                       |
| Roundtail Chub      | 7       | 1.8                 | 2.3                                     | 10     | 4.8                 | 2.9                                     |
| Sonora Sucker       | 68      | 17.5                | 23.0                                    | 48     | 22.9                | 13.2                                    |
| Speckled Dace       | 165     | 42.5                | 47.8                                    | 85     | 40.5                | 35.8                                    |
| Spikedace           | 19      | 4.9                 | 5.1                                     | 2      | 1.0                 | 2.2                                     |
| Nonnative           |         |                     |   |        |                     |   |
| Brown Trout         | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Common Carp         | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Flathead Catfish    | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Oncrohynchus sp.    | 0       | 0                   | 0                                       | 1      | 0.5                 | 2.2                                     |
| Smallmouth Bass     | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Western Moquitofish | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Yellow Bullhead     | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |

| Species             | Site 4 |                     |   | Site 5 |                     |   |
|---------------------|--------|---------------------|---|--------|---------------------|---|
|                     | N      | Percent composition | Mean Density (fish/100 m <sup>2</sup> ) | N      | Percent composition | Mean Density (fish/100 m <sup>2</sup> ) |
| Native              |        |                     |   |        |                     |   |
| Desert Sucker       | 66     | 28.8                | 19.8                                    | 16     | 16.2                | 4.5                                     |
| Loach Minnow        | 0      | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Longfin Dace        | 4      | 1.8                 | 0.2                                     | 7      | 7.1                 | 1.0                                     |
| Roundtail Chub      | 2      | 0.9                 | 0.9                                     | 0      | 0                   | 0                                       |
| Sonora Sucker       | 37     | 16.2                | 11.4                                    | 11     | 11.1                | 2.9                                     |
| Speckled Dace       | 113    | 49.3                | 54.3                                    | 65     | 65.7                | 24.0                                    |
| Spikedace           | 1      | 0.4                 | 0.2                                     | 0      | 0                   | 0                                       |
| Nonnative           |        |                     |   |        |                     |   |
| Brown Trout         | 3      | 1.3                 | 1.3                                     | 0      | 0                   | 0                                       |
| Common Carp         | 0      | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Flathead Catfish    | 0      | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Oncrohynchus sp.    | 3      | 1.3                 | 0.8                                     | 0      | 0                   | 0                                       |
| Smallmouth Bass     | 0      | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Western Moquitofish | 0      | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Yellow Bullhead     | 0      | 0                   | 0                                       | 0      | 0                   | 0                                       |

Table 9 continued.

| Species             | Site 5A |                     |   | Site 6 |                     |   |
|---------------------|---------|---------------------|---|--------|---------------------|---|
|                     | N       | Percent composition | Mean Density (fish/100 m <sup>2</sup> ) | N      | Percent composition | Mean Density (fish/100 m <sup>2</sup> ) |
| Native              |         |                     |   |        |                     |   |
| Desert Sucker       | 15      | 14.2                | 3.1                                     | 18     | 17.1                | 4.3                                     |
| Loach Minnow        | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Longfin Dace        | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Roundtail Chub      | 8       | 7.6                 | 0.6                                     | 18     | 17.2                | 5.0                                     |
| Sonora Sucker       | 30      | 28.3                | 3.1                                     | 36     | 34.3                | 7.5                                     |
| Speckled Dace       | 49      | 46.3                | 44.0                                    | 27     | 25.7                | 5.8                                     |
| Spikedace           | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Nonnative           |         |                     |   |        |                     |   |
| Brown Trout         | 1       | 0.9                 | 0.1                                     | 2      | 1.9                 | 0.4                                     |
| Common Carp         | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Flathead Catfish    | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Oncrohynchus sp.    | 3       | 2.8                 | 0.4                                     | 4      | 3.8                 | 0.9                                     |
| Smallmouth Bass     | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Western Moquitofish | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |
| Yellow Bullhead     | 0       | 0                   | 0                                       | 0      | 0                   | 0                                       |

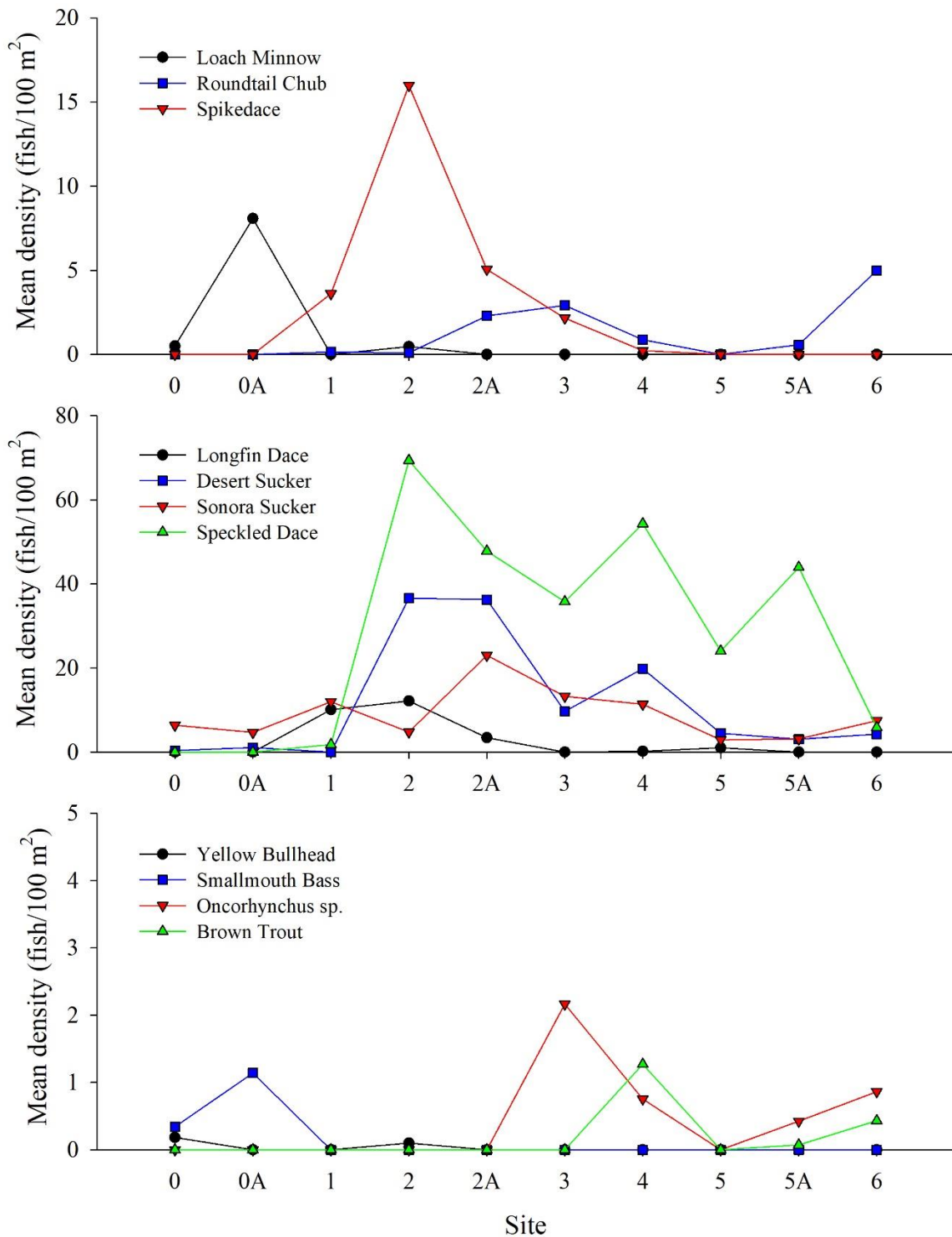


Figure 10. Densities of rare native (top), common native (middle), and nonnative species captured at each site sampled during remote site inventories of the West Fork Gila River in 2021. Note that sites go from the downstream to upstream on the x-axis.



Table 10. Occurrence of fishes at West Fork Gila River remote sites in 2006 and 2021. X indicates species presence. Grey bars indicate that sampling did not occur that year at that site.

| Species              | Site 0 |      | Site 0A |      | Site 1A |      | Site 2 |      | Site 2A |      | Site 3 |      | Site 4 |      | Site 5 |      | Site 5A |      | Site 6 |      |
|----------------------|--------|------|---------|------|---------|------|--------|------|---------|------|--------|------|--------|------|--------|------|---------|------|--------|------|
|                      | 2006   | 2021 | 2006    | 2021 | 2006    | 2021 | 2006   | 2021 | 2006    | 2021 | 2006   | 2021 | 2006   | 2021 | 2006   | 2021 | 2006    | 2021 | 2007   | 2021 |
| Native               |        |      |         |      |         |      |        |      |         |      |        |      |        |      |        |      |         |      |        |      |
| Desert Sucker        |        | X    |         | X    |         |      | X      | X    |         | X    | X      | X    | X      | X    | X      | X    |         | X    | X      | X    |
| Loach Minnow         |        | X    |         | X    |         |      |        | X    |         |      |        |      |        |      |        |      |         |      |        |      |
| Longfin Dace         |        |      |         |      |         | X    | X      |      |         | X    |        |      |        | X    |        | X    |         |      |        |      |
| Roundtail Chub       |        |      |         |      |         | X    | X      | X    |         | X    | X      | X    | X      | X    | X      |      |         | X    | X      | X    |
| Sonora Sucker        |        | X    |         | X    |         | X    | X      | X    |         | X    | X      | X    | X      | X    | X      | X    |         | X    | X      | X    |
| Speckled Dace        |        |      |         |      |         | X    | X      | X    |         | X    | X      | X    | X      | X    | X      | X    |         | X    | X      | X    |
| Spikedace            |        |      |         |      |         | X    | X      | X    |         | X    |        | X    |        | X    |        |      |         |      |        |      |
| Nonnative            |        |      |         |      |         |      |        |      |         |      |        |      |        |      |        |      |         |      |        |      |
| Brown Trout          |        |      |         |      |         |      | X      |      |         |      | X      |      | X      | X    | X      |      |         | X    | X      | X    |
| Common Carp          |        |      |         | X    |         |      |        |      |         |      |        |      |        |      |        |      |         |      |        |      |
| Fathead Minnow       |        |      |         |      |         |      |        |      |         |      |        |      | X      |      |        |      |         |      |        |      |
| Flathead Catfish     |        |      |         | X    |         |      |        |      |         |      |        |      |        |      |        |      |         |      |        |      |
| Rainbow Trout        |        |      |         |      |         |      | X      |      |         |      | X      | X    | X      | X    | X      |      |         | X    | X      | X    |
| Smallmouth Bass      |        | X    |         | X    |         |      | X      |      |         |      | X      |      | X      |      |        |      |         |      |        |      |
| Western Mosquitofish |        |      |         |      |         | X    |        |      |         |      |        |      |        |      |        |      |         |      |        |      |
| Yellow Bullhead      |        | X    |         |      |         |      |        | X    |         |      |        |      |        |      |        |      |         |      |        |      |

Table 11. Number of fish captured at West Fork Gila River remote sites in 2006 and 2021. Grey bars indicate that sampling did not occur that year at that site.

| Species              | Site 0 |      | Site 0A |      | Site 1A |      | Site 2 |      | Site 2A |      | Site 3 |      | Site 4 |      | Site 5 |      | Site 5A |      | Site 6 |      |
|----------------------|--------|------|---------|------|---------|------|--------|------|---------|------|--------|------|--------|------|--------|------|---------|------|--------|------|
|                      | 2006   | 2021 | 2006    | 2021 | 2006    | 2021 | 2006   | 2021 | 2006    | 2021 | 2006   | 2021 | 2006   | 2021 | 2006   | 2021 | 2006    | 2021 | 2007   | 2021 |
| Native               |        |      |         |      |         |      |        |      |         |      |        |      |        |      |        |      |         |      |        |      |
| Desert Sucker        |        | 1    |         | 2    |         | 0    | 39     | 116  |         | 112  | 31     | 64   | 17     | 66   | 31     | 16   |         | 15   | 32     | 18   |
| Loach Minnow         |        | 3    |         | 15   |         | 0    | 0      | 1    |         | 0    | 0      | 0    | 0      | 0    | 0      | 0    |         | 0    | 0      | 0    |
| Longfin Dace         |        | 0    |         | 0    |         | 31   | 0      | 42   |         | 13   | 0      | 0    | 0      | 4    | 0      | 7    |         | 0    | 0      | 0    |
| Roundtail Chub       |        | 0    |         | 0    |         | 1    | 88     | 1    |         | 7    | 23     | 10   | 25     | 2    | 10     | 0    |         | 8    | 3      | 18   |
| Sonora Sucker        |        | 24   |         | 36   |         | 22   | 188    | 30   |         | 68   | 45     | 48   | 63     | 37   | 49     | 11   |         | 30   | 22     | 36   |
| Speckled Dace        |        | 0    |         | 0    |         | 2    | 36     | 148  |         | 165  | 53     | 85   | 35     | 113  | 126    | 65   |         | 49   | 45     | 27   |
| Spikedace            |        | 0    |         | 0    |         | 3    | 119    | 41   |         | 19   | 0      | 2    | 0      | 1    | 0      | 0    |         | 0    | 0      | 0    |
| Nonnative            |        |      |         |      |         |      |        |      |         |      |        |      |        |      |        |      |         |      |        |      |
| Brown Trout          |        | 0    |         | 0    |         | 0    | 7      | 0    |         | 0    | 54     | 0    | 1      | 3    | 12     | 0    |         | 1    | 205    | 2    |
| Common Carp          |        | 0    |         | 5    |         | 0    | 0      | 0    |         | 0    | 0      | 0    | 0      | 0    | 0      | 0    |         | 0    | 0      | 0    |
| Fathead Minnow       |        | 0    |         | 0    |         | 0    | 0      | 0    |         | 0    | 0      | 0    | 1      | 0    | 0      | 0    |         | 0    | 0      | 0    |
| Flathead Catfish     |        | 0    |         | 1    |         | 0    | 0      | 0    |         | 0    | 0      | 0    | 0      | 0    | 0      | 0    |         | 0    | 0      | 0    |
| Rainbow Trout        |        | 0    |         | 0    |         | 0    | 1      | 0    |         | 0    | 18     | 1    | 10     | 3    | 21     | 0    |         | 3    | 5      | 4    |
| Smallmouth Bass      |        | 1    |         | 7    |         | 0    | 2      | 0    |         | 0    | 8      | 0    | 1      | 0    | 0      | 0    |         | 0    | 0      | 0    |
| Western Mosquitofish |        | 0    |         | 0    |         | 1    | 0      | 0    |         | 0    | 0      | 0    | 0      | 0    | 0      | 0    |         | 0    | 0      | 0    |
| Yellow Bullhead      |        | 1    |         | 0    |         | 0    | 0      | 1    |         | 0    | 0      | 0    | 0      | 0    | 0      | 0    |         | 0    | 0      | 0    |

## **Recommendations**

- The West Fork Gila drainage still retains the complete assemblage of native fish species including Loach Minnow and Spikedace. The remaining sites in the upper portion of the West Fork Gila River should be surveyed in 2022 to assess the distribution of native priority species.

## **Work Planned for 2022**

- Survey the 7 remaining sites in the upper West Fork Gila River.

## GILA RIVER BASIN PERMANENT SITE MONITORING (TASK NM-2020-1)

### Strategic Plan Goals:

- Prevent extinction and manage toward recovery
  - Goal 1. Identify critical streams and populations in need of protection and potential replication.
  - Goal 9. Monitor to quantitatively measure and evaluate project success in improving the status of target species and their habitats.
  - Goal 10. Maintain accurate Program tracking records.

### Recovery Objectives

- Loach Minnow Recovery Plan (1991)
  - Task 1.1 (priority 1): Identify all populations and determine level of protection
  - Task 2.5 (priority 1): Monitor community composition including range of natural variation
  - Task 3.1-2 (priority 2): Identify nature and significance of interaction with nonnative fishes
  - Task 6.2 (priority 3): Identify and prepare sites for reintroduction
- Spikedace Recovery Plan (1991)
  - Task 1.1 (priority 1): Identify all populations and determine level of protection
  - Task 2.5 (priority 1): Monitor community composition including range of natural variation
  - Task 3.1-2 (priority 2): Identify nature and significance of interaction with nonnative fishes
  - Task 6.2 (priority 3): Identify and prepare sites for reintroduction

### Background

Annual monitoring of five sites in the Gila River Basin has been completed since 1988. An additional four sites have been added since 1989 (Table 12). This annual sampling is conducted to track changes in presence and density of native and nonnative fishes throughout the Gila River Basin. Data from this effort informs recovery actions for priority species throughout the basin. There are nine permanent sites monitored annually in the Gila River Basin (Figure 11).

Sampling normally occurs each year in October or early November. At each site, sampling for fish in each individual habitat occurs in rough proportion to its availability within a site. The particular method used to obtain specimens depends upon the habitat type being sampled. Pools and runs are electrofished with two shockers simultaneously, riffles are electrofished and kicknetted into a seine, and sandy shoals are seine (normally 3.0 x 1.2 m, 3.2 mm mesh seine). All fish collected from each habitat are identified, enumerated, measured (nearest 1 mm total length (TL)), and weighed (nearest 1 g) if greater than 99 mm TL. All native fish are released back into the habitat they were captured from and all nonnatives are removed from the system.

Following fish collection, a single measurement of length (nearest 0.1 m), and width (nearest 0.01 m), depth (nearest 0.01 m), and water velocity (nearest 0.01 m/s) are measured at several locations within the sampled area of each sampled habitat. For analysis, these measurements are averaged for each mesohabitat. Substrate composition was characterized visually at several locations within sampled portion of each mesohabitat. Other habitat features, such as overhead cover, debris, and vegetation, are also noted.

Table 12. Gila River Basin permanent site sampling history by waterbody and site.

| Waterbody              | Site Name                          | Years Sampled | Previous Sites             |
|------------------------|------------------------------------|---------------|----------------------------|
| East Fork Gila River   | Fall Springs                       | 1996-present  | 1988-1995, 4 km upstream   |
| Gila River             | Ash Canyon (previously Middle Box) | 2012-present  | 1997-2011, 5 km upstream   |
| Gila River             | Cherokee Canyon                    | 2009-present  | 2009-2019                  |
| Gila River             | Fisherman's Overlook               | 1997-2008     |                            |
| Gila River             | Iron Bridge                        | 1988-present  |                            |
| Gila River             | Sunset Diversion                   | 2014-present  | 2010-2013, above diversion |
| Middle Fork Gila River | Trailhead                          | 1988-present  |                            |
| San Francisco River    | Glenwood Ranger Station            | 1997-present  | 1988-1997, 1 km upstream   |
| Tularosa River         | Eagle Peak Road                    | 1988-present  |                            |
| West Fork Gila River   | Gila Cliff Dwellings               | 1989-present  |                            |

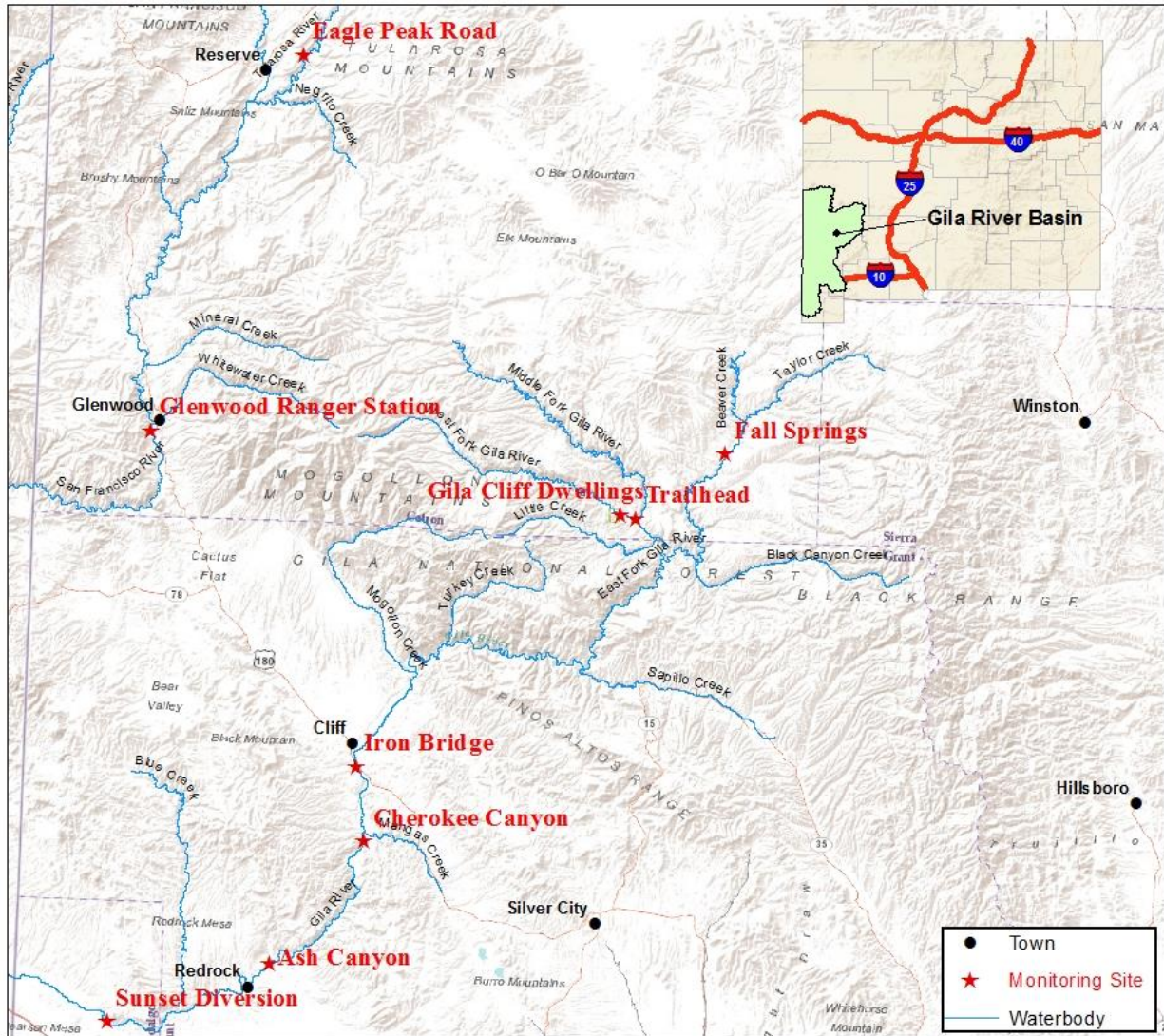


Figure 11. Location of nine annual monitoring sites throughout the Gila River Basin.

## Results

Department, USFWS, and USFS personnel surveyed the permanent sites October 25 – 29, 2021. Results from permanent site monitoring in 2021 are listed below by site, in order from most upstream site to most downstream site.

### *Tularosa River—Eagle Peak Road*

The Eagle Peak Road site on the Tularosa River has been sampled since 1988. In that time, 10 fish species have been collected (Table 13 and A1). All expected native species except Loach Minnow were found and one nonnative species (Fathead Minnow *Pimephales promelas*, n = 1) was captured in 2021. The most abundant species was Longfin Dace (Table 14). The only nonnative species collected in the past five years was a single Fathead Minnow that was captured in 2021. Most native species have shown an overall increase in density over the past 4 years (Figure 12). Habitat sampled in 2021 consisted of mostly runs (Table 15).

Table 13. Occurrence of fishes at Tularosa River Eagle Peak Road site, Catron County, New Mexico, 1988–2021. X indicates species presence.

| Species              | Year |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
|----------------------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|--|
|                      | 88   | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |   |   |   |  |
| <b>Native</b>        |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Desert Sucker        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X |  |
| Loach Minnow         | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    | X  | X  |    |    |    |    |    |    | X  | X  | X  |    |    |    | X |   |   |  |
| Longfin Dace         | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X |  |
| Sonora Sucker        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X |  |
| Speckled Dace        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X |  |
| <b>Nonnative</b>     |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Brook Stickleback    |      |    |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Fathead Minnow       |      |    |    | X  |    |    |    | X  | X  |    |    |    | X  |    |    |    |    | X  |    |    | X  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |   |   | X |  |
| Green Sunfish        |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |   | X |   |  |
| Rainbow Trout        |      |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |  |
| Western Mosquitofish |      | X  |    | X  | X  |    | X  |    | X  |    |    |    | X  | X  | X  | X  | X  |    |    | X  |    |    | X  | X  | X  | X  |    |    |    |    |    |    |    |    |   | X |   |  |

Table 14. Number, percent composition, and density of fish captured in the Tularosa River at Eagle Peak Road site in 2021.

| Species          | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|------------------|---------------|---------------------|------------------------------------|
| <b>Native</b>    |               |                     |                                    |
| Desert Sucker    | 82            | 24.62               | 35.06                              |
| Longfin Dace     | 143           | 42.94               | 61.14                              |
| Sonora Sucker    | 95            | 28.53               | 40.62                              |
| Speckled Dace    | 12            | 3.60                | 5.13                               |
| <b>Nonnative</b> |               |                     |                                    |
| Fathead Minnow   | 1             | 0.30                | 0.43                               |

Table 15. Area sampled, habitat composition, depth (mean ± standard error (SE), if n > 1), and mean velocity (mean ± SE, if n > 1) of all habitat types sampled within the Tularosa River at Eagle Peak Road in 2021.

| Habitat Type | Area Sampled (m <sup>2</sup> ) | Composition (%) | Depth (m)   | Velocity (m/s) |
|--------------|--------------------------------|-----------------|-------------|----------------|
| Pool         | 75                             | 31.94           | 0.29 ± 0.00 | 0.18 ± 0.00    |
| Riffle       | 48                             | 20.59           | 0.15 ± 0.00 | 0.40 ± 0.00    |
| Run          | 111                            | 47.48           | 0.18 ± 0.01 | 0.29 ± 0.01    |

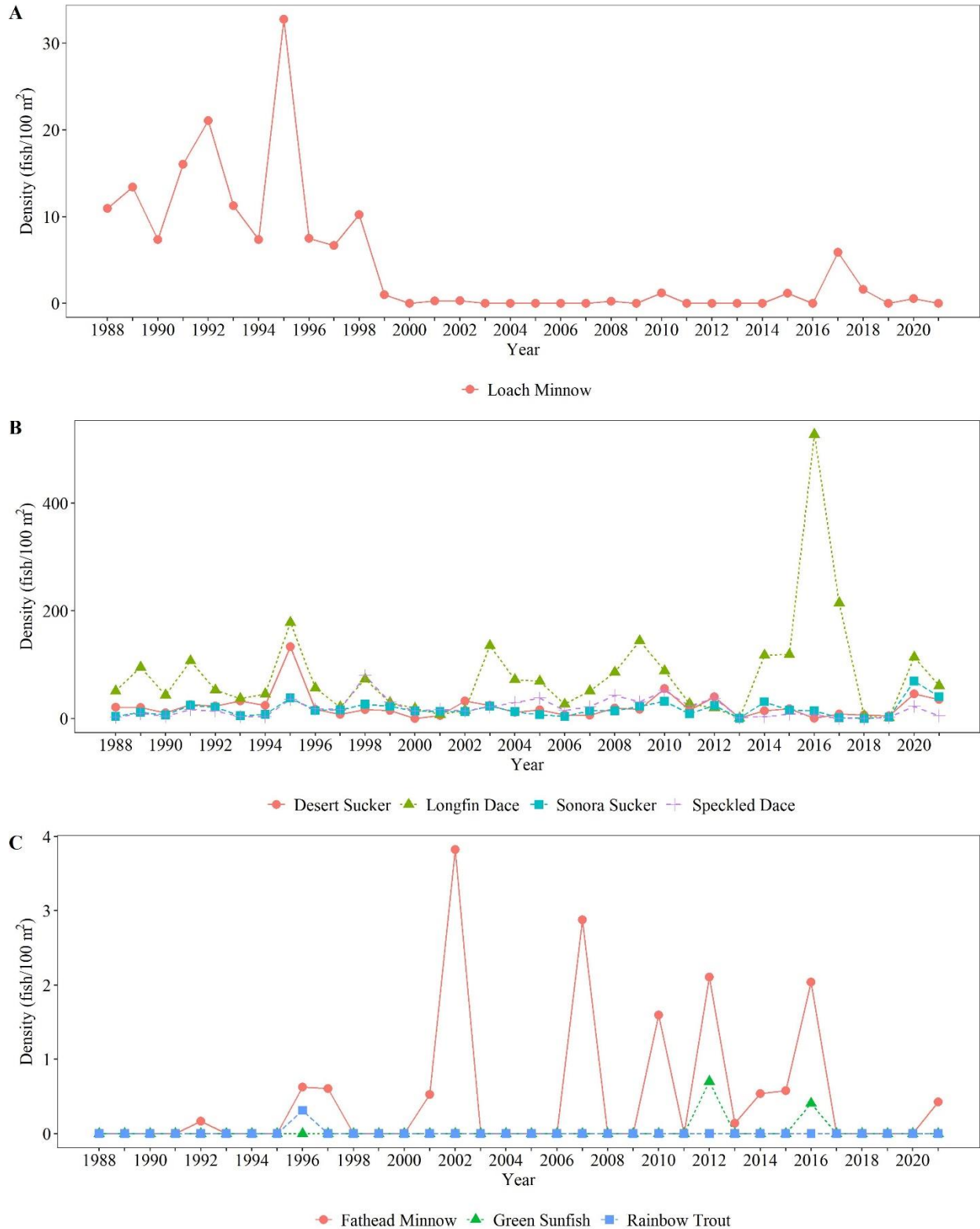


Figure 12. Density (fish/100 m<sup>2</sup>) of fish captured at Tularosa River Eagle Peak Road site from 1988 to 2021. For clarity, charts are split into priority species (A), all other native species (B), and prominent concerning nonnative species (C).



*San Francisco River—Glenwood Ranger Station*

The Glenwood Ranger Station site on the San Francisco River has been a permanent site since 1988. The site was impacted by ash flows as a result of the Whitewater-Baldy Fire in the spring of 2012 and no fish were collected in 2012 (Table A2). One Fathead Minnow was collected in 2013. Desert Sucker, Longfin Dace, and Sonora Sucker had recolonized the site by 2014, and in 2015 all native fish species that were present before the fire were collected. In 2017, Spikedace were recorded in the San Francisco River for the first time since 1950. Spikedace were stocked approximately 15 miles upstream of the permanent site location in the San Francisco River four times between 2008 and 2014. Spikedace were captured again at the site in 2019, 2020 and 2021. In 2020, Smallmouth Bass were captured at the site for the first time (Table 16). Captured Smallmouth Bass were young-of-year fish, each under 80 mm total length. There are no other records of Smallmouth Bass in the San Francisco River upstream of Pleasanton, NM. No Smallmouth Bass were captured in 2021. Native Catostomids were the most abundant species in 2021 (Table 17). No Loach Minnow were captured at the site for the first time since 2014. Most species showed a decrease in abundance as compared to 2020 (Figure 13). Run habitat made up 53.1% of the habitat sampled within the site (Table 18).

Table 16. Occurrence of fishes at San Francisco River Glenwood Ranger Station site, Catron County, New Mexico, 1988–2020. X indicates species presence.

| Species              | Year |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
|----------------------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|
|                      | 88   | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |   |   |   |   |   |
| NO MONITORING        |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| <b>Native</b>        |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Desert Sucker        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X |   |   |
| Loach Minnow         | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X |   |   |
| Longfin Dace         | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X |   |   |
| Sonora Sucker        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X |   |
| Speckled Dace        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X |   |
| Spikedace            |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   | X | X | X |
| <b>Nonnative</b>     |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Fathead Minnow       | X    | X  |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  |    |    |    | X  | X  | X  | X  |    |    |    |    |    |   |   |   |   |   |
| Largemouth Bass      |      |    |    | X  |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Rainbow Trout        |      |    | X  | X  | X  |    | X  |    |    |    | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Smallmouth Bass      |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   | X |
| Western Mosquitofish | X    |    | X  |    |    |    | X  |    |    |    |    | X  |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   | X |

Table 17. Number, percent composition, and density of fish captured in the San Francisco River at Glenwood Ranger Station in 2021.

| Species       | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|---------------|---------------|---------------------|------------------------------------|
| <b>Native</b> |               |                     |                                    |
| Desert Sucker | 28            | 66.67               | 9.67                               |
| Longfin Dace  | 1             | 2.38                | 0.35                               |
| Sonora Sucker | 9             | 21.43               | 3.11                               |
| Speckled Dace | 3             | 7.14                | 1.04                               |
| Spikedace     | 1             | 2.38                | 0.35                               |

Table 18. Area sampled, habitat composition, depth (mean  $\pm$  standard error (SE), if  $n > 1$ ), and mean velocity (mean  $\pm$  SE, if  $n > 1$ ) of all habitat types sampled within the San Francisco River at Glenwood Ranger Station in 2021.

| Habitat Type | Area Sampled (m <sup>2</sup> ) | Composition (%) | Depth (m)       | Velocity (m/s)  |
|--------------|--------------------------------|-----------------|-----------------|-----------------|
| Pool         | 28                             | 9.52            | 1.00 $\pm$ 0.00 | 0.31 $\pm$ 0.00 |
| Riffle       | 108                            | 37.37           | 0.22 $\pm$ 0.01 | 0.79 $\pm$ 0.03 |
| Run          | 154                            | 53.11           | 0.43 $\pm$ 0.00 | 0.37 $\pm$ 0.00 |

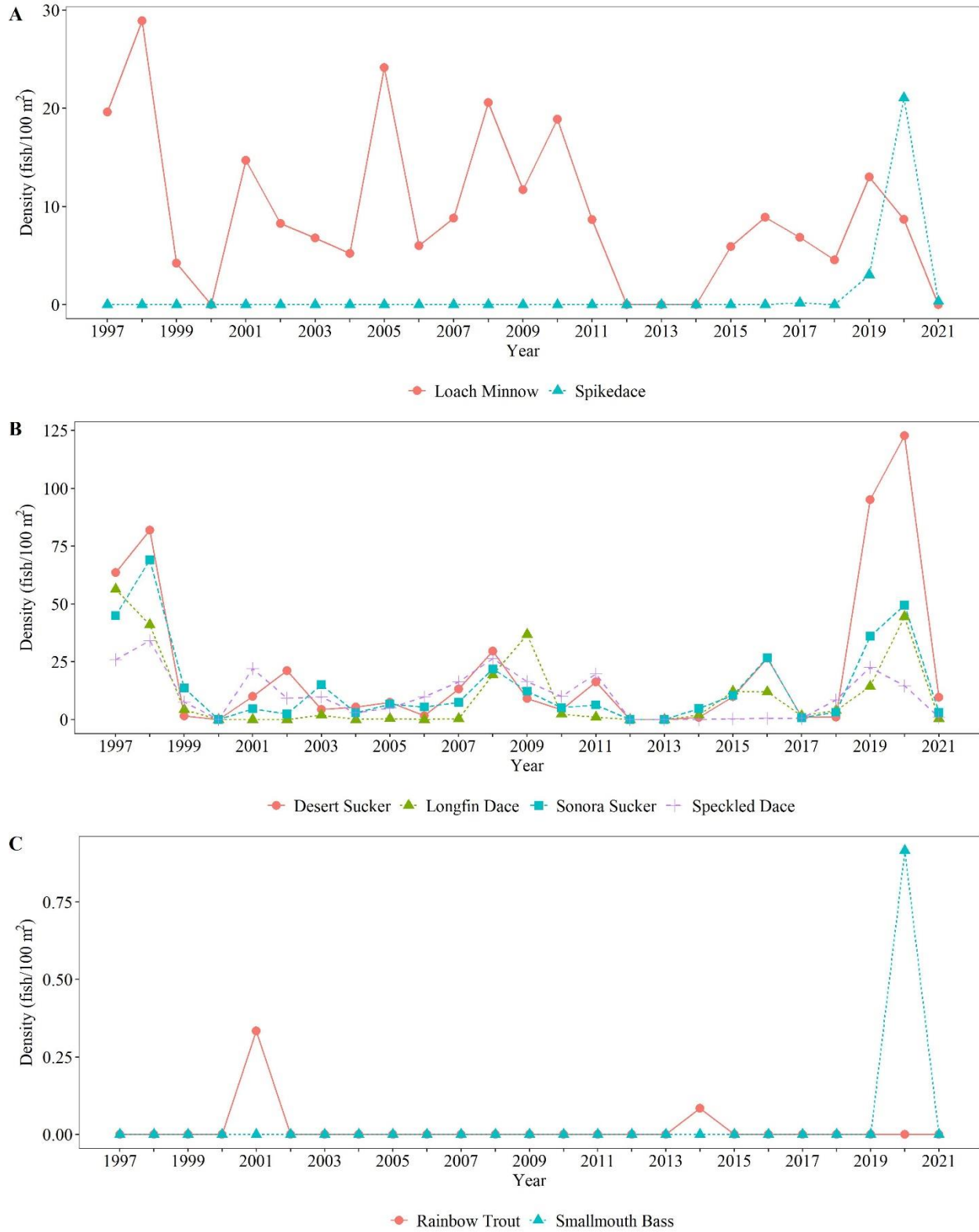


Figure 13. Density of fish species captured at San Francisco River at Glenwood Ranger Station site from 1997 to 2021. For clarity, charts are split into priority species (A), all other native species (B), and prominent concerning nonnative species (C).

*East Fork Gila River—Fall Springs*

Sampling began at the East Fork Gila River Fall Springs site in 1988. The site was shifted downstream from its original location on private property to the Gila National Forest in 1996. The new site has similar characteristics to the original site and data from the two sites have been combined for long term reporting. Loach Minnow have not been captured at the site since 1999 and Spikedace have not been captured since 2000 (Table 19 and A3). Yellow Bullhead was the most abundant species captured in 2021, while Sonora Sucker was the most abundant native species captured (Table 20). However, Desert Sucker and Sonora Sucker density decreased from 2020 to 2021 (Figure 14). The majority of the habitat sampled in 2021 consisted of runs (Table 21).

Table 19. Occurrence of fishes at East Fork Gila River Fall Springs site, Catron County, New Mexico, 1988–2021. X indicates species presence.

| Species              | Year |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |   |
|----------------------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|
|                      | 88   | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |   |   |   |   |   |   |
| <b>Native</b>        |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |   |
| Desert Sucker        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X |   |   |   |
| Loach Minnow         | X    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |   |
| Longfin Dace         | X    | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |   |
| Roundtail Chub       | X    | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X |   |   |
| Sonora Sucker        | X    | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X |   |   |
| Speckled Dace        | X    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |   |
| Spikedace            | X    | X  | X  |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |   |
| <b>Nonnative</b>     |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |   |
| Channel Catfish      | X    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |   |
| Catfish spp.         |      |    | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    | X  | X  |    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X |   |   |
| Fathead Minnow       | X    | X  |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |   |
| Green Sunfish        |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  |    | X  | X  | X  |    |    | X  |    |    |    |    |    |    |    |    |   |   |   |   |   |   |
| Largemouth Bass      |      |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |   |
| Smallmouth Bass      |      |    |    | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X | X | X |
| Western Mosquitofish | X    | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X | X | X |
| Yellow Bullhead      |      |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    | X  | X  |    | X  | X  | X  |    |    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X | X | X |

Table 20. Number, percent composition, and density of fish captured in the East Fork Gila River at Fall Springs in 2021.

| Species               | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|-----------------------|---------------|---------------------|------------------------------------|
| <b>Native</b>         |               |                     |                                    |
| Desert Sucker         | 3             | 6.82                | 0.63                               |
| Sonora Sucker         | 9             | 20.45               | 1.89                               |
| <b>Nonnative</b>      |               |                     |                                    |
| <i>Ictalurus</i> spp. | 12            | 27.27               | 2.53                               |
| Smallmouth Bass       | 1             | 2.27                | 0.21                               |
| Yellow Bullhead       | 19            | 43.18               | 4.00                               |

Table 21. Area sampled, habitat composition, depth (mean  $\pm$  standard error (SE), if  $n > 1$ ), and mean velocity (mean  $\pm$  SE, if  $n > 1$ ) of all habitat types sampled within the East Fork Gila River at Fall Springs in 2021.

| Habitat Type | Area Sampled (m <sup>2</sup> ) | Composition (%) | Depth (m)       | Velocity (m/s)  |
|--------------|--------------------------------|-----------------|-----------------|-----------------|
| Pool         | 55                             | 11.59           | 0.56 $\pm$ 0.00 | 0.31 $\pm$ 0.01 |
| Riffle       | 78                             | 16.48           | 0.34 $\pm$ 0.00 | 0.72 $\pm$ 0.00 |
| Run          | 342                            | 71.93           | 0.41 $\pm$ 0.01 | 0.73 $\pm$ 0.00 |

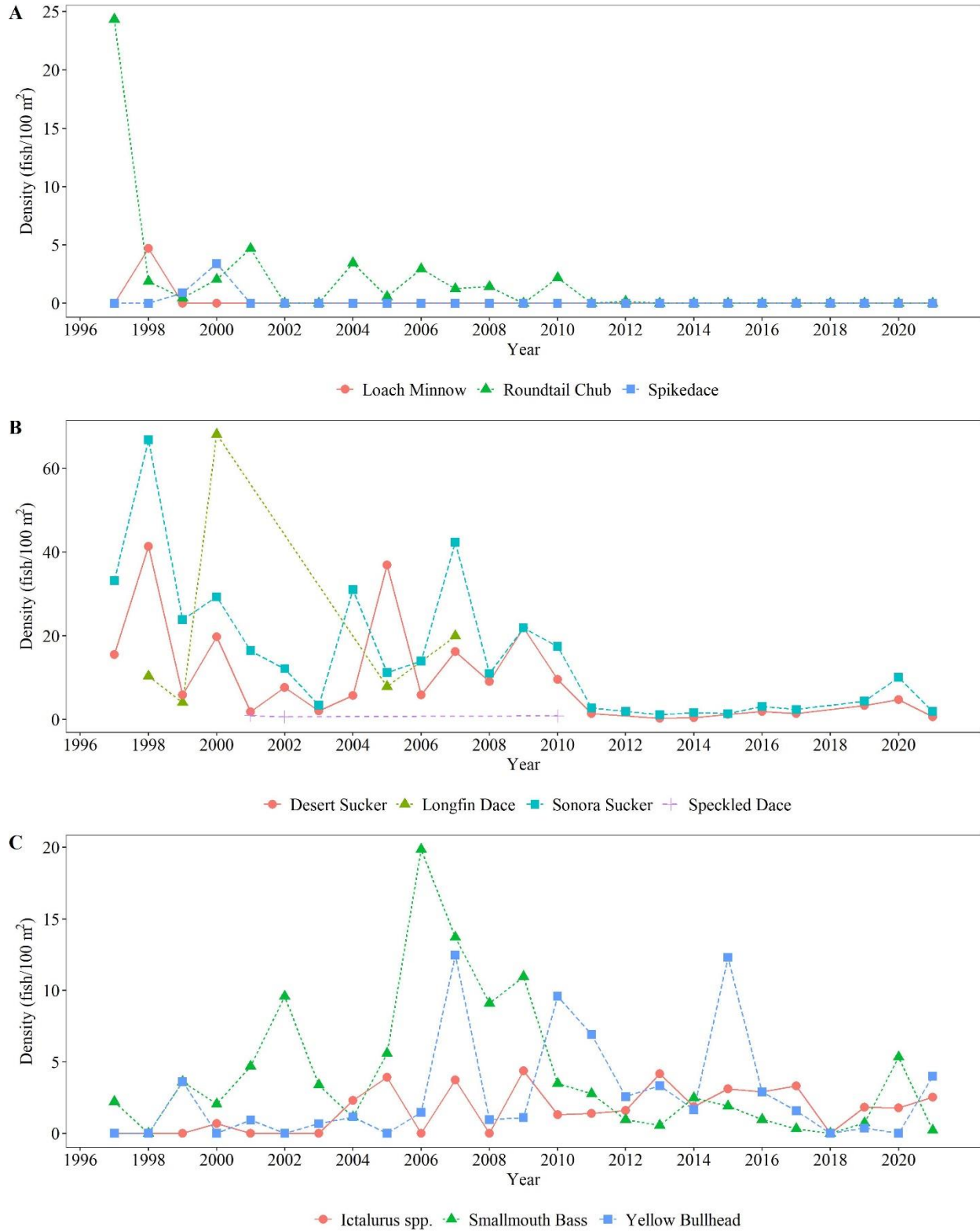


Figure 14. Density of fish species captured at East Fork Gila River at Fall Springs site from 1996 to 2021. For clarity, charts are split into priority species (A), all other native species (B), and prominent concerning nonnative species (C).

*West Fork Gila River—Gila Cliff Dwellings*

The Gila Cliff Dwellings site on the West Fork Gila River was added as a permanent site in 1989. From 2001 through 2003, and during 2011 and 2012, wildfires (i.e., Cub, Dry Lakes, Miller, and Whitewater-Baldy) burned portions of the West Fork Gila River Drainage. Ash flows, caused by intense summer storms and spring snowmelt, negatively affected on fishes in the West Fork Gila River. In 2014, Loach Minnow were collected for the first time since 2001 and had been collected annually until 2021 (Table 22 and A4). Speckled Dace was the most abundant species captured in 2021. No nonnative fishes were present in 2021 (Table 23). Spikedace decreased slightly in density from 2020 to 2021 (Figure 15). Runs were the most abundant habitat sampled, making up 65.8% of the habitat sampled within the site (Table 24).

Table 22. Occurrence of fishes at West Fork Gila River Cliff Dwellings site, Catron County, New Mexico, 1989–2020. X indicates species presence.

| Species              | Year |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----------------------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                      | 89   | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| <b>Native</b>        |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Desert Sucker        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Gila Trout           |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  |
| Loach Minnow         | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X  |    |
| Longfin Dace         | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Roundtail Chub       |      |    | X  | X  |    |    |    |    |    | X  | X  | X  | X  | X  | X  | X  | X  |    |    | X  | X  |    |    |    |    |    |    |    |    | X  |    |    |
| Sonora Sucker        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Speckled Dace        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Spikedace            | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| <b>Nonnative</b>     |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Brown Trout          |      |    |    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Rainbow Trout        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Smallmouth Bass      | X    | X  | X  | X  |    |    |    |    | X  |    |    |    |    |    | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  |    |
| Western Mosquitofish |      |    | X  | X  |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Yellow Bullhead      | X    |    |    |    |    |    | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |

Table 23. Number, percent composition, and density of fish captured in the West Fork Gila River at Gila Cliff Dwellings in 2021.

| Species       | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|---------------|---------------|---------------------|------------------------------------|
| <b>Native</b> |               |                     |                                    |
| Desert Sucker | 7             | 9.86                | 2.43                               |
| Longfin Dace  | 1             | 1.41                | 0.35                               |
| Sonora Sucker | 27            | 38.03               | 9.37                               |
| Speckled Dace | 32            | 45.07               | 11.11                              |
| Spikedace     | 4             | 5.63                | 1.39                               |

Table 24. Area sampled, habitat composition, depth (mean  $\pm$  standard error (SE), if  $n > 1$ ), and mean velocity (mean  $\pm$  SE, if  $n > 1$ ) of all habitat types sampled within the West Fork Gila River at Gila Cliff Dwellings in 2021.

| Habitat Type | Area Sampled (m <sup>2</sup> ) | Composition (%) | Depth (m)       | Velocity (m/s)  |
|--------------|--------------------------------|-----------------|-----------------|-----------------|
| Riffle       | 98                             | 34.16           | 0.20 $\pm$ 0.01 | 0.66 $\pm$ 0.01 |
| Run          | 190                            | 65.84           | 0.51 $\pm$ 0.01 | 0.12 $\pm$ 0.01 |



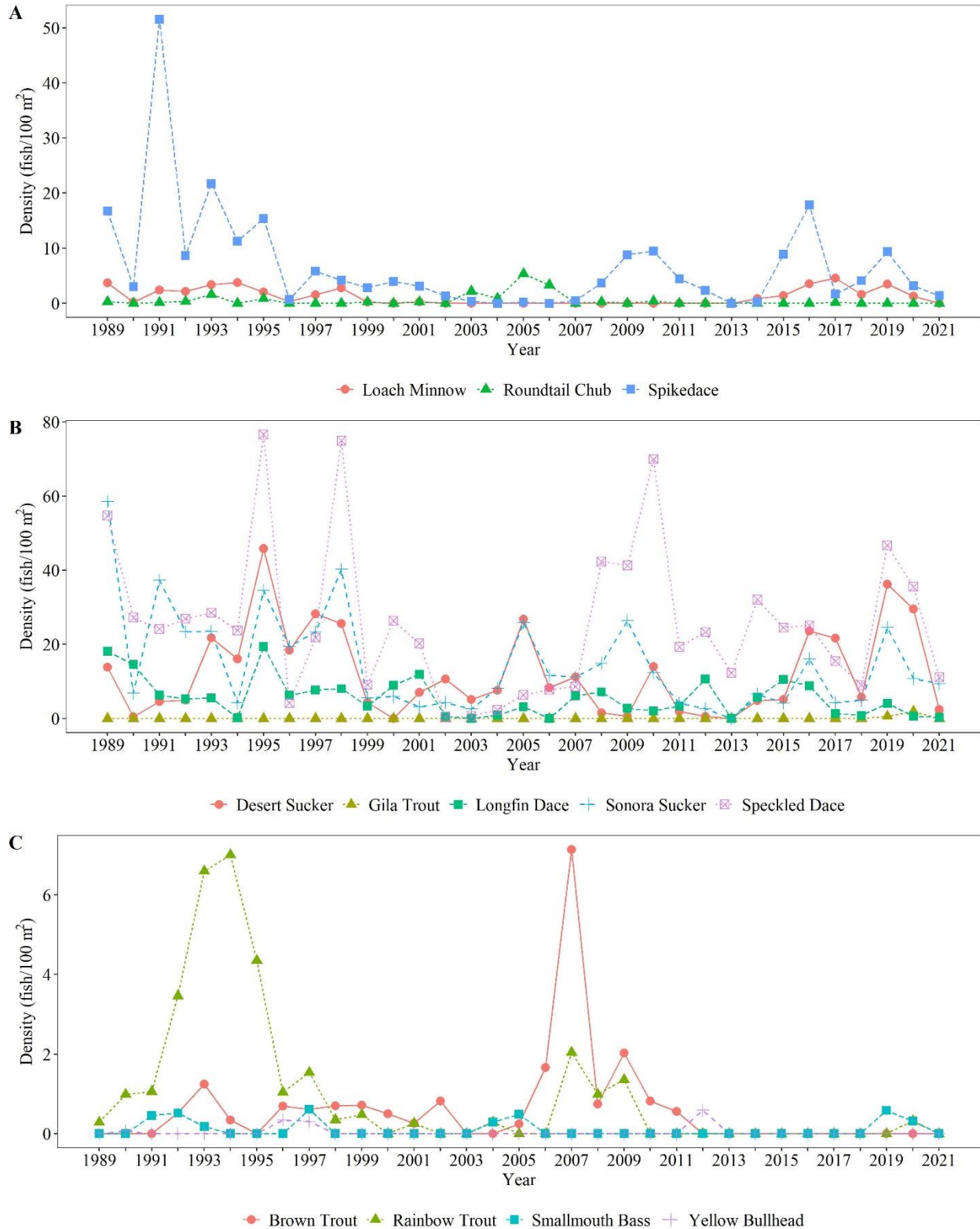


Figure 15. Density of fish species captured at West Fork Gila River at Gila Cliff Dwellings site from 1989 to 2021. For clarity, charts are split into priority species (A), all other native species (B), and prominent concerning nonnative species (C).

*Middle Fork Gila River—Trailhead*

The Trailhead site on the Middle Fork Gila River is an original permanent site where sampling began in 1988. High densities of nonnatives were common at this site until 2012 when the Whitewater Baldy Fire burned large areas of the watershed. Ash flows, silt and debris affected the site during the monsoon seasons of 2012 and 2013. The 2012 sampling had the fewest fish collected since sampling began, followed by a small recovery of native species in 2013. In 2014 and 2015, the diversity of native fish species remained high, but Yellow Bullhead was the second most common species (Table A5). In 2017, all native fish species were documented in the same year for the first time since 1995. Spikedace have not been captured since 2017 and Loach Minnow were not captured for the third consecutive year in 2021 (Table 25). Yellow Bullhead was the most abundant species in 2021 (Table 26), though the overall number of fishes captured was low (n = 17). Smallmouth Bass decreased sharply in density from the previous year (Figure 16). Pool habitat was the most common habitat sampled within the site (Table 27).

Table 25. Occurrence of fishes at Middle Fork Gila River Trailhead site, Catron County, New Mexico, 1988–2021. X indicates species presence.

| Species              | Year |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
|----------------------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|
|                      | 88   | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |   |   |   |   |   |
| Native               |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Desert Sucker        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X |   |   |   |
| Loach Minnow         | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X |   |   |   |
| Longfin Dace         | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X |   |   |   |
| Roundtail Chub       | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X |   |   |   |
| Sonora Sucker        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X |   |   |
| Speckled Dace        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X |   |   |
| Spikedace            | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X |   |   |
| Nonnative            |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Black Bullhead       | X    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Bluegill             |      |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Brown Trout          | X    | X  | X  |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Common Carp          |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  |    |    | X  | X  |    |    | X  | X  |    |    | X | X |   |   |   |
| Fathead Minnow       | X    |    |    | X  |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  | X  |    |    | X  |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Flathead Catfish     |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |   |   |   | X |   |
| Green Sunfish        |      |    |    |    | X  |    |    |    |    | X  |    |    |    |    |    | X  |    |    | X  |    |    | X  | X  |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Rainbow Trout        |      | X  |    |    |    | X  |    |    |    |    | X  | X  | X  |    |    |    |    |    |    |    |    | X  | X  |    |    |    |    | X  |    |    |    |    |    |    |   | X |   | X |   |
| Red Shiner           |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Smallmouth Bass      | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X | X |
| Western Mosquitofish | X    |    |    | X  |    | X  |    |    | X  |    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X |   |
| Yellow Bullhead      | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X | X |

Table 26. Total number of fishes captured, percent composition, and density in the Middle Fork Gila River at Trailhead in 2021.

| Species              | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|----------------------|---------------|---------------------|------------------------------------|
| Native               |               |                     |                                    |
| Sonora Sucker        | 1             | 5.88                | 0.45                               |
| Nonnative            |               |                     |                                    |
| Common Carp          | 2             | 11.76               | 0.90                               |
| Flathead Catfish     | 1             | 5.88                | 0.45                               |
| Smallmouth Bass      | 1             | 5.88                | 0.45                               |
| Western Mosquitofish | 4             | 23.53               | 1.80                               |
| Yellow Bullhead      | 8             | 47.06               | 3.60                               |

Table 27. Area sampled, habitat composition, depth (mean  $\pm$  standard error (SE), if  $n > 1$ ), and mean velocity (mean  $\pm$  SE, if  $n > 1$ ) of all habitat types sampled within the Middle Fork Gila River at Trailhead in 2021.

| Habitat Type | Area Sampled (m <sup>2</sup> ) | Composition (%) | Depth (m)       | Velocity (m/s) |
|--------------|--------------------------------|-----------------|-----------------|----------------|
| Pool         | 157                            | 70.73           | 0.66 $\pm$ 0.01 | NA             |
| Run          | 65                             | 29.27           | 0.73 $\pm$ 0.04 | NA             |

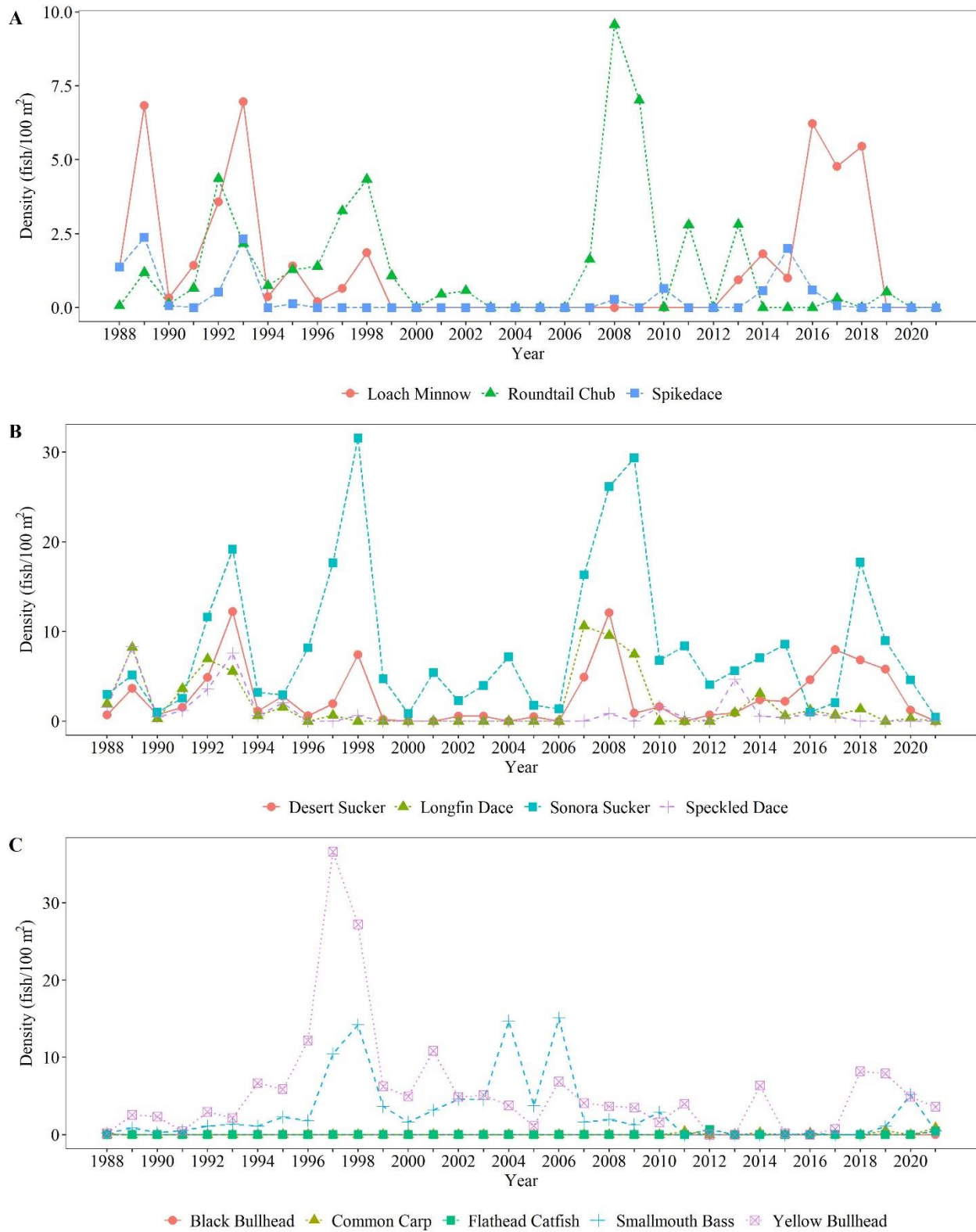


Figure 16. Density of fish species captured at Middle Fork Gila River at Trailhead site from 1988 to 2021. For clarity, charts are split into priority species (A), all other native species (B), and prominent concerning nonnative species (C).

*Gila River—Iron Bridge*

The Iron Bridge site on the Gila River is one of the original permanent monitoring sites where sampling began in 1988. All native fish species, with the exception of Roundtail Chub were consistently captured at the site until 2021 (Table 28 and A6). Desert Sucker, Roundtail Chub, Sonora Sucker, and Spikedace were absent during sampling in 2021. Loach Minnow was the most abundant species collected (Table 29). Riffles made up most of the habitat sampled (Table 30). Density of most native fishes decreased from that measured in 2020 (Figure 17).

Table 28. Occurrence of fishes at the Gila River Iron Bridge site, Grant County, New Mexico, 1988–2021. X indicates species presence.

| Species              | Year |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
|----------------------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|
|                      | 88   | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |   |   |   |   |   |
| <b>Native</b>        |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Desert Sucker        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X |   |   |
| Loach Minnow         | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X |   |
| Longfin Dace         | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X |   |
| Roundtail Chub       |      |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Sonora Sucker        | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X |   |
| Spikedace            | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X |   |
| <b>Nonnative</b>     |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Black Bullhead       |      |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Channel Catfish      | X    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   | X |
| Common Carp          |      |    |    | X  |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |   |   |   |   |   |
| Fathead Minnow       |      |    |    |    |    |    |    |    |    |    | X  | X  |    |    |    |    | X  |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |   |   |   |   | X |
| Flathead Catfish     | X    |    | X  |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X |   |   |   |   |
| Green Sunfish        |      | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    | X  |    |    |    |    |    |   |   |   |   |   |
| Largemouth Bass      |      |    | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Red Shiner           |      |    | X  |    | X  |    | X  | X  |    | X  | X  |    |    |    | X  | X  |    |    |    | X  | X  |    |    |    |    | X  |    |    |    |    |    |    |    |    |   |   |   | X |   |
| Smallmouth Bass      |      | X  | X  | X  |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    | X  |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |
| Western Mosquitofish | X    | X  | X  | X  | X  | X  | X  |    |    |    | X  | X  |    |    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X | X |   |
| Yellow Bullhead      |      |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |   |

NON-MONITORING

Table 29. Number, percent composition, and density of fish captured in the Gila River at Iron Bridge in 2021.

| Species          | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|------------------|---------------|---------------------|------------------------------------|
| <b>Native</b>    |               |                     |                                    |
| Loach Minnow     | 9             | 81.82               | 10.60                              |
| Longfin Dace     | 1             | 9.09                | 1.18                               |
| <b>Nonnative</b> |               |                     |                                    |
| Channel Catfish  | 1             | 9.09                | 1.18                               |

Table 30. Area sampled, habitat composition, depth (mean ± standard error (SE), if n > 1), and mean velocity (mean ± SE, if n > 1) of all habitat types sampled within the Gila River at Iron Bridge in 2021

| Habitat Type | Area Sampled (m <sup>2</sup> ) | Composition (%) | Depth (m)   | Velocity (m/s) |
|--------------|--------------------------------|-----------------|-------------|----------------|
| Riffle       | 49                             | 57.51           | 0.31 ± 0.00 | 0.98 ± 0.00    |
| Run          | 36                             | 42.49           | 0.21 ± 0.00 | 0.65 ± 0.00    |

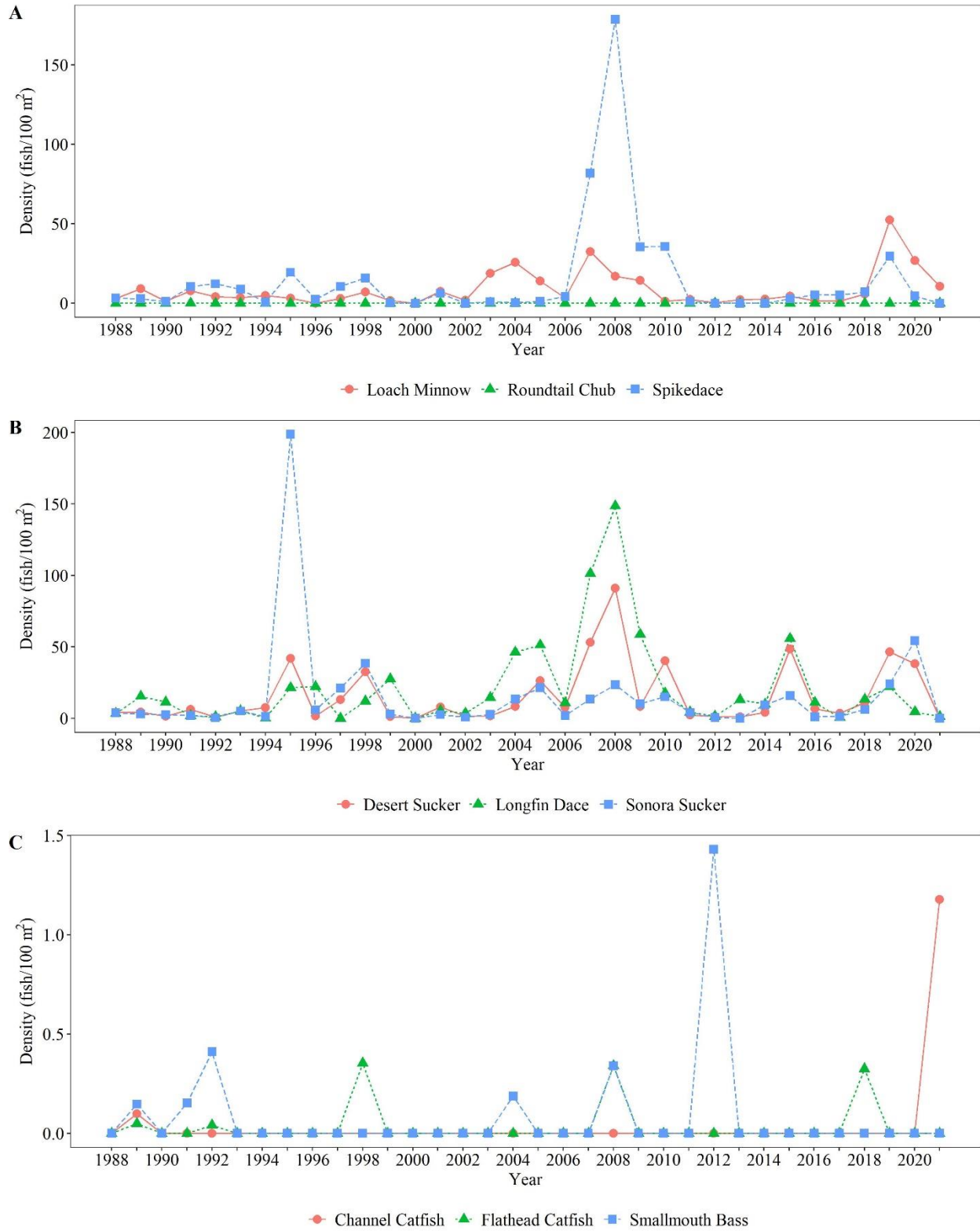


Figure 17. Density of fish species captured at Gila River at Iron Bridge site from 1988 to 2021. For clarity, charts are split into priority species (A), all other native species (B), and prominent concerning nonnative species (C).

*Gila River—Cherokee Canyon*

Sampling at the Gila River Cherokee Canyon site began in 2009. Several native fish species have commonly been collected at the site (Table 31 and A7). Desert Sucker were consistently captured each year from 2014 until 2020. Several nonnative fish species were present in 2021, including Channel Catfish *Ictalurus punctatus*, Common Carp, Red Shiner *Cyprinella lutrensis*, and Yellow Bullhead (Table 32). Loach Minnow density decreased sharply from the previous year and no Spikedace were collected in 2021. (Figure 18). Runs were the most common habitat sampled in 2021 (Table 33).

Table 31. Occurrence of fishes at the Gila River Cherokee site, Grant County, New Mexico, 2009–2021. X indicates species presence.

| Species              | Year |    |    |    |    |    |    |    |    |    |    |    |    |
|----------------------|------|----|----|----|----|----|----|----|----|----|----|----|----|
|                      | 09   | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| <b>Native</b>        |      |    |    |    |    |    |    |    |    |    |    |    |    |
| Desert Sucker        | X    | X  | X  | X  |    | X  | X  | X  | X  | X  | X  | X  |    |
| Loach Minnow         | X    | X  | X  | X  |    |    | X  | X  | X  | X  | X  | X  | X  |
| Longfin Dace         | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| Sonora Sucker        | X    | X  | X  | X  |    | X  | X  | X  | X  | X  | X  | X  | X  |
| Spikedace            | X    | X  | X  |    |    |    |    |    | X  |    | X  | X  |    |
| <b>Nonnative</b>     |      |    |    |    |    |    |    |    |    |    |    |    |    |
| Channel Catfish      |      |    |    |    |    |    |    |    | X  |    | X  |    | X  |
| Common Carp          |      |    |    |    |    |    |    |    | X  |    | X  |    | X  |
| Fathead Minnow       | X    |    |    |    |    | X  |    |    |    | X  | X  | X  |    |
| Flathead Catfish     |      |    | X  | X  |    | X  | X  |    | X  |    |    |    |    |
| Red Shiner           |      |    |    |    |    |    |    |    |    | X  | X  | X  | X  |
| Western Mosquitofish | X    |    | X  | X  | X  |    | X  | X  | X  | X  | X  |    |    |
| Yellow Bullhead      |      | X  |    |    |    |    |    |    |    |    |    |    | X  |

Table 32. Number, percent composition, and density of fish captured in the Gila River at Cherokee Canyon in 2021.

| Species          | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|------------------|---------------|---------------------|------------------------------------|
| <b>Native</b>    |               |                     |                                    |
| Loach Minnow     | 7             | 21.21               | 1.50                               |
| Longfin Dace     | 4             | 12.12               | 0.86                               |
| Sonora Sucker    | 3             | 9.09                | 0.64                               |
| <b>Nonnative</b> |               |                     |                                    |
| Channel Catfish  | 4             | 12.12               | 0.86                               |
| Common Carp      | 6             | 18.18               | 1.29                               |
| Red Shiner       | 8             | 24.24               | 1.71                               |
| Yellow Bullhead  | 1             | 3.03                | 0.21                               |

Table 33. Area sampled, habitat composition, depth (mean  $\pm$  standard error (SE), if  $n > 1$ ), and mean velocity (mean  $\pm$  SE, if  $n > 1$ ) of all habitat types sampled within the Gila River at Cherokee Canyon in 2021.

| Habitat Type | Area Sampled (m <sup>2</sup> ) | Composition (%) | Depth (m)       | Velocity (m/s)  |
|--------------|--------------------------------|-----------------|-----------------|-----------------|
| Pool         | 92                             | 19.71           | 0.65 $\pm$ 0.00 | 0.58 $\pm$ 0.00 |
| Riffle       | 74                             | 15.79           | 0.24 $\pm$ 0.01 | 0.79 $\pm$ 0.03 |
| Run          | 267                            | 57.10           | 0.38 $\pm$ 0.00 | 0.57 $\pm$ 0.04 |
| Shoal        | 35                             | 7.40            | 0.22 $\pm$ 0.00 | 0.39 $\pm$ 0.00 |



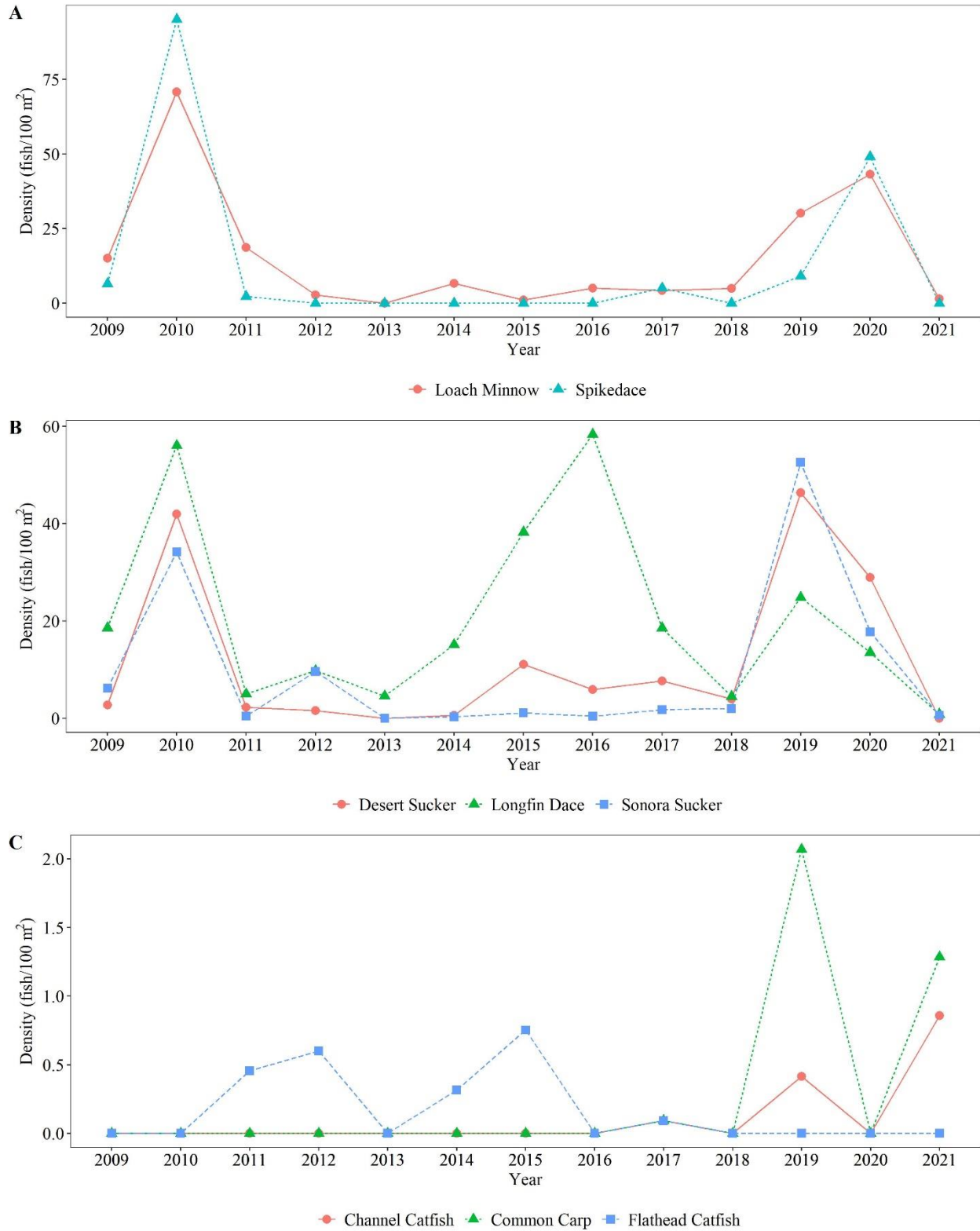


Figure 18. Density of fish species captured at Gila River at Cherokee Canyon site from 2009 to 2021. For clarity, charts are split into priority species (A), all other native species (B), and prominent concerning nonnative species (C).

*Gila River—Ash Canyon*

Sampling began at the Gila River Middle Box site in 1997. To allow for better access, the site was shifted slightly downstream from its original location to the Ash Canyon confluence in 2012. The new site, located on the Department’s Redrock property, has similar characteristics to the original site and data from the two sites have been combined for long term reporting. Since 1997, 11 fish species have been collected at the site (Table 34 and A8). Red Shiner was the most abundant species captured in 2021 (Table 35). Density of Loach Minnow was low compared to that of recent years (Figure 19). Runs were the most common habitat sampled within the site (Table 36).

Table 34. Occurrence of fishes at the Gila River Ash Canyon site, Grant County, New Mexico, 2012–2021. X indicates species presence.

| Species              | Year |    |    |               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
|----------------------|------|----|----|---------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
|                      | 97   | 98 | 99 | 00            | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |   |
| <b>Native</b>        |      |    |    |               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
| Desert Sucker        | X    | X  | X  | NO MONITORING |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
| Loach Minnow         | X    | X  | X  | X             | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X |
| Longfin Dace         | X    | X  | X  | X             | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X |
| Sonora Sucker        | X    | X  | X  | X             | X  | X  |    |    |    |    | X  | X  | X  | X  |    |    | X  | X  | X  |    |    | X  | X  |    |    |   |
| Spikedace            | X    | X  | X  | X             |    | X  | X  |    |    |    | X  |    | X  |    |    |    |    |    |    |    |    |    |    |    | X  |   |
| <b>Nonnative</b>     |      |    |    |               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
| Channel Catfish      |      | X  | X  | X             | X  | X  | X  | X  |    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X |
| Common Carp          |      |    |    |               |    |    |    |    |    | X  |    |    | X  |    | X  |    | X  |    |    | X  |    |    |    |    | X  |   |
| Fathead Minnow       |      | X  |    | X             |    | X  | X  | X  |    | X  | X  | X  | X  | X  | X  | X  |    |    | X  |    | X  |    |    |    | X  |   |
| Flathead Catfish     |      |    |    | X             | X  | X  |    | X  |    |    |    | X  |    | X  |    | X  |    | X  |    | X  |    |    |    |    | X  |   |
| Red Shiner           | X    | X  | X  | X             | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X |
| Western Mosquitofish |      |    |    | X             | X  | X  |    |    |    |    | X  |    | X  |    | X  |    |    |    | X  |    | X  | X  | X  |    | X  |   |

Table 35. Number, percent composition, and density of fish captured in the Gila River at Ash Canyon in 2021.

| Species          | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|------------------|---------------|---------------------|------------------------------------|
| <b>Native</b>    |               |                     |                                    |
| Loach Minnow     | 1             | 5.56                | 0.27                               |
| Longfin Dace     | 1             | 5.56                | 0.27                               |
| <b>Nonnative</b> |               |                     |                                    |
| Channel Catfish  | 3             | 16.67               | 0.81                               |
| Red Shiner       | 13            | 72.22               | 3.50                               |

Table 36. Area sampled, habitat composition, depth (mean ± standard error (SE), if n > 1), and mean velocity (mean ± SE, if n > 1) of all habitat types sampled within the Gila River at Ash Canyon in 2021.

| Habitat Type | Area Sampled (m <sup>2</sup> ) | Composition (%) | Depth (m)   | Velocity (m/s) |
|--------------|--------------------------------|-----------------|-------------|----------------|
| Riffle       | 147                            | 39.46           | 0.29 ± 0.00 | 0.80 ± 0.00    |
| Run          | 183                            | 49.16           | 0.31 ± 0.00 | 0.34 ± 0.00    |
| Shoal        | 42                             | 11.38           | 0.25 ± 0.00 | 0.51 ± 0.00    |

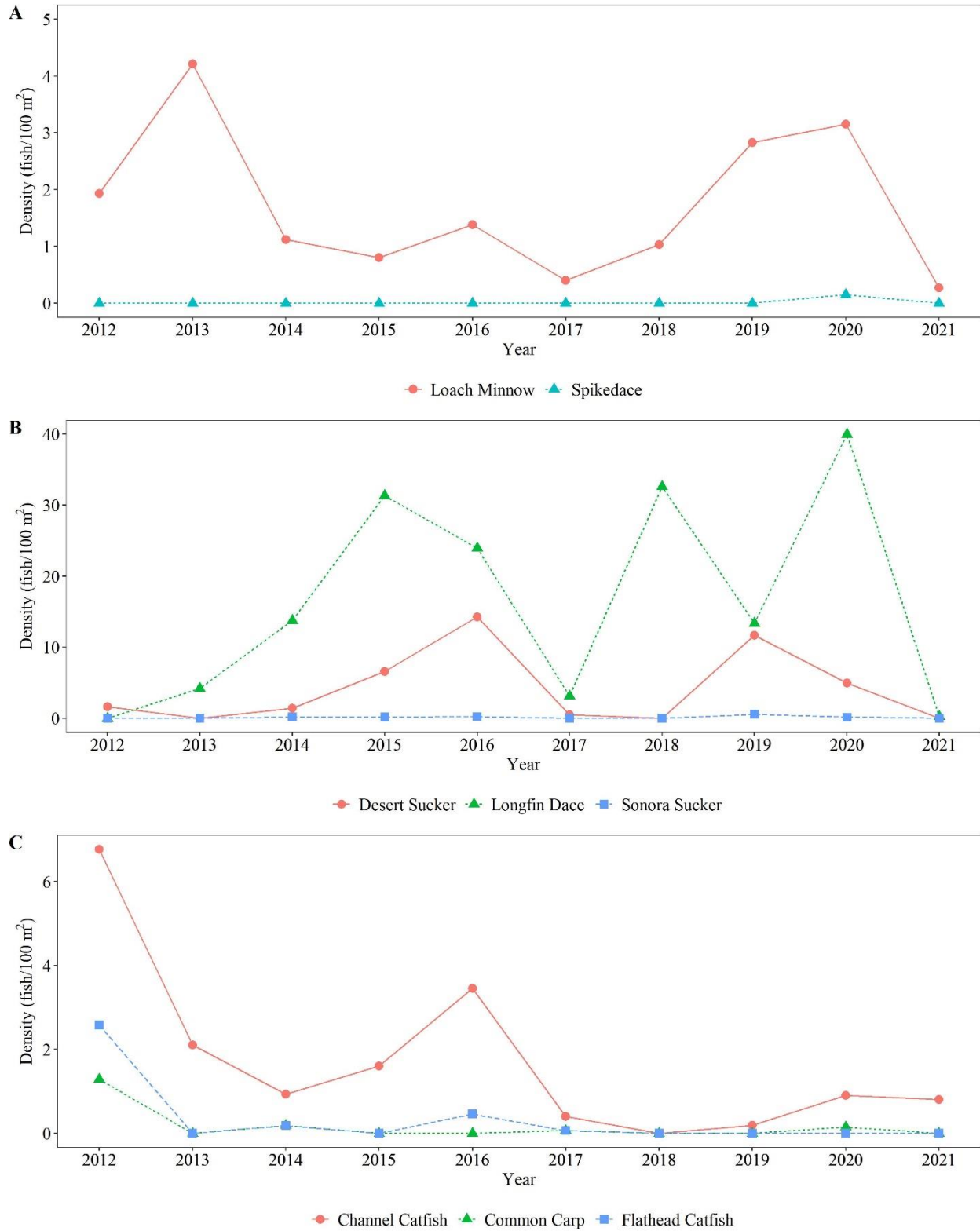


Figure 19. Density of fish species captured at Gila River at Ash Canyon site from 2012 to 2021. For clarity, charts are split into priority species (A), all other native species (B), and prominent concerning nonnative species (C).

*Gila River—Sunset Diversion*

Sunset Diversion is the newest permanent monitoring site, with sampling beginning in 2010. The Gila River Sunset Diversion was selected as a replacement for the Fisherman’s Overlook site due to limited accessibility. Data from the Sunset Diversion and Fisherman’s Overlook sites have not been combined due to differences between habitats at each site caused by the diversion. Only three native fish species have been collected at the site since 2010 (Table 37 and A9). No water was flowing over the diversion in 2021, and habitat below the diversion was maintained only by seepage through the diversion. Most species previously captured were present in 2021, excluding Sonora Sucker and Common Carp. The most abundant species captured was Red Shiner (Table 38). Longfin Dace were not captured in 2020 and density remained low in 2021 (Figure 20). Run habitat below the diversion made up 76.1% of the habitat sampled (Table 39).

Table 37. Occurrence of fishes at the Gila River Sunset Diversion site, Hidalgo County, New Mexico, 2010–2021. X indicates species presence.

| Species              | Year |    |    |    |    |               |    |    |    |    |    |    |   |
|----------------------|------|----|----|----|----|---------------|----|----|----|----|----|----|---|
|                      | 10   | 11 | 12 | 13 | 14 | 15            | 16 | 17 | 18 | 19 | 20 | 21 |   |
| <b>Native</b>        |      |    |    |    |    |               |    |    |    |    |    |    |   |
| Desert Sucker        |      | X  |    |    | X  | NO MONITORING | X  | X  |    | X  |    | X  |   |
| Longfin Dace         |      | X  |    |    | X  |               | X  | X  | X  | X  |    | X  |   |
| Sonora Sucker        |      |    |    |    |    |               |    | X  |    |    |    |    |   |
| <b>Nonnative</b>     |      |    |    |    |    |               |    |    |    |    |    |    |   |
| Black Bullhead       |      |    |    |    |    |               |    |    |    |    |    |    | X |
| Channel Catfish      | X    | X  | X  |    | X  |               |    | X  | X  | X  |    |    | X |
| Common Carp          |      |    |    |    | X  |               |    | X  |    |    |    |    |   |
| Fathead Minnow       |      |    |    |    | X  |               |    | X  | X  |    | X  |    | X |
| Flathead Catfish     |      |    |    |    | X  |               |    | X  | X  |    |    |    | X |
| Red Shiner           | X    | X  |    |    | X  |               |    | X  | X  | X  | X  |    | X |
| Western Mosquitofish |      | X  |    | X  |    |               | X  | X  |    | X  | X  | X  |   |

Table 38. Number, percent composition, and density of fish captured in the Gila River at Sunset Diversion in 2021.

| Species              | Number Caught | Percent Composition | Density (fish/100 m <sup>2</sup> ) |
|----------------------|---------------|---------------------|------------------------------------|
| <b>Native</b>        |               |                     |                                    |
| Desert Sucker        | 2             | 1.83                | 0.49                               |
| Longfin Dace         | 5             | 4.59                | 1.22                               |
| <b>Nonnative</b>     |               |                     |                                    |
| Black Bullhead       | 2             | 1.83                | 0.49                               |
| Channel Catfish      | 28            | 25.69               | 6.81                               |
| Fathead Minnow       | 3             | 2.75                | 0.73                               |
| Flathead Catfish     | 1             | 0.92                | 0.24                               |
| Red Shiner           | 65            | 59.63               | 15.81                              |
| Western Mosquitofish | 3             | 2.75                | 0.73                               |

Table 39. Area sampled, habitat composition, depth (mean  $\pm$  standard error (SE), if  $n > 1$ ), and mean velocity (mean  $\pm$  SE, if  $n > 1$ ) of all habitat types sampled within the Gila River at Sunset Diversion in 2021.

| Habitat Type | Area Sampled (m <sup>2</sup> ) | Composition (%) | Depth (m)       | Velocity (m/s)  |
|--------------|--------------------------------|-----------------|-----------------|-----------------|
| Pool         | 45                             | 10.88           | 0.54 $\pm$ 0.00 | 0.01 $\pm$ 0.00 |
| Riffle       | 53                             | 13.01           | 0.21 $\pm$ 0.01 | 0.59 $\pm$ 0.01 |
| Run          | 313                            | 76.11           | 0.30 $\pm$ 0.01 | 0.53 $\pm$ 0.01 |

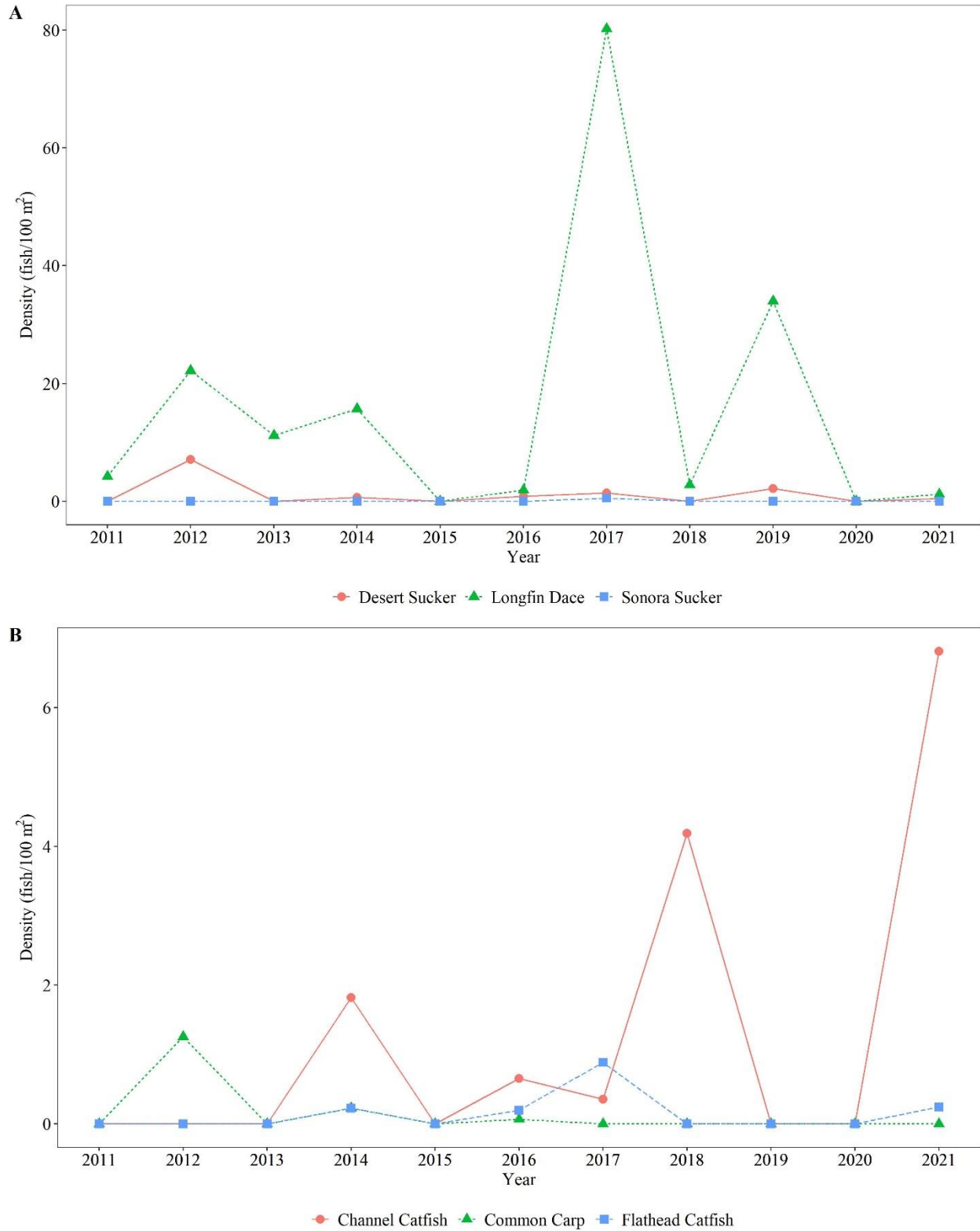


Figure 20. Density of fish species captured at Gila River below Sunset Diversion site from 2011 to 2021. For clarity, charts are split into native species (A), and prominent concerning nonnative species (B). No priority species have ever been captured at this site.

## **Recommendations**

- The permanent site long term dataset is essential to track changes in presence and density of native fishes in the Gila River Basin and should be continued annually.

## **Work Planned for 2022**

- Permanent site monitoring is not be continued under this Agreement in 2022.

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**APPENDIX A.**  
**FISH CAPTURES AND DENSITIES AT LONG-TERM GILA RIVER BASIN PERMANENT SITE MONITORING.**

Table A1. Number (N) and density (fish/100 m<sup>2</sup>) of fishes collected in the Tularosa River at the Eagle Peak Road site, 1988 - 2021. Native species are bolded.

| Species              | 1988  |         | 1989  |         | 1990  |         | 1991  |         | 1992  |         |
|----------------------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|
|                      | N     | Density | N     | Density | N     | Density | N     | Density | N     | Density |
| Brook Stickleback    | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b> | 147   | 20.89   | 134   | 20.20   | 66    | 10.55   | 161   | 26.11   | 138   | 23.07   |
| Fathead Minnow       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 1     | 0.17    |
| Green Sunfish        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>  | 77    | 10.94   | 89    | 13.41   | 46    | 7.36    | 99    | 16.05   | 126   | 21.07   |
| <b>Longfin Dace</b>  | 360   | 51.15   | 631   | 95.11   | 271   | 43.33   | 660   | 107.02  | 318   | 53.17   |
| Rainbow Trout        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b> | 27    | 3.84    | 76    | 11.46   | 42    | 6.72    | 153   | 24.81   | 127   | 21.23   |
| <b>Speckled Dace</b> | 16    | 2.27    | 63    | 9.50    | 27    | 4.32    | 101   | 16.38   | 81    | 13.54   |
| Western Mosquitofish | 0     | 0       | 2     | 0.30    | 0     | 0       | 2     | 0.32    | 62    | 10.37   |
| Total N              | 627   |         | 995   |         | 452   |         | 1176  |         | 853   |         |
| Area                 | 703.8 |         | 663.4 |         | 625.4 |         | 616.7 |         | 598.1 |         |
| Density              | 89.1  |         | 150.0 |         | 72.3  |         | 190.7 |         | 142.6 |         |

| Species              | 1993  |         | 1994  |         | 1995  |         | 1996  |         | 1997  |         |
|----------------------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|
|                      | N     | Density | N     | Density | N     | Density | N     | Density | N     | Density |
| Brook Stickleback    | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b> | 173   | 32.47   | 103   | 24.41   | 285   | 133.40  | 55    | 17.21   | 25    | 7.58    |
| Fathead Minnow       | 0     | 0       | 0     | 0       | 0     | 0       | 2     | 0.63    | 2     | 0.61    |
| Green Sunfish        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>  | 60    | 11.26   | 31    | 7.35    | 70    | 32.76   | 24    | 7.51    | 22    | 6.67    |
| <b>Longfin Dace</b>  | 197   | 36.97   | 193   | 45.75   | 381   | 178.33  | 181   | 56.64   | 70    | 21.23   |
| Rainbow Trout        | 0     | 0       | 0     | 0       | 0     | 0       | 1     | 0.31    | 0     | 0       |
| <b>Sonora Sucker</b> | 27    | 5.07    | 33    | 7.82    | 81    | 37.91   | 47    | 14.71   | 53    | 16.08   |
| <b>Speckled Dace</b> | 21    | 3.94    | 14    | 3.32    | 77    | 36.04   | 56    | 17.52   | 56    | 16.99   |
| Western Mosquitofish | 0     | 0       | 1     | 0.24    | 0     | 0       | 1     | 0.31    | 0     | 0       |
| Total N              | 478   |         | 375   |         | 894   |         | 367   |         | 228   |         |
| Area                 | 532.8 |         | 421.9 |         | 213.7 |         | 319.6 |         | 329.7 |         |
| Density              | 89.7  |         | 88.9  |         | 418.4 |         | 114.8 |         | 69.2  |         |

Table A1 continued. Tularosa River at Eagle Peak Road site.

| Species              | 1998   |         | 1999  |         | 2000  |         | 2001  |         | 2002  |         |
|----------------------|--------|---------|-------|---------|-------|---------|-------|---------|-------|---------|
|                      | N      | Density | N     | Density | N     | Density | N     | Density | N     | Density |
| Brook Stickleback    | 0      | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 1     | 0.29    |
| <b>Desert Sucker</b> | 31     | 16.69   | 44    | 14.77   | 0     | 0       | 20    | 5.27    | 111   | 32.64   |
| Fathead Minnow       | 0      | 0       | 0     | 0       | 0     | 0       | 2     | 0.53    | 13    | 3.82    |
| Green Sunfish        | 0      | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>  | 19     | 10.23   | 3     | 1.01    | 0     | 0       | 1     | 0.26    | 1     | 0.29    |
| <b>Longfin Dace</b>  | 136    | 73.24   | 88    | 29.54   | 35    | 18.71   | 29    | 7.65    | 52    | 15.29   |
| Rainbow Trout        | 0      | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b> | 49     | 26.39   | 67    | 22.49   | 26    | 13.90   | 50    | 13.19   | 43    | 12.64   |
| <b>Speckled Dace</b> | 148    | 79.70   | 91    | 30.55   | 26    | 13.90   | 65    | 17.14   | 49    | 14.41   |
| Western Mosquitofish | 0      | 0       | 0     | 0       | 6     | 3.21    | 19    | 5.01    | 4     | 1.18    |
| Total N              | 383    |         | 293   |         | 93    |         | 186   |         | 274   |         |
| Area                 | 185.7  |         | 297.9 |         | 187.0 |         | 379.2 |         | 340.1 |         |
| Density              | 206.25 |         | 98.35 |         | 49.72 |         | 49.05 |         | 80.57 |         |

| Species              | 2003   |         | 2004   |         | 2005   |         | 2006  |         | 2007  |         |
|----------------------|--------|---------|--------|---------|--------|---------|-------|---------|-------|---------|
|                      | N      | Density | N      | Density | N      | Density | N     | Density | N     | Density |
| Brook Stickleback    | 0      | 0       | 0      | 0       | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b> | 60     | 24.54   | 36     | 11.70   | 31     | 16.04   | 22    | 6.80    | 22    | 6.33    |
| Fathead Minnow       | 0      | 0       | 0      | 0       | 0      | 0       | 0     | 0       | 10    | 2.88    |
| Green Sunfish        | 0      | 0       | 0      | 0       | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>  | 0      | 0       | 0      | 0       | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>  | 331    | 135.38  | 223    | 72.45   | 134    | 69.35   | 86    | 26.60   | 178   | 51.25   |
| Rainbow Trout        | 0      | 0       | 0      | 0       | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b> | 56     | 22.90   | 39     | 12.67   | 14     | 7.25    | 13    | 4.02    | 50    | 14.40   |
| <b>Speckled Dace</b> | 54     | 22.09   | 92     | 29.89   | 73     | 37.78   | 49    | 15.16   | 76    | 21.88   |
| Western Mosquitofish | 55     | 22.50   | 14     | 4.55    | 0      | 0       | 0     | 0       | 4     | 1.15    |
| Total N              | 556    |         | 404    |         | 252    |         | 170   |         | 340   |         |
| Area                 | 244.5  |         | 307.8  |         | 193.2  |         | 323.3 |         | 347.3 |         |
| Density              | 227.41 |         | 131.26 |         | 130.41 |         | 52.58 |         | 97.90 |         |

Table A1 continued. Tularosa River at Eagle Peak Road site.

| Species              | 2008   |         | 2009   |         | 2010   |         | 2011  |         | 2012   |         |
|----------------------|--------|---------|--------|---------|--------|---------|-------|---------|--------|---------|
|                      | N      | Density | N      | Density | N      | Density | N     | Density | N      | Density |
| Brook Stickleback    | 0      | 0       | 0      | 0       | 2      | 0.80    | 0     | 0       | 1      | 0.35    |
| <b>Desert Sucker</b> | 81     | 19.57   | 43     | 16.99   | 139    | 55.46   | 37    | 15.56   | 114    | 40.04   |
| Fathead Minnow       | 0      | 0       | 0      | 0       | 4      | 1.60    | 0     | 0       | 6      | 2.11    |
| Green Sunfish        | 0      | 0       | 0      | 0       | 0      | 0       | 0     | 0       | 2      | 0.70    |
| <b>Loach Minnow</b>  | 1      | 0.24    | 0      | 0       | 3      | 1.20    | 0     | 0       | 0      | 0       |
| <b>Longfin Dace</b>  | 356    | 86.01   | 365    | 144.23  | 222    | 88.58   | 66    | 27.76   | 57     | 20.02   |
| Rainbow Trout        | 0      | 0       | 0      | 0       | 0      | 0       | 0     | 0       | 0      | 0       |
| <b>Sonora Sucker</b> | 60     | 14.50   | 57     | 22.52   | 80     | 31.92   | 21    | 8.83    | 69     | 24.23   |
| <b>Speckled Dace</b> | 177    | 42.76   | 78     | 30.82   | 130    | 51.87   | 57    | 23.98   | 107    | 37.58   |
| Western Mosquitofish | 2      | 0.48    | 10     | 3.95    | 4      | 1.60    | 0     | 0       | 5      | 1.76    |
| Total N              | 677    |         | 553    |         | 584    |         | 181   |         | 361    |         |
| Area                 | 413.9  |         | 253.1  |         | 250.6  |         | 237.7 |         | 284.7  |         |
| Density              | 163.56 |         | 218.52 |         | 233.02 |         | 76.14 |         | 126.78 |         |

| Species              | 2013  |         | 2014   |         | 2015   |         | 2016   |         | 2017   |         |
|----------------------|-------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
|                      | N     | Density | N      | Density | N      | Density | N      | Density | N      | Density |
| Brook Stickleback    | 2     | 0.28    | 0      | 0       | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Desert Sucker</b> | 8     | 1.13    | 54     | 14.60   | 63     | 18.26   | 2      | 0.82    | 24     | 8.32    |
| Fathead Minnow       | 1     | 0.14    | 2      | 0.54    | 2      | 0.58    | 5      | 2.04    | 0      | 0       |
| Green Sunfish        | 0     | 0       | 0      | 0       | 0      | 0       | 1      | 0.41    | 0      | 0       |
| <b>Loach Minnow</b>  | 0     | 0       | 0      | 0       | 4      | 1.16    | 0      | 0       | 17     | 5.89    |
| <b>Longfin Dace</b>  | 6     | 0.85    | 435    | 117.58  | 410    | 118.80  | 1293   | 527.69  | 620    | 214.86  |
| Rainbow Trout        | 0     | 0       | 0      | 0       | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Sonora Sucker</b> | 3     | 0.42    | 115    | 31.08   | 53     | 15.36   | 35     | 14.28   | 5      | 1.73    |
| <b>Speckled Dace</b> | 12    | 1.70    | 13     | 3.51    | 28     | 8.11    | 18     | 7.35    | 0      | 0       |
| Western Mosquitofish | 0     | 0       | 0      | 0       | 0      | 0       | 50     | 20.41   | 0      | 0       |
| Total N              | 32    |         | 619    |         | 560    |         | 1404   |         | 666    |         |
| Area                 | 707.0 |         | 370.0  |         | 345.1  |         | 245.0  |         | 288.6  |         |
| Density              | 4.53  |         | 167.31 |         | 162.27 |         | 572.99 |         | 230.80 |         |

Table A1 continued. Tularosa River at Eagle Peak Road site.

| Species              | 2018  |         | 2019  |         | 2020   |         | 2021   |         |
|----------------------|-------|---------|-------|---------|--------|---------|--------|---------|
|                      | N     | Density | N     | Density | N      | Density | N      | Density |
| Brook Stickleback    | 0     | 0       | 0     | 0       | 0      | 0       | 0      | 0       |
| <b>Desert Sucker</b> | 4     | 6.38    | 4     | 4.89    | 81     | 45.69   | 82     | 35.06   |
| Fathead Minnow       | 0     | 0       | 0     | 0       | 0      | 0       | 1      | 0.43    |
| Green Sunfish        | 0     | 0       | 0     | 0       | 0      | 0       | 0      | 0       |
| <b>Loach Minnow</b>  | 1     | 1.59    | 0     | 0       | 1      | 0.56    | 0      | 0       |
| <b>Longfin Dace</b>  | 3     | 4.78    | 1     | 1.22    | 202    | 113.95  | 143    | 61.14   |
| Rainbow Trout        | 0     | 0       | 0     | 0       | 0      | 0       | 0      | 0       |
| <b>Sonora Sucker</b> | 0     | 0       | 2     | 2.45    | 123    | 69.39   | 95     | 40.62   |
| <b>Speckled Dace</b> | 0     | 0       | 2     | 2.45    | 40     | 22.57   | 12     | 5.13    |
| Western Mosquitofish | 0     | 0       | 0     | 0       | 0      | 0       | 0      | 0       |
| Total N              | 8     |         | 9     |         | 447    |         | 333    |         |
| Area                 | 62.72 |         | 81.78 |         | 177.26 |         | 233.87 |         |
| Density              | 12.75 |         | 11.01 |         | 252.17 |         | 142.38 |         |

Table A2. Number (N) and density (fish/100 m<sup>2</sup>) of fishes collected in the San Francisco River at the Glenwood Ranger Station site, 1997 - 2021. Native species are bolded. Note that no sampling occurred in 2000 and 2012 at this site.

| Species              | 1997   |         | 1998   |         | 1999  |         | 2000 |         | 2001  |         |
|----------------------|--------|---------|--------|---------|-------|---------|------|---------|-------|---------|
|                      | N      | Density | N      | Density | N     | Density | N    | Density | N     | Density |
| <b>Desert Sucker</b> | 311    | 63.51   | 204    | 81.90   | 5     | 1.51    |      |         | 30    | 10.02   |
| Fathead Minnow       | 0      | 0       | 5      | 2.01    | 2     | 0.61    |      |         | 0     | 0       |
| <b>Loach Minnow</b>  | 96     | 19.61   | 72     | 28.90   | 14    | 4.24    |      |         | 44    | 14.70   |
| <b>Longfin Dace</b>  | 276    | 56.36   | 102    | 40.95   | 14    | 4.24    |      |         | 0     | 0       |
| Rainbow Trout        | 0      | 0       | 0      | 0       | 0     | 0       |      |         | 1     | 0.33    |
| Smallmouth Bass      | 0      | 0       | 0      | 0       | 0     | 0       |      |         | 0     | 0       |
| <b>Sonora Sucker</b> | 220    | 44.93   | 172    | 69.05   | 45    | 13.63   |      |         | 14    | 4.68    |
| <b>Speckled Dace</b> | 127    | 25.94   | 85     | 34.12   | 25    | 7.57    |      |         | 66    | 22.05   |
| <b>Spikedace</b>     | 0      | 0       | 0      | 0       | 0     | 0       |      |         | 0     | 0       |
| Western Mosquitofish | 0      | 0       | 2      | 0.80    | 3     | 0.91    |      |         | 0     | 0       |
| Total N              | 1030   |         | 642    |         | 108   |         |      |         | 155   |         |
| Area                 | 489.7  |         | 249.1  |         | 330.1 |         |      |         | 299.3 |         |
| Density              | 210.35 |         | 257.73 |         | 32.72 |         |      |         | 51.78 |         |

| Species              | 2002  |         | 2003  |         | 2004  |         | 2005  |         | 2006  |         |
|----------------------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|
|                      | N     | Density | N     | Density | N     | Density | N     | Density | N     | Density |
| <b>Desert Sucker</b> | 69    | 21.17   | 9     | 4.37    | 24    | 5.44    | 18    | 7.49    | 3     | 1.63    |
| Fathead Minnow       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>  | 27    | 8.28    | 14    | 6.80    | 23    | 5.21    | 58    | 24.13   | 11    | 5.99    |
| <b>Longfin Dace</b>  | 0     | 0       | 4     | 1.94    | 0     | 0       | 1     | 0.42    | 0     | 0       |
| Rainbow Trout        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Smallmouth Bass      | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b> | 8     | 2.45    | 31    | 15.05   | 13    | 2.95    | 16    | 6.66    | 10    | 5.45    |
| <b>Speckled Dace</b> | 30    | 9.20    | 20    | 9.71    | 13    | 2.95    | 12    | 4.99    | 18    | 9.81    |
| <b>Spikedace</b>     | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish | 0     | 0       | 12    | 5.82    | 0     | 0       | 0     | 0       | 0     | 0       |
| Total N              | 134   |         | 90    |         | 73    |         | 105   |         | 42    |         |
| Area                 | 325.9 |         | 206.0 |         | 441.3 |         | 240.3 |         | 183.5 |         |
| Density              | 41.11 |         | 43.69 |         | 16.54 |         | 43.69 |         | 22.89 |         |

Table A2 continued. San Francisco River at the Glenwood Ranger Station site.

| Species              | 2007  |         | 2008   |         | 2009  |         | 2010  |         | 2011  |         |
|----------------------|-------|---------|--------|---------|-------|---------|-------|---------|-------|---------|
|                      | N     | Density | N      | Density | N     | Density | N     | Density | N     | Density |
| <b>Desert Sucker</b> | 39    | 13.20   | 46     | 29.60   | 35    | 9.12    | 18    | 4.20    | 49    | 16.34   |
| Fathead Minnow       | 2     | 0.68    | 0      | 0       | 1     | 0.26    | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>  | 26    | 8.80    | 32     | 20.59   | 45    | 11.72   | 81    | 18.90   | 26    | 8.67    |
| <b>Longfin Dace</b>  | 1     | 0.34    | 30     | 19.30   | 141   | 36.73   | 10    | 2.33    | 3     | 1.00    |
| Rainbow Trout        | 0     | 0       | 0      | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Smallmouth Bass      | 0     | 0       | 0      | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b> | 22    | 7.45    | 34     | 21.88   | 47    | 12.24   | 22    | 5.13    | 19    | 6.34    |
| <b>Speckled Dace</b> | 48    | 16.25   | 41     | 26.38   | 63    | 16.41   | 43    | 10.04   | 59    | 19.68   |
| <b>Spikedace</b>     | 0     | 0       | 0      | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish | 0     | 0       | 0      | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Total N              | 138   |         | 183    |         | 332   |         | 174   |         | 156   |         |
| Area                 | 295.5 |         | 155.4  |         | 383.9 |         | 428.5 |         | 299.9 |         |
| Density              | 46.71 |         | 117.74 |         | 86.49 |         | 40.61 |         | 52.02 |         |

| Species              | 2012 |         | 2013 |         | 2014   |         | 2015  |         | 2016  |         |
|----------------------|------|---------|------|---------|--------|---------|-------|---------|-------|---------|
|                      | N    | Density | N    | Density | N      | Density | N     | Density | N     | Density |
| <b>Desert Sucker</b> |      |         | 0    | 0       | 11     | 0.93    | 78    | 9.81    | 158   | 26.57   |
| Fathead Minnow       |      |         | 1    | 3.00    | 13     | 1.09    | 2     | 0.25    | 1     | 0.17    |
| <b>Loach Minnow</b>  |      |         | 0    | 0       | 0      | 0       | 47    | 5.91    | 53    | 8.91    |
| <b>Longfin Dace</b>  |      |         | 0    | 0       | 23     | 1.93    | 97    | 12.20   | 71    | 11.94   |
| Rainbow Trout        |      |         | 0    | 0       | 1      | 0.08    | 0     | 0       | 0     | 0       |
| Smallmouth Bass      |      |         | 0    | 0       | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b> |      |         | 0    | 0       | 56     | 4.71    | 83    | 10.44   | 159   | 26.74   |
| <b>Speckled Dace</b> |      |         | 0    | 0       | 0      | 0       | 2     | 0.25    | 3     | 0.50    |
| <b>Spikedace</b>     |      |         | 0    | 0       | 0      | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish |      |         | 0    | 0       | 0      | 0       | 0     | 0       | 0     | 0       |
| Total N              |      |         | 1    |         | 104    |         | 309   |         | 445   |         |
| Area                 |      |         | 33.3 |         | 1188.7 |         | 795.1 |         | 594.6 |         |
| Density              |      |         | 3.00 |         | 8.75   |         | 38.86 |         | 74.84 |         |

Table A2 continued. San Francisco River at the Glenwood Ranger Station site.

| Species              | 2017   |         | 2018  |         | 2019   |         | 2020   |         | 2021  |         |
|----------------------|--------|---------|-------|---------|--------|---------|--------|---------|-------|---------|
|                      | N      | Density | N     | Density | N      | Density | N      | Density | N     | Density |
| <b>Desert Sucker</b> | 26     | 1.11    | 3     | 1.05    | 219    | 95.05   | 268    | 122.72  | 28    | 9.67    |
| Fathead Minnow       | 0      | 0       | 0     | 0       | 0      | 0       | 0      | 0       | 0     | 0       |
| <b>Loach Minnow</b>  | 160    | 6.86    | 13    | 4.56    | 30     | 13.02   | 19     | 8.70    | 0     | 0       |
| <b>Longfin Dace</b>  | 38     | 1.63    | 11    | 3.86    | 33     | 14.32   | 97     | 44.42   | 1     | 0.35    |
| Rainbow Trout        | 0      | 0       | 0     | 0       | 0      | 0       | 0      | 0       | 0     | 0       |
| Smallmouth Bass      | 0      | 0       | 0     | 0       | 0      | 0       | 2      | 0.92    | 0     | 0       |
| <b>Sonora Sucker</b> | 19     | 0.81    | 9     | 3.16    | 83     | 36.02   | 108    | 49.45   | 9     | 3.11    |
| <b>Speckled Dace</b> | 11     | 0.47    | 24    | 8.42    | 52     | 22.57   | 32     | 14.65   | 3     | 1.04    |
| <b>Spikedace</b>     | 4      | 0.17    | 0     | 0       | 7      | 3.04    | 46     | 21.06   | 1     | 0.35    |
| Western Mosquitofish | 0      | 0       | 0     | 0       | 0      | 0       | 4      | 1.83    | 0     | 0       |
| Total N              | 258    |         | 60    |         | 424    |         | 576    |         | 42    |         |
| Area                 | 2333.6 |         | 284.9 |         | 230.4  |         | 218.4  |         | 289.6 |         |
| Density              | 11.06  |         | 21.06 |         | 184.02 |         | 263.76 |         | 14.50 |         |



Table A3. Number (N) and density (fish/100 m<sup>2</sup>) of fishes collected in the East Fork Gila River at the Fall Springs site, 1997 - 2021. Native species are bolded. No sampling occurred in 2018.

| Species               | 1997  |         | 1998   |         | 1999  |         |
|-----------------------|-------|---------|--------|---------|-------|---------|
|                       | N     | Density | N      | Density | N     | Density |
| Channel Catfish       | 0     | 0       | 0      | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 7     | 15.49   | 44     | 41.39   | 13    | 5.86    |
| Fathead Minnow        | 0     | 0       | 0      | 0       | 0     | 0       |
| Green Sunfish         | 0     | 0       | 0      | 0       | 0     | 0       |
| Ictalurus spp.        | 0     | 0       | 0      | 0       | 0     | 0       |
| Largemouth Bass       | 0     | 0       | 0      | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 0     | 0       | 5      | 4.70    | 0     | 0       |
| <b>Longfin Dace</b>   | 0     | 0       | 11     | 10.35   | 9     | 4.05    |
| <b>Roundtail Chub</b> | 11    | 24.34   | 2      | 1.88    | 1     | 0.45    |
| Smallmouth Bass       | 1     | 2.21    | 0      | 0       | 8     | 3.60    |
| <b>Sonora Sucker</b>  | 15    | 33.20   | 71     | 66.79   | 53    | 23.88   |
| <b>Speckled Dace</b>  | 0     | 0       | 0      | 0       | 0     | 0       |
| <b>Spikedace</b>      | 0     | 0       | 0      | 0       | 2     | 0.90    |
| Western Mosquitofish  | 0     | 0       | 18     | 16.93   | 0     | 0       |
| Yellow Bullhead       | 0     | 0       | 0      | 0       | 8     | 3.60    |
| Total N               | 34    |         | 151    |         | 94    |         |
| Area                  | 45.2  |         | 106.3  |         | 222.0 |         |
| Density               | 75.24 |         | 142.06 |         | 42.35 |         |

| Species               | 2000   |         | 2001  |         | 2002  |         |
|-----------------------|--------|---------|-------|---------|-------|---------|
|                       | N      | Density | N     | Density | N     | Density |
| Channel Catfish       | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 29     | 19.76   | 4     | 1.88    | 12    | 7.67    |
| Fathead Minnow        | 1      | 0.68    | 0     | 0       | 0     | 0       |
| Green Sunfish         | 0      | 0       | 0     | 0       | 0     | 0       |
| Ictalurus spp.        | 1      | 0.68    | 0     | 0       | 0     | 0       |
| Largemouth Bass       | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 100    | 68.12   | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 3      | 2.04    | 10    | 4.69    | 0     | 0       |
| Smallmouth Bass       | 3      | 2.04    | 10    | 4.69    | 15    | 9.58    |
| <b>Sonora Sucker</b>  | 43     | 29.29   | 35    | 16.41   | 19    | 12.14   |
| <b>Speckled Dace</b>  | 0      | 0       | 2     | 0.94    | 1     | 0.64    |
| <b>Spikedace</b>      | 5      | 3.41    | 0     | 0       | 0     | 0       |
| Western Mosquitofish  | 130    | 88.56   | 55    | 25.79   | 89    | 56.86   |
| Yellow Bullhead       | 0      | 0       | 2     | 0.94    | 0     | 0       |
| Total N               | 315    |         | 118   |         | 136   |         |
| Area                  | 146.8  |         | 213.3 |         | 156.5 |         |
| Density               | 214.59 |         | 55.33 |         | 86.89 |         |

Table A3 continued. East Fork Gila River at Fall Springs site.

| Species               | 2003  |         | 2004  |         | 2005  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density |
| Channel Catfish       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 3     | 2.03    | 5     | 5.74    | 66    | 36.93   |
| Fathead Minnow        | 0     | 0       | 0     | 0       | 0     | 0       |
| Green Sunfish         | 0     | 0       | 1     | 1.15    | 1     | 0.56    |
| Ictalurus spp.        | 0     | 0       | 2     | 2.30    | 7     | 3.92    |
| Largemouth Bass       | 0     | 0       | 0     | 0       | 1     | 0.56    |
| <b>Loach Minnow</b>   | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 0     | 0       | 0     | 0       | 14    | 7.83    |
| <b>Roundtail Chub</b> | 0     | 0       | 3     | 3.45    | 1     | 0.56    |
| Smallmouth Bass       | 5     | 3.38    | 1     | 1.15    | 10    | 5.60    |
| <b>Sonora Sucker</b>  | 5     | 3.38    | 27    | 31.02   | 20    | 11.19   |
| <b>Speckled Dace</b>  | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Spikedace</b>      | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish  | 27    | 18.27   | 4     | 4.60    | 0     | 0       |
| Yellow Bullhead       | 1     | 0.68    | 1     | 1.15    | 0     | 0       |
| Total N               | 41    |         | 44    |         | 120   |         |
| Area                  | 147.8 |         | 87.0  |         | 178.7 |         |
| Density               | 27.75 |         | 50.55 |         | 67.14 |         |

| Species               | 2006   |         | 2007   |         | 2008   |         |
|-----------------------|--------|---------|--------|---------|--------|---------|
|                       | N      | Density | N      | Density | N      | Density |
| Channel Catfish       | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Desert Sucker</b>  | 8      | 5.88    | 13     | 16.20   | 19     | 9.09    |
| Fathead Minnow        | 0      | 0       | 0      | 0       | 0      | 0       |
| Green Sunfish         | 0      | 0       | 6      | 7.48    | 8      | 3.83    |
| Ictalurus spp.        | 0      | 0       | 3      | 3.74    | 0      | 0       |
| Largemouth Bass       | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Loach Minnow</b>   | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Longfin Dace</b>   | 0      | 0       | 16     | 19.94   | 0      | 0       |
| <b>Roundtail Chub</b> | 4      | 2.94    | 1      | 1.25    | 3      | 1.44    |
| Smallmouth Bass       | 27     | 19.86   | 11     | 13.71   | 19     | 9.09    |
| <b>Sonora Sucker</b>  | 19     | 13.97   | 34     | 42.36   | 23     | 11.01   |
| <b>Speckled Dace</b>  | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Spikedace</b>      | 0      | 0       | 0      | 0       | 0      | 0       |
| Western Mosquitofish  | 15     | 11.03   | 7      | 8.72    | 3      | 1.44    |
| Yellow Bullhead       | 2      | 1.47    | 10     | 12.46   | 2      | 0.96    |
| Total N               | 75     |         | 101    |         | 77     |         |
| Area                  | 135.97 |         | 80.257 |         | 208.91 |         |
| Density               | 55.16  |         | 125.85 |         | 36.86  |         |

Table A3 continued. East Fork Gila River at Fall Springs site.

| Species               | 2009  |         | 2010  |         | 2011   |         |
|-----------------------|-------|---------|-------|---------|--------|---------|
|                       | N     | Density | N     | Density | N      | Density |
| Channel Catfish       | 0     | 0       | 0     | 0       | 0      | 0       |
| <b>Desert Sucker</b>  | 20    | 21.92   | 22    | 9.57    | 1      | 1.38    |
| Fathead Minnow        | 0     | 0       | 0     | 0       | 0      | 0       |
| Green Sunfish         | 1     | 1.10    | 0     | 0       | 0      | 0       |
| Ictalurus spp.        | 4     | 4.38    | 3     | 1.31    | 1      | 1.38    |
| Largemouth Bass       | 0     | 0       | 0     | 0       | 0      | 0       |
| <b>Loach Minnow</b>   | 0     | 0       | 0     | 0       | 0      | 0       |
| <b>Longfin Dace</b>   | 0     | 0       | 0     | 0       | 0      | 0       |
| <b>Roundtail Chub</b> | 0     | 0       | 5     | 2.18    | 0      | 0       |
| Smallmouth Bass       | 10    | 10.96   | 8     | 3.48    | 2      | 2.77    |
| <b>Sonora Sucker</b>  | 20    | 21.92   | 40    | 17.41   | 2      | 2.77    |
| <b>Speckled Dace</b>  | 0     | 0       | 2     | 0.87    | 0      | 0       |
| <b>Spikedace</b>      | 0     | 0       | 0     | 0       | 0      | 0       |
| Western Mosquitofish  | 5     | 5.48    | 5     | 2.18    | 63     | 87.22   |
| Yellow Bullhead       | 1     | 1.10    | 22    | 9.57    | 5      | 6.92    |
| Total N               | 61    |         | 107   |         | 74     |         |
| Area                  | 91.3  |         | 229.8 |         | 72.2   |         |
| Density               | 66.84 |         | 46.57 |         | 102.45 |         |

| Species               | 2012  |         | 2013  |         | 2014  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density |
| Channel Catfish       | 0     | 0       | 2     | 0.56    | 0     | 0       |
| <b>Desert Sucker</b>  | 0     | 0       | 1     | 0.28    | 2     | 0.41    |
| Fathead Minnow        | 0     | 0       | 0     | 0       | 0     | 0       |
| Green Sunfish         | 2     | 0.32    | 0     | 0       | 0     | 0       |
| Ictalurus spp.        | 10    | 1.61    | 15    | 4.17    | 9     | 1.86    |
| Largemouth Bass       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 1     | 0.16    | 0     | 0       | 0     | 0       |
| Smallmouth Bass       | 6     | 0.96    | 2     | 0.56    | 12    | 2.49    |
| <b>Sonora Sucker</b>  | 12    | 1.93    | 4     | 1.11    | 8     | 1.66    |
| <b>Speckled Dace</b>  | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Spikedace</b>      | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish  | 32    | 5.14    | 2     | 0.56    | 42    | 8.70    |
| Yellow Bullhead       | 16    | 2.57    | 12    | 3.34    | 8     | 1.66    |
| Total N               | 79    |         | 38    |         | 81    |         |
| Area                  | 622.4 |         | 359.4 |         | 482.6 |         |
| Density               | 12.69 |         | 10.57 |         | 16.78 |         |

Table A3 continued. East Fork Gila River at Fall Springs site.

| Species               | 2015  |         | 2016  |         | 2017  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density |
| Channel Catfish       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 7     | 1.21    | 10    | 1.94    | 9     | 1.42    |
| Fathead Minnow        | 0     | 0       | 0     | 0       | 0     | 0       |
| Green Sunfish         | 0     | 0       | 0     | 0       | 0     | 0       |
| Ictalurus spp.        | 18    | 3.12    | 15    | 2.91    | 21    | 3.32    |
| Largemouth Bass       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 0     | 0       | 0     | 0       | 0     | 0       |
| Smallmouth Bass       | 11    | 1.91    | 5     | 0.97    | 2     | 0.32    |
| <b>Sonora Sucker</b>  | 8     | 1.39    | 16    | 3.10    | 15    | 2.37    |
| <b>Speckled Dace</b>  | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Spikedace</b>      | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish  | 180   | 31.19   | 57    | 11.05   | 23    | 3.64    |
| Yellow Bullhead       | 71    | 12.30   | 15    | 2.91    | 10    | 1.58    |
| Total N               | 295   |         | 118   |         | 80    |         |
| Area                  | 577.1 |         | 515.9 |         | 631.9 |         |
| Density               | 51.12 |         | 22.87 |         | 12.66 |         |

| Species               | 2019  |         | 2020  |         | 2021  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density |
| Channel Catfish       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 9     | 3.29    | 8     | 4.74    | 3     | 0.63    |
| Fathead Minnow        | 0     | 0       | 0     | 0       | 0     | 0       |
| Green Sunfish         | 0     | 0       | 0     | 0       | 0     | 0       |
| Ictalurus spp.        | 5     | 1.83    | 3     | 1.78    | 12    | 2.53    |
| Largemouth Bass       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 0     | 0       | 0     | 0       | 0     | 0       |
| Smallmouth Bass       | 2     | 0.73    | 9     | 5.33    | 1     | 0.21    |
| <b>Sonora Sucker</b>  | 12    | 4.39    | 17    | 10.07   | 9     | 1.89    |
| <b>Speckled Dace</b>  | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Spikedace</b>      | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish  | 1     | 0.37    | 0     | 0       | 0     | 0       |
| Yellow Bullhead       | 1     | 0.37    | 0     | 0       | 19    | 4.00    |
| Total N               | 30    |         | 37    |         | 44    |         |
| Area                  | 273.3 |         | 168.8 |         | 475.0 |         |
| Density               | 10.98 |         | 21.92 |         | 9.26  |         |

Table A4. Number (N) and density (fish/100 m<sup>2</sup>) of fishes collected in the West Fork Gila River at the Gila Cliff Dwellings site, 1989 - 2021. Native species are bolded.

| Species               | 1989   |         | 1990   |         | 1991   |         |
|-----------------------|--------|---------|--------|---------|--------|---------|
|                       | N      | Density | N      | Density | N      | Density |
| Brown Trout           | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Desert Sucker</b>  | 97     | 13.86   | 7      | 0.46    | 30     | 4.53    |
| <b>Gila Trout</b>     | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Loach Minnow</b>   | 26     | 3.72    | 3      | 0.20    | 16     | 2.42    |
| <b>Longfin Dace</b>   | 127    | 18.15   | 222    | 14.59   | 42     | 6.35    |
| Rainbow Trout         | 2      | 0.29    | 15     | 0.99    | 7      | 1.06    |
| <b>Roundtail Chub</b> | 2      | 0.29    | 0      | 0       | 1      | 0.15    |
| Smallmouth Bass       | 0      | 0       | 0      | 0       | 3      | 0.45    |
| <b>Sonora Sucker</b>  | 410    | 58.60   | 105    | 6.90    | 247    | 37.32   |
| <b>Speckled Dace</b>  | 383    | 54.74   | 414    | 27.22   | 160    | 24.18   |
| <b>Spikedace</b>      | 117    | 16.72   | 46     | 3.02    | 341    | 51.53   |
| Western Mosquitofish  | 0      | 0       | 0      | 0       | 2      | 0.30    |
| Yellow Bullhead       | 0      | 0       | 1      | 0.07    | 0      | 0       |
| Total N               | 1164   |         | 813    |         | 849    |         |
| Area                  | 699.7  |         | 1521.1 |         | 661.8  |         |
| Density               | 166.36 |         | 53.45  |         | 128.29 |         |

| Species               | 1992   |         | 1993   |         | 1994  |         |
|-----------------------|--------|---------|--------|---------|-------|---------|
|                       | N      | Density | N      | Density | N     | Density |
| Brown Trout           | 6      | 0.52    | 7      | 1.25    | 2     | 0.34    |
| <b>Desert Sucker</b>  | 57     | 4.94    | 122    | 21.75   | 94    | 16.06   |
| <b>Gila Trout</b>     | 0      | 0       | 0      | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 25     | 2.16    | 19     | 3.39    | 22    | 3.76    |
| <b>Longfin Dace</b>   | 61     | 5.28    | 31     | 5.53    | 1     | 0.17    |
| Rainbow Trout         | 40     | 3.46    | 37     | 6.60    | 41    | 7.01    |
| <b>Roundtail Chub</b> | 4      | 0.35    | 9      | 1.60    | 0     | 0       |
| Smallmouth Bass       | 6      | 0.52    | 1      | 0.18    | 0     | 0       |
| <b>Sonora Sucker</b>  | 271    | 23.47   | 132    | 23.53   | 25    | 4.27    |
| <b>Speckled Dace</b>  | 311    | 26.93   | 160    | 28.52   | 139   | 23.75   |
| <b>Spikedace</b>      | 100    | 8.66    | 122    | 21.75   | 66    | 11.28   |
| Western Mosquitofish  | 4      | 0.35    | 0      | 0       | 0     | 0       |
| Yellow Bullhead       | 0      | 0       | 0      | 0       | 0     | 0       |
| Total N               | 885    |         | 640    |         | 390   |         |
| Area                  | 1154.8 |         | 560.9  |         | 585.2 |         |
| Density               | 76.63  |         | 114.09 |         | 66.64 |         |

Table A4 continued. West Fork Gila River at Gila Cliff Dwellings site.

| Species               | 1995   |         | 1996   |         | 1997  |         |
|-----------------------|--------|---------|--------|---------|-------|---------|
|                       | N      | Density | N      | Density | N     | Density |
| Brown Trout           | 0      | 0       | 2      | 0.69    | 2     | 0.61    |
| <b>Desert Sucker</b>  | 158    | 45.88   | 53     | 18.38   | 92    | 28.27   |
| <b>Gila Trout</b>     | 0      | 0       | 0      | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 7      | 2.03    | 1      | 0.35    | 5     | 1.54    |
| <b>Longfin Dace</b>   | 67     | 19.46   | 18     | 6.24    | 25    | 7.68    |
| Rainbow Trout         | 15     | 4.36    | 3      | 1.04    | 5     | 1.54    |
| <b>Roundtail Chub</b> | 3      | 0.87    | 0      | 0       | 0     | 0       |
| Smallmouth Bass       | 0      | 0       | 0      | 0       | 2     | 0.61    |
| <b>Sonora Sucker</b>  | 119    | 34.55   | 56     | 19.42   | 76    | 23.36   |
| <b>Speckled Dace</b>  | 264    | 76.66   | 12     | 4.16    | 71    | 21.82   |
| <b>Spikedace</b>      | 53     | 15.39   | 2      | 0.69    | 19    | 5.84    |
| Western Mosquitofish  | 0      | 0       | 0      | 0       | 0     | 0       |
| Yellow Bullhead       | 0      | 0       | 1      | 0.35    | 1     | 0.31    |
| Total N               | 686    |         | 148    |         | 298   |         |
| Area                  | 344.38 |         | 288.38 |         | 325.4 |         |
| Density               | 199.20 |         | 51.32  |         | 91.58 |         |

| Species               | 1998   |         | 1999  |         | 2000  |         |
|-----------------------|--------|---------|-------|---------|-------|---------|
|                       | N      | Density | N     | Density | N     | Density |
| Brown Trout           | 2      | 0.70    | 3     | 0.72    | 1     | 0.50    |
| <b>Desert Sucker</b>  | 73     | 25.58   | 18    | 4.30    | 0     | 0       |
| <b>Gila Trout</b>     | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 8      | 2.80    | 1     | 0.24    | 0     | 0       |
| <b>Longfin Dace</b>   | 23     | 8.06    | 14    | 3.34    | 18    | 8.98    |
| Rainbow Trout         | 1      | 0.35    | 2     | 0.48    | 0     | 0       |
| <b>Roundtail Chub</b> | 0      | 0       | 1     | 0.24    | 0     | 0       |
| Smallmouth Bass       | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b>  | 115    | 40.30   | 23    | 5.49    | 12    | 5.99    |
| <b>Speckled Dace</b>  | 214    | 74.99   | 38    | 9.07    | 53    | 26.44   |
| <b>Spikedace</b>      | 12     | 4.20    | 12    | 2.87    | 8     | 3.99    |
| Western Mosquitofish  | 0      | 0       | 0     | 0       | 4     | 2.00    |
| Yellow Bullhead       | 0      | 0       | 0     | 0       | 0     | 0       |
| Total N               | 448    |         | 112   |         | 96    |         |
| Area                  | 285.4  |         | 418.7 |         | 200.5 |         |
| Density               | 156.98 |         | 26.75 |         | 47.89 |         |

Table A4 continued. West Fork Gila River at Gila Cliff Dwellings site.

| Species               | 2001  |         | 2002  |         | 2003  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density |
| Brown Trout           | 1     | 0.26    | 3     | 0.82    | 0     | 0       |
| <b>Desert Sucker</b>  | 27    | 7.01    | 39    | 10.63   | 14    | 5.14    |
| <b>Gila Trout</b>     | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 1     | 0.26    | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 46    | 11.95   | 2     | 0.55    | 0     | 0       |
| Rainbow Trout         | 1     | 0.26    | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 1     | 0.26    | 0     | 0       | 6     | 2.20    |
| Smallmouth Bass       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b>  | 12    | 3.12    | 16    | 4.36    | 7     | 2.57    |
| <b>Speckled Dace</b>  | 78    | 20.26   | 1     | 0.27    | 2     | 0.73    |
| <b>Spikedace</b>      | 12    | 3.12    | 5     | 1.36    | 1     | 0.37    |
| Western Mosquitofish  | 0     | 0       | 0     | 0       | 0     | 0       |
| Yellow Bullhead       | 0     | 0       | 0     | 0       | 0     | 0       |
| Total N               | 179   |         | 66    |         | 30    |         |
| Area                  | 385.0 |         | 366.8 |         | 272.2 |         |
| Density               | 46.50 |         | 17.99 |         | 11.02 |         |

| Species               | 2004  |         | 2005  |         | 2006  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density |
| Brown Trout           | 0     | 0       | 1     | 0.24    | 3     | 1.66    |
| <b>Desert Sucker</b>  | 26    | 7.57    | 110   | 26.80   | 15    | 8.30    |
| <b>Gila Trout</b>     | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 3     | 0.87    | 13    | 3.17    | 0     | 0       |
| Rainbow Trout         | 1     | 0.29    | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 3     | 0.87    | 22    | 5.36    | 6     | 3.32    |
| Smallmouth Bass       | 1     | 0.29    | 2     | 0.49    | 0     | 0       |
| <b>Sonora Sucker</b>  | 28    | 8.16    | 106   | 25.83   | 21    | 11.63   |
| <b>Speckled Dace</b>  | 8     | 2.33    | 26    | 6.33    | 14    | 7.75    |
| <b>Spikedace</b>      | 0     | 0       | 1     | 0.24    | 0     | 0       |
| Western Mosquitofish  | 0     | 0       | 0     | 0       | 0     | 0       |
| Yellow Bullhead       | 0     | 0       | 0     | 0       | 0     | 0       |
| Total N               | 70    |         | 281   |         | 59    |         |
| Area                  | 343.3 |         | 410.5 |         | 180.6 |         |
| Density               | 20.39 |         | 68.46 |         | 32.66 |         |

Table A4 continued. West Fork Gila River at Gila Cliff Dwellings site.

| Species               | 2007  |         | 2008  |         | 2009  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density |
| Brown Trout           | 14    | 7.14    | 3     | 0.74    | 3     | 2.03    |
| <b>Desert Sucker</b>  | 22    | 11.22   | 6     | 1.49    | 1     | 0.68    |
| <b>Gila Trout</b>     | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 12    | 6.12    | 29    | 7.18    | 4     | 2.71    |
| Rainbow Trout         | 4     | 2.04    | 4     | 0.99    | 2     | 1.35    |
| <b>Roundtail Chub</b> | 0     | 0       | 1     | 0.25    | 0     | 0       |
| Smallmouth Bass       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b>  | 22    | 11.22   | 60    | 14.86   | 39    | 26.40   |
| <b>Speckled Dace</b>  | 17    | 8.67    | 171   | 42.35   | 61    | 41.29   |
| <b>Spikedace</b>      | 1     | 0.51    | 15    | 3.71    | 13    | 8.80    |
| Western Mosquitofish  | 0     | 0       | 0     | 0       | 0     | 0       |
| Yellow Bullhead       | 0     | 0       | 0     | 0       | 0     | 0       |
| Total N               | 92    |         | 289   |         | 123   |         |
| Area                  | 196.1 |         | 403.8 |         | 147.8 |         |
| Density               | 46.91 |         | 71.57 |         | 83.25 |         |

| Species               | 2010   |         | 2011  |         | 2012  |         |
|-----------------------|--------|---------|-------|---------|-------|---------|
|                       | N      | Density | N     | Density | N     | Density |
| Brown Trout           | 2      | 0.82    | 2     | 0.56    | 0     | 0       |
| <b>Desert Sucker</b>  | 34     | 14.00   | 7     | 1.96    | 2     | 0.59    |
| <b>Gila Trout</b>     | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 5      | 2.06    | 12    | 3.35    | 36    | 10.64   |
| Rainbow Trout         | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 1      | 0.41    | 0     | 0       | 0     | 0       |
| Smallmouth Bass       | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b>  | 30     | 12.35   | 15    | 4.19    | 9     | 2.66    |
| <b>Speckled Dace</b>  | 170    | 70.01   | 69    | 19.28   | 79    | 23.34   |
| <b>Spikedace</b>      | 23     | 9.47    | 16    | 4.47    | 8     | 2.36    |
| Western Mosquitofish  | 0      | 0       | 0     | 0       | 0     | 0       |
| Yellow Bullhead       | 0      | 0       | 0     | 0       | 2     | 0.59    |
| Total N               | 265    |         | 121   |         | 136   |         |
| Area                  | 242.8  |         | 357.9 |         | 338.4 |         |
| Density               | 109.13 |         | 33.81 |         | 40.19 |         |



Table A4 continued. West Fork Gila River at Gila Cliff Dwellings site.

| Species               | 2013  |         | 2014  |         | 2015  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density |
| Brown Trout           | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 0     | 0       | 17    | 4.83    | 22    | 5.14    |
| <b>Gila Trout</b>     | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 0     | 0       | 3     | 0.85    | 6     | 1.40    |
| <b>Longfin Dace</b>   | 0     | 0       | 20    | 5.69    | 45    | 10.52   |
| Rainbow Trout         | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 0     | 0       | 0     | 0       | 0     | 0       |
| Smallmouth Bass       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b>  | 0     | 0       | 23    | 6.54    | 18    | 4.21    |
| <b>Speckled Dace</b>  | 25    | 12.28   | 113   | 32.12   | 105   | 24.54   |
| <b>Spikedace</b>      | 0     | 0       | 1     | 0.28    | 38    | 8.88    |
| Western Mosquitofish  | 0     | 0       | 0     | 0       | 0     | 0       |
| Yellow Bullhead       | 0     | 0       | 0     | 0       | 0     | 0       |
| Total N               | 25    |         | 177   |         | 234   |         |
| Area                  | 203.7 |         | 351.8 |         | 428.0 |         |
| Density               | 12.28 |         | 50.31 |         | 54.68 |         |

| Species               | 2016  |         | 2017  |         | 2018  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density |
| Brown Trout           | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 107   | 23.61   | 143   | 21.73   | 7     | 5.75    |
| <b>Gila Trout</b>     | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 16    | 3.53    | 30    | 4.56    | 2     | 1.64    |
| <b>Longfin Dace</b>   | 40    | 8.83    | 9     | 1.37    | 1     | 0.82    |
| Rainbow Trout         | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 0     | 0       | 1     | 0.15    | 0     | 0       |
| Smallmouth Bass       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b>  | 73    | 16.11   | 28    | 4.26    | 6     | 4.93    |
| <b>Speckled Dace</b>  | 114   | 25.15   | 102   | 15.50   | 11    | 9.04    |
| <b>Spikedace</b>      | 81    | 17.87   | 11    | 1.67    | 5     | 4.11    |
| Western Mosquitofish  | 0     | 0       | 0     | 0       | 0     | 0       |
| Yellow Bullhead       | 0     | 0       | 0     | 0       | 0     | 0       |
| Total N               | 431   |         | 324   |         | 32    |         |
| Area                  | 453.2 |         | 658.0 |         | 121.7 |         |
| Density               | 95.09 |         | 49.24 |         | 26.30 |         |

Table A4 continued. West Fork Gila River at Gila Cliff Dwellings site.

| Species               | 2019   |         | 2020  |         | 2021  |         |
|-----------------------|--------|---------|-------|---------|-------|---------|
|                       | N      | Density | N     | Density | N     | Density |
| Brown Trout           | 0      | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 62     | 36.25   | 93    | 29.50   | 7     | 2.43    |
| <b>Gila Trout</b>     | 1      | 0.58    | 6     | 1.90    | 0     | 0       |
| <b>Loach Minnow</b>   | 6      | 3.51    | 4     | 1.27    | 0     | 0       |
| <b>Longfin Dace</b>   | 7      | 4.09    | 2     | 0.63    | 1     | 0.35    |
| Rainbow Trout         | 0      | 0       | 1     | 0.32    | 0     | 0       |
| <b>Roundtail Chub</b> | 0      | 0       | 0     | 0       | 0     | 0       |
| Smallmouth Bass       | 1      | 0.58    | 1     | 0.32    | 0     | 0       |
| <b>Sonora Sucker</b>  | 42     | 24.55   | 34    | 10.79   | 27    | 9.37    |
| <b>Speckled Dace</b>  | 80     | 46.77   | 112   | 35.53   | 32    | 11.11   |
| <b>Spikedace</b>      | 16     | 9.35    | 10    | 3.17    | 4     | 1.39    |
| Western Mosquitofish  | 0      | 0       | 0     | 0       | 0     | 0       |
| Yellow Bullhead       | 0      | 0       | 0     | 0       | 0     | 0       |
| Total N               | 215    |         | 263   |         | 71    |         |
| Area                  | 171.1  |         | 315.2 |         | 288.0 |         |
| Density               | 125.69 |         | 83.43 |         | 24.65 |         |

Table A5. Number (N) and density (fish/100 m<sup>2</sup>) of fishes collected in the Middle Fork Gila River at the Trailhead site, 1988 - 2021. Native species are bolded.

| Species               | 1988   |         | 1989   |         | 1990   |         | 1991   |         | 1992   |         |
|-----------------------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
|                       | N      | Density | N      | Density | N      | Density | N      | Density | N      | Density |
| Black Bullhead        | 2      | 0.12    | 0      | 0       | 0      | 0       | 0      | 0       | 0      | 0       |
| Bluegill              | 0      | 0       | 0      | 0       | 0      | 0       | 0      | 0       | 1      | 0.05    |
| Brown Trout           | 1      | 0.06    | 1      | 0.10    | 0      | 0       | 0      | 0       | 0      | 0       |
| Common Carp           | 0      | 0       | 0      | 0       | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Desert Sucker</b>  | 11     | 0.68    | 37     | 3.66    | 11     | 0.73    | 26     | 1.55    | 93     | 4.89    |
| Fathead Minnow        | 2      | 0.12    | 0      | 0       | 0      | 0       | 2      | 0.12    | 0      | 0       |
| Flathead Catfish      | 0      | 0       | 0      | 0       | 0      | 0       | 0      | 0       | 0      | 0       |
| Green Sunfish         | 0      | 0       | 0      | 0       | 0      | 0       | 0      | 0       | 1      | 0.05    |
| <b>Loach Minnow</b>   | 22     | 1.37    | 69     | 6.83    | 5      | 0.33    | 24     | 1.43    | 68     | 3.57    |
| <b>Longfin Dace</b>   | 31     | 1.93    | 83     | 8.22    | 4      | 0.27    | 61     | 3.63    | 132    | 6.94    |
| Rainbow Trout         | 0      | 0       | 5      | 0.50    | 0      | 0       | 0      | 0       | 0      | 0       |
| Red Shiner            | 0      | 0       | 0      | 0       | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Roundtail Chub</b> | 1      | 0.06    | 12     | 1.19    | 2      | 0.13    | 11     | 0.65    | 83     | 4.36    |
| Smallmouth Bass       | 3      | 0.19    | 9      | 0.89    | 4      | 0.27    | 9      | 0.54    | 21     | 1.10    |
| <b>Sonora Sucker</b>  | 48     | 2.99    | 52     | 5.15    | 15     | 1.00    | 43     | 2.56    | 221    | 11.61   |
| <b>Speckled Dace</b>  | 25     | 1.56    | 84     | 8.32    | 7      | 0.47    | 20     | 1.19    | 68     | 3.57    |
| <b>Spikedace</b>      | 22     | 1.37    | 24     | 2.38    | 1      | 0.07    | 0      | 0       | 10     | 0.53    |
| THARUF                | 0      | 0       | 0      | 0       | 1      | 0.07    | 0      | 0       | 0      | 0       |
| Western Mosquitofish  | 0      | 0       | 66     | 6.54    | 98     | 6.52    | 31     | 1.84    | 4      | 0.21    |
| Yellow Bullhead       | 3      | 0.19    | 26     | 2.57    | 35     | 2.33    | 8      | 0.48    | 56     | 2.94    |
| Total N               | 171    |         | 468    |         | 183    |         | 235    |         | 758    |         |
| Area                  | 1607.7 |         | 1009.9 |         | 1503.7 |         | 1680.4 |         | 1903.3 |         |
| Density               | 10.64  |         | 46.34  |         | 12.17  |         | 13.98  |         | 39.82  |         |

Table A5 continued. Middle Fork Gila River at the Trailhead site.

| Species               | 1993  |         | 1994  |         | 1995  |         | 1996  |         | 1997  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density | N     | Density | N     | Density |
| Black Bullhead        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Bluegill              | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Brown Trout           | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Common Carp           | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 79    | 12.22   | 9     | 1.11    | 22    | 2.82    | 3     | 0.60    | 3     | 1.96    |
| Fathead Minnow        | 1     | 0.15    | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Flathead Catfish      | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Green Sunfish         | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 1     | 0.65    |
| <b>Loach Minnow</b>   | 45    | 6.96    | 3     | 0.37    | 11    | 1.41    | 1     | 0.20    | 1     | 0.65    |
| <b>Longfin Dace</b>   | 36    | 5.57    | 5     | 0.62    | 12    | 1.54    | 0     | 0       | 1     | 0.65    |
| Rainbow Trout         | 9     | 1.39    | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Red Shiner            | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 14    | 2.16    | 6     | 0.74    | 10    | 1.28    | 7     | 1.40    | 5     | 3.27    |
| Smallmouth Bass       | 9     | 1.39    | 9     | 1.11    | 18    | 2.30    | 9     | 1.80    | 16    | 10.46   |
| <b>Sonora Sucker</b>  | 124   | 19.17   | 26    | 3.21    | 23    | 2.94    | 41    | 8.19    | 27    | 17.65   |
| <b>Speckled Dace</b>  | 49    | 7.58    | 5     | 0.62    | 16    | 2.05    | 0     | 0       | 0     | 0       |
| <b>Spikedace</b>      | 15    | 2.32    | 0     | 0       | 1     | 0.13    | 0     | 0       | 0     | 0       |
| THARUF                | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish  | 0     | 0       | 2     | 0.25    | 0     | 0       | 50    | 9.99    | 0     | 0       |
| Yellow Bullhead       | 14    | 2.16    | 54    | 6.67    | 46    | 5.89    | 61    | 12.19   | 56    | 36.61   |
| Total N               | 395   |         | 119   |         | 159   |         | 172   |         | 110   |         |
| Area                  | 646.7 |         | 809.1 |         | 781.4 |         | 500.6 |         | 153.0 |         |
| Density               | 61.08 |         | 14.71 |         | 20.35 |         | 34.36 |         | 71.91 |         |

Table A5 continued. Middle Fork Gila River at the Trailhead site.

| Species               | 1998  |         | 1999  |         | 2000  |         | 2001  |         | 2002  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density | N     | Density | N     | Density |
| Black Bullhead        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Bluegill              | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Brown Trout           | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Common Carp           | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 12    | 7.42    | 1     | 0.22    | 0     | 0       | 0     | 0       | 2     | 0.57    |
| Fathead Minnow        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Flathead Catfish      | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Green Sunfish         | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 3     | 1.86    | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Rainbow Trout         | 1     | 0.62    | 1     | 0.22    | 1     | 0.83    | 0     | 0       | 0     | 0       |
| Red Shiner            | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 7     | 4.33    | 5     | 1.08    | 0     | 0       | 1     | 0.45    | 2     | 0.57    |
| Smallmouth Bass       | 23    | 14.23   | 17    | 3.66    | 2     | 1.66    | 7     | 3.16    | 16    | 4.58    |
| <b>Sonora Sucker</b>  | 51    | 31.55   | 22    | 4.73    | 1     | 0.83    | 12    | 5.43    | 8     | 2.29    |
| <b>Speckled Dace</b>  | 1     | 0.62    | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Spikedace</b>      | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| THARUF                | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish  | 1     | 0.62    | 71    | 15.28   | 1     | 0.83    | 2     | 0.90    | 3     | 0.86    |
| Yellow Bullhead       | 44    | 27.22   | 29    | 6.24    | 6     | 4.97    | 24    | 10.85   | 17    | 4.87    |
| Total N               | 143   |         | 146   |         | 11    |         | 46    |         | 48    |         |
| Area                  | 161.6 |         | 464.7 |         | 120.8 |         | 221.2 |         | 349.2 |         |
| Density               | 88.48 |         | 31.42 |         | 9.11  |         | 20.80 |         | 13.75 |         |

Table A5 continued. Middle Fork Gila River at the Trailhead site.

| Species               | 2003  |         | 2004  |         | 2005  |         | 2006  |         | 2007  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density | N     | Density | N     | Density |
| Black Bullhead        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Bluegill              | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Brown Trout           | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 2     | 1.63    |
| Common Carp           | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 1     | 0.57    | 0     | 0       | 3     | 0.49    | 0     | 0       | 6     | 4.90    |
| Fathead Minnow        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Flathead Catfish      | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Green Sunfish         | 0     | 0       | 1     | 0.38    | 0     | 0       | 0     | 0       | 1     | 0.82    |
| <b>Loach Minnow</b>   | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 13    | 10.61   |
| Rainbow Trout         | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Red Shiner            | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 2     | 1.63    |
| Smallmouth Bass       | 8     | 4.55    | 39    | 14.73   | 23    | 3.73    | 11    | 15.12   | 2     | 1.63    |
| <b>Sonora Sucker</b>  | 7     | 3.98    | 19    | 7.18    | 11    | 1.79    | 1     | 1.37    | 20    | 16.32   |
| <b>Speckled Dace</b>  | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Spikedace</b>      | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| THARUF                | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish  | 1     | 0.57    | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Yellow Bullhead       | 9     | 5.12    | 10    | 3.78    | 7     | 1.14    | 5     | 6.87    | 5     | 4.08    |
| Total N               | 26    |         | 69    |         | 44    |         | 17    |         | 51    |         |
| Area                  | 175.9 |         | 264.8 |         | 615.8 |         | 72.8  |         | 122.5 |         |
| Density               | 14.79 |         | 26.06 |         | 7.14  |         | 23.36 |         | 41.62 |         |

Table A5 continued. Middle Fork Gila River at the Trailhead site.

| Species               | 2008  |         | 2009  |         | 2010  |         | 2011  |         | 2012  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density | N     | Density | N     | Density |
| Black Bullhead        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Bluegill              | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Brown Trout           | 1     | 0.28    | 5     | 2.19    | 1     | 0.32    | 0     | 0       | 0     | 0       |
| Common Carp           | 0     | 0       | 0     | 0       | 0     | 0       | 1     | 0.40    | 0     | 0       |
| <b>Desert Sucker</b>  | 43    | 12.10   | 2     | 0.88    | 5     | 1.62    | 0     | 0       | 1     | 0.68    |
| Fathead Minnow        | 0     | 0       | 0     | 0       | 0     | 0       | 5     | 2.00    | 0     | 0       |
| Flathead Catfish      | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 1     | 0.68    |
| Green Sunfish         | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 34    | 9.56    | 17    | 7.45    | 0     | 0       | 0     | 0       | 0     | 0       |
| Rainbow Trout         | 2     | 0.56    | 2     | 0.88    | 0     | 0       | 0     | 0       | 0     | 0       |
| Red Shiner            | 0     | 0       | 9     | 3.94    | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 34    | 9.56    | 16    | 7.01    | 0     | 0       | 7     | 2.80    | 0     | 0       |
| Smallmouth Bass       | 7     | 1.97    | 3     | 1.31    | 9     | 2.91    | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b>  | 93    | 26.16   | 67    | 29.36   | 21    | 6.80    | 21    | 8.40    | 6     | 4.07    |
| <b>Speckled Dace</b>  | 3     | 0.84    | 0     | 0       | 5     | 1.62    | 1     | 0.40    | 0     | 0       |
| <b>Spikedace</b>      | 1     | 0.28    | 0     | 0       | 2     | 0.65    | 0     | 0       | 0     | 0       |
| THARUF                | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish  | 0     | 0       | 2     | 0.88    | 1     | 0.32    | 77    | 30.79   | 0     | 0       |
| Yellow Bullhead       | 13    | 3.66    | 8     | 3.51    | 5     | 1.62    | 10    | 4.00    | 0     | 0       |
| Total N               | 231   |         | 131   |         | 49    |         | 122   |         | 8     |         |
| Area                  | 355.5 |         | 228.2 |         | 309.1 |         | 250.1 |         | 147.5 |         |
| Density               | 64.98 |         | 57.41 |         | 15.86 |         | 48.79 |         | 5.42  |         |

Table A5 continued. Middle Fork Gila River at the Trailhead site.

| Species               | 2013  |         | 2014  |         | 2015  |         | 2016  |         | 2017   |         |
|-----------------------|-------|---------|-------|---------|-------|---------|-------|---------|--------|---------|
|                       | N     | Density | N     | Density | N     | Density | N     | Density | N      | Density |
| Black Bullhead        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0      | 0       |
| Bluegill              | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0      | 0       |
| Brown Trout           | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0      | 0       |
| Common Carp           | 0     | 0       | 2     | 0.23    | 0     | 0       | 1     | 0.20    | 0      | 0       |
| <b>Desert Sucker</b>  | 2     | 0.94    | 21    | 2.39    | 11    | 2.19    | 23    | 4.62    | 127    | 7.97    |
| Fathead Minnow        | 0     | 0       | 0     | 0       | 2     | 0.40    | 0     | 0       | 0      | 0       |
| Flathead Catfish      | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0      | 0       |
| Green Sunfish         | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0      | 0       |
| <b>Loach Minnow</b>   | 2     | 0.94    | 16    | 1.82    | 5     | 1.00    | 31    | 6.22    | 76     | 4.77    |
| <b>Longfin Dace</b>   | 2     | 0.94    | 27    | 3.07    | 3     | 0.60    | 6     | 1.20    | 11     | 0.69    |
| Rainbow Trout         | 0     | 0       | 0     | 0       | 1     | 0.20    | 0     | 0       | 0      | 0       |
| Red Shiner            | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0      | 0       |
| <b>Roundtail Chub</b> | 6     | 2.81    | 0     | 0       | 0     | 0       | 0     | 0       | 5      | 0.31    |
| Smallmouth Bass       | 0     | 0       | 0     | 0       | 0     | 0       | 1     | 0.20    | 0      | 0       |
| <b>Sonora Sucker</b>  | 12    | 5.62    | 62    | 7.04    | 43    | 8.58    | 5     | 1.00    | 33     | 2.07    |
| <b>Speckled Dace</b>  | 10    | 4.68    | 5     | 0.57    | 2     | 0.40    | 4     | 0.80    | 9      | 0.56    |
| <b>Spikedace</b>      | 0     | 0       | 5     | 0.57    | 10    | 2.00    | 3     | 0.60    | 1      | 0.06    |
| THARUF                | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       | 0      | 0       |
| Western Mosquitofish  | 0     | 0       | 2     | 0.23    | 48    | 9.58    | 3     | 0.60    | 0      | 0       |
| Yellow Bullhead       | 0     | 0       | 56    | 6.36    | 1     | 0.20    | 0     | 0       | 12     | 0.75    |
| Total N               | 34    |         | 196   |         | 126   |         | 77    |         | 274    |         |
| Area                  | 213.5 |         | 880.4 |         | 501.2 |         | 498.0 |         | 1593.0 |         |
| Density               | 15.93 |         | 22.26 |         | 25.14 |         | 15.46 |         | 17.20  |         |



Table A5 continued. Middle Fork Gila River at the Trailhead site.

| Species               | 2018  |         | 2019  |         | 2020  |         | 2021  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density | N     | Density |
| Black Bullhead        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Bluegill              | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Brown Trout           | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Common Carp           | 0     | 0       | 1     | 0.53    | 0     | 0       | 2     | 0.90    |
| <b>Desert Sucker</b>  | 5     | 6.81    | 11    | 5.80    | 4     | 1.23    | 0     | 0       |
| Fathead Minnow        | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Flathead Catfish      | 0     | 0       | 0     | 0       | 0     | 0       | 1     | 0.45    |
| Green Sunfish         | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 4     | 5.45    | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Longfin Dace</b>   | 1     | 1.36    | 0     | 0       | 1     | 0.31    | 0     | 0       |
| Rainbow Trout         | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Red Shiner            | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Roundtail Chub</b> | 0     | 0       | 1     | 0.53    | 0     | 0       | 0     | 0       |
| Smallmouth Bass       | 0     | 0       | 2     | 1.06    | 17    | 5.21    | 1     | 0.45    |
| <b>Sonora Sucker</b>  | 13    | 17.72   | 17    | 8.97    | 15    | 4.60    | 1     | 0.45    |
| <b>Speckled Dace</b>  | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Spikedace</b>      | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| THARUF                | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish  | 0     | 0       | 0     | 0       | 0     | 0       | 4     | 1.80    |
| Yellow Bullhead       | 6     | 8.18    | 15    | 7.92    | 16    | 4.91    | 8     | 3.60    |
| Total N               | 29    |         | 47    |         | 53    |         | 17    |         |
| Area                  | 73.4  |         | 189.5 |         | 326.2 |         | 222.5 |         |
| Density               | 39.53 |         | 24.80 |         | 16.25 |         | 7.64  |         |

Table A6. Number (N) and density (fish/100 m<sup>2</sup>) of fishes collected in the Gila River at the Riverside Iron Bridge site, 1988 - 2021. Native species are bolded.

| Species               | 1988   |         | 1989   |         | 1990   |         |
|-----------------------|--------|---------|--------|---------|--------|---------|
|                       | N      | Density | N      | Density | N      | Density |
| Channel Catfish       | 0      | 0       | 2      | 0.10    | 0      | 0       |
| Common Carp           | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Desert Sucker</b>  | 93     | 4.10    | 90     | 4.42    | 55     | 1.47    |
| Fathead Minnow        | 0      | 0       | 0      | 0       | 0      | 0       |
| Flathead Catfish      | 0      | 0       | 1      | 0.05    | 0      | 0       |
| Green Sunfish         | 0      | 0       | 1      | 0.05    | 0      | 0       |
| Largemouth Bass       | 0      | 0       | 0      | 0       | 1      | 0.03    |
| <b>Loach Minnow</b>   | 69     | 3.05    | 185    | 9.09    | 48     | 1.28    |
| <b>Longfin Dace</b>   | 77     | 3.40    | 313    | 15.37   | 428    | 11.40   |
| Red Shiner            | 0      | 0       | 0      | 0       | 1      | 0.03    |
| <b>Roundtail Chub</b> | 0      | 0       | 0      | 0       | 0      | 0       |
| Smallmouth Bass       | 0      | 0       | 3      | 0.15    | 0      | 0       |
| <b>Sonora Sucker</b>  | 87     | 3.84    | 61     | 3.00    | 97     | 2.58    |
| <b>Spikedace</b>      | 74     | 3.27    | 58     | 2.85    | 44     | 1.17    |
| Western Mosquitofish  | 10     | 0.44    | 54     | 2.65    | 9      | 0.24    |
| Yellow Bullhead       | 0      | 0       | 0      | 0       | 0      | 0       |
| Total N               | 410    |         | 768    |         | 683    |         |
| Area                  | 2265.7 |         | 2036.2 |         | 3753.4 |         |
| Density               | 18.10  |         | 37.72  |         | 18.20  |         |

| Species               | 1991   |         | 1992   |         | 1993  |         |
|-----------------------|--------|---------|--------|---------|-------|---------|
|                       | N      | Density | N      | Density | N     | Density |
| Channel Catfish       | 0      | 0       | 0      | 0       | 0     | 0       |
| Common Carp           | 18     | 0.92    | 0      | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 121    | 6.16    | 23     | 0.94    | 36    | 5.12    |
| Fathead Minnow        | 0      | 0       | 0      | 0       | 0     | 0       |
| Flathead Catfish      | 0      | 0       | 1      | 0.04    | 0     | 0       |
| Green Sunfish         | 6      | 0.31    | 0      | 0       | 0     | 0       |
| Largemouth Bass       | 40     | 2.04    | 0      | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 153    | 7.78    | 99     | 4.07    | 25    | 3.56    |
| <b>Longfin Dace</b>   | 35     | 1.78    | 24     | 0.99    | 36    | 5.12    |
| Red Shiner            | 0      | 0       | 0      | 0       | 7     | 1.00    |
| <b>Roundtail Chub</b> | 1      | 0.05    | 0      | 0       | 0     | 0       |
| Smallmouth Bass       | 3      | 0.15    | 10     | 0.41    | 0     | 0       |
| <b>Sonora Sucker</b>  | 38     | 1.93    | 8      | 0.33    | 36    | 5.12    |
| <b>Spikedace</b>      | 207    | 10.53   | 298    | 12.24   | 62    | 8.82    |
| Western Mosquitofish  | 18     | 0.92    | 9      | 0.37    | 4     | 0.57    |
| Yellow Bullhead       | 7      | 0.36    | 1      | 0.04    | 0     | 0       |
| Total N               | 647    |         | 473    |         | 206   |         |
| Area                  | 1965.5 |         | 2433.9 |         | 702.9 |         |
| Density               | 32.92  |         | 19.43  |         | 29.31 |         |

Table A6 continued. Gila River at Riverside Iron Bridge site.

| Species               | 1994  |         | 1995   |         | 1996  |         |
|-----------------------|-------|---------|--------|---------|-------|---------|
|                       | N     | Density | N      | Density | N     | Density |
| Channel Catfish       | 0     | 0       | 0      | 0       | 0     | 0       |
| Common Carp           | 1     | 0.19    | 0      | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 39    | 7.56    | 129    | 41.96   | 7     | 1.67    |
| Fathead Minnow        | 0     | 0       | 0      | 0       | 0     | 0       |
| Flathead Catfish      | 0     | 0       | 0      | 0       | 0     | 0       |
| Green Sunfish         | 0     | 0       | 0      | 0       | 0     | 0       |
| Largemouth Bass       | 0     | 0       | 0      | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 25    | 4.85    | 10     | 3.25    | 0     | 0       |
| <b>Longfin Dace</b>   | 1     | 0.19    | 66     | 21.47   | 93    | 22.17   |
| Red Shiner            | 0     | 0       | 1      | 0.33    | 3     | 0.72    |
| <b>Roundtail Chub</b> | 0     | 0       | 0      | 0       | 0     | 0       |
| Smallmouth Bass       | 0     | 0       | 0      | 0       | 0     | 0       |
| <b>Sonora Sucker</b>  | 7     | 1.36    | 611    | 198.76  | 25    | 5.96    |
| <b>Spikedace</b>      | 4     | 0.78    | 60     | 19.52   | 10    | 2.38    |
| Western Mosquitofish  | 162   | 31.42   | 22     | 7.16    | 7     | 1.67    |
| Yellow Bullhead       | 0     | 0       | 5      | 1.63    | 1     | 0.24    |
| Total N               | 239   |         | 904    |         | 146   |         |
| Area                  | 515.6 |         | 307.4  |         | 419.5 |         |
| Density               | 46.35 |         | 294.07 |         | 34.81 |         |

| Species               | 1997  |         | 1998   |         | 1999  |         |
|-----------------------|-------|---------|--------|---------|-------|---------|
|                       | N     | Density | N      | Density | N     | Density |
| Channel Catfish       | 0     | 0       | 0      | 0       | 0     | 0       |
| Common Carp           | 0     | 0       | 0      | 0       | 0     | 0       |
| <b>Desert Sucker</b>  | 31    | 13.09   | 92     | 32.50   | 6     | 1.28    |
| Fathead Minnow        | 0     | 0       | 33     | 11.66   | 0     | 0       |
| Flathead Catfish      | 0     | 0       | 1      | 0.35    | 0     | 0       |
| Green Sunfish         | 0     | 0       | 0      | 0       | 0     | 0       |
| Largemouth Bass       | 0     | 0       | 0      | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 7     | 2.96    | 20     | 7.06    | 8     | 1.71    |
| <b>Longfin Dace</b>   | 0     | 0       | 34     | 12.01   | 129   | 27.61   |
| Red Shiner            | 0     | 0       | 148    | 52.28   | 5     | 1.07    |
| <b>Roundtail Chub</b> | 0     | 0       | 0      | 0       | 0     | 0       |
| Smallmouth Bass       | 0     | 0       | 0      | 0       | 0     | 0       |
| <b>Sonora Sucker</b>  | 50    | 21.11   | 109    | 38.50   | 14    | 3.00    |
| <b>Spikedace</b>      | 25    | 10.56   | 45     | 15.89   | 1     | 0.21    |
| Western Mosquitofish  | 0     | 0       | 277    | 97.84   | 226   | 48.38   |
| Yellow Bullhead       | 1     | 0.42    | 2      | 0.71    | 0     | 0       |
| Total N               | 114   |         | 761    |         | 389   |         |
| Area                  | 236.8 |         | 283.1  |         | 467.2 |         |
| Density               | 48.14 |         | 268.80 |         | 83.27 |         |

Table A6 continued. Gila River at Riverside Iron Bridge site.

| Species               | 2000 |         | 2001  |         | 2002  |         |
|-----------------------|------|---------|-------|---------|-------|---------|
|                       | N    | Density | N     | Density | N     | Density |
| Channel Catfish       |      |         | 0     | 0       | 0     | 0       |
| Common Carp           |      |         | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b>  |      |         | 28    | 8.00    | 8     | 1.53    |
| Fathead Minnow        |      |         | 0     | 0       | 0     | 0       |
| Flathead Catfish      |      |         | 0     | 0       | 0     | 0       |
| Green Sunfish         |      |         | 0     | 0       | 0     | 0       |
| Largemouth Bass       |      |         | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   |      |         | 26    | 7.43    | 10    | 1.91    |
| <b>Longfin Dace</b>   |      |         | 19    | 5.43    | 19    | 3.63    |
| Red Shiner            |      |         | 0     | 0       | 7     | 1.34    |
| <b>Roundtail Chub</b> |      |         | 0     | 0       | 0     | 0       |
| Smallmouth Bass       |      |         | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b>  |      |         | 9     | 2.57    | 4     | 0.76    |
| <b>Spikedace</b>      |      |         | 22    | 6.28    | 0     | 0       |
| Western Mosquitofish  |      |         | 11    | 3.14    | 1     | 0.19    |
| Yellow Bullhead       |      |         | 0     | 0       | 0     | 0       |
| Total N               |      |         | 115   |         | 49    |         |
| Area                  |      |         | 350.1 |         | 522.9 |         |
| Density               |      |         | 32.85 |         | 9.37  |         |

| Species               | 2003  |         | 2004  |         | 2005   |         |
|-----------------------|-------|---------|-------|---------|--------|---------|
|                       | N     | Density | N     | Density | N      | Density |
| Channel Catfish       | 0     | 0       | 0     | 0       | 0      | 0       |
| Common Carp           | 0     | 0       | 0     | 0       | 0      | 0       |
| <b>Desert Sucker</b>  | 5     | 1.72    | 44    | 8.25    | 137    | 26.32   |
| Fathead Minnow        | 0     | 0       | 0     | 0       | 0      | 0       |
| Flathead Catfish      | 0     | 0       | 0     | 0       | 0      | 0       |
| Green Sunfish         | 0     | 0       | 0     | 0       | 0      | 0       |
| Largemouth Bass       | 0     | 0       | 0     | 0       | 0      | 0       |
| <b>Loach Minnow</b>   | 55    | 18.93   | 137   | 25.69   | 73     | 14.02   |
| <b>Longfin Dace</b>   | 42    | 14.45   | 247   | 46.32   | 267    | 51.29   |
| Red Shiner            | 7     | 2.41    | 2     | 0.38    | 0      | 0       |
| <b>Roundtail Chub</b> | 0     | 0       | 0     | 0       | 0      | 0       |
| Smallmouth Bass       | 0     | 0       | 1     | 0.19    | 0      | 0       |
| <b>Sonora Sucker</b>  | 8     | 2.75    | 72    | 13.50   | 111    | 21.32   |
| <b>Spikedace</b>      | 3     | 1.03    | 2     | 0.38    | 6      | 1.15    |
| Western Mosquitofish  | 46    | 15.83   | 23    | 4.31    | 10     | 1.92    |
| Yellow Bullhead       | 0     | 0       | 0     | 0       | 0      | 0       |
| Total N               | 166   |         | 528   |         | 604    |         |
| Area                  | 290.6 |         | 533.3 |         | 520.5  |         |
| Density               | 57.13 |         | 99.01 |         | 116.03 |         |

Table A6 continued. Gila River at Riverside Iron Bridge site.

| Species               | 2006  |         | 2007   |         | 2008   |         |
|-----------------------|-------|---------|--------|---------|--------|---------|
|                       | N     | Density | N      | Density | N      | Density |
| Channel Catfish       | 0     | 0       | 0      | 0       | 0      | 0       |
| Common Carp           | 0     | 0       | 0      | 0       | 0      | 0       |
| <b>Desert Sucker</b>  | 25    | 7.74    | 98     | 53.11   | 267    | 91.01   |
| Fathead Minnow        | 2     | 0.62    | 0      | 0       | 0      | 0       |
| Flathead Catfish      | 0     | 0       | 0      | 0       | 1      | 0.34    |
| Green Sunfish         | 0     | 0       | 0      | 0       | 0      | 0       |
| Largemouth Bass       | 0     | 0       | 0      | 0       | 0      | 0       |
| <b>Loach Minnow</b>   | 11    | 3.40    | 60     | 32.51   | 50     | 17.04   |
| <b>Longfin Dace</b>   | 35    | 10.83   | 187    | 101.33  | 436    | 148.62  |
| Red Shiner            | 19    | 5.88    | 5      | 2.71    | 0      | 0       |
| <b>Roundtail Chub</b> | 0     | 0       | 0      | 0       | 0      | 0       |
| Smallmouth Bass       | 0     | 0       | 0      | 0       | 1      | 0.34    |
| <b>Sonora Sucker</b>  | 6     | 1.86    | 25     | 13.55   | 69     | 23.52   |
| <b>Spikedace</b>      | 14    | 4.33    | 151    | 81.83   | 524    | 178.61  |
| Western Mosquitofish  | 0     | 0       | 2      | 1.08    | 0      | 0       |
| Yellow Bullhead       | 0     | 0       | 0      | 0       | 0      | 0       |
| Total N               | 112   |         | 528    |         | 1348   |         |
| Area                  | 323.1 |         | 184.5  |         | 293.4  |         |
| Density               | 34.67 |         | 286.12 |         | 459.49 |         |

| Species               | 2009   |         | 2010   |         | 2011   |         |
|-----------------------|--------|---------|--------|---------|--------|---------|
|                       | N      | Density | N      | Density | N      | Density |
| Channel Catfish       | 0      | 0       | 0      | 0       | 0      | 0       |
| Common Carp           | 0      | 0       | 0      | 0       | 2      | 0.06    |
| <b>Desert Sucker</b>  | 28     | 8.40    | 144    | 40.19   | 71     | 2.25    |
| Fathead Minnow        | 0      | 0       | 4      | 1.12    | 1      | 0.03    |
| Flathead Catfish      | 0      | 0       | 0      | 0       | 0      | 0       |
| Green Sunfish         | 0      | 0       | 1      | 0.28    | 0      | 0       |
| Largemouth Bass       | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Loach Minnow</b>   | 48     | 14.39   | 5      | 1.40    | 77     | 2.44    |
| <b>Longfin Dace</b>   | 196    | 58.77   | 63     | 17.58   | 138    | 4.37    |
| Red Shiner            | 0      | 0       | 1      | 0.28    | 31     | 0.98    |
| <b>Roundtail Chub</b> | 0      | 0       | 0      | 0       | 0      | 0       |
| Smallmouth Bass       | 0      | 0       | 0      | 0       | 0      | 0       |
| <b>Sonora Sucker</b>  | 34     | 10.20   | 54     | 15.07   | 129    | 4.08    |
| <b>Spikedace</b>      | 118    | 35.38   | 128    | 35.73   | 39     | 1.23    |
| Western Mosquitofish  | 19     | 5.70    | 12     | 3.35    | 107    | 3.38    |
| Yellow Bullhead       | 0      | 0       | 0      | 0       | 0      | 0       |
| Total N               | 443    |         | 412    |         | 595    |         |
| Area                  | 333.5  |         | 358.3  |         | 3161.2 |         |
| Density               | 132.84 |         | 115.00 |         | 18.82  |         |

Table A6 continued. Gila River at Riverside Iron Bridge site.

| Species               | 2012  |         | 2013  |         | 2014  |         |
|-----------------------|-------|---------|-------|---------|-------|---------|
|                       | N     | Density | N     | Density | N     | Density |
| Channel Catfish       | 0     | 0       | 0     | 0       | 0     | 0       |
| Common Carp           | 0     | 0       | 0     | 0       | 1     | 0.15    |
| <b>Desert Sucker</b>  | 6     | 1.23    | 2     | 1.13    | 27    | 4.11    |
| Fathead Minnow        | 0     | 0       | 0     | 0       | 3     | 0.46    |
| Flathead Catfish      | 0     | 0       | 0     | 0       | 0     | 0       |
| Green Sunfish         | 0     | 0       | 0     | 0       | 0     | 0       |
| Largemouth Bass       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>   | 2     | 0.41    | 4     | 2.27    | 17    | 2.59    |
| <b>Longfin Dace</b>   | 7     | 1.43    | 23    | 13.04   | 65    | 9.90    |
| Red Shiner            | 0     | 0       | 0     | 0       | 1     | 0.15    |
| <b>Roundtail Chub</b> | 0     | 0       | 0     | 0       | 0     | 0       |
| Smallmouth Bass       | 7     | 1.43    | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b>  | 3     | 0.61    | 0     | 0       | 61    | 9.29    |
| <b>Spikedace</b>      | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish  | 3     | 0.61    | 0     | 0       | 7     | 1.07    |
| Yellow Bullhead       | 0     | 0       | 0     | 0       | 0     | 0       |
| Total N               | 28    |         | 29    |         | 182   |         |
| Area                  | 489.5 |         | 176.4 |         | 656.3 |         |
| Density               | 5.72  |         | 16.44 |         | 27.73 |         |

| Species               | 2015   |         | 2016  |         | 2017   |         |
|-----------------------|--------|---------|-------|---------|--------|---------|
|                       | N      | Density | N     | Density | N      | Density |
| Channel Catfish       | 0      | 0       | 0     | 0       | 0      | 0       |
| Common Carp           | 0      | 0       | 0     | 0       | 0      | 0       |
| <b>Desert Sucker</b>  | 155    | 48.65   | 37    | 6.60    | 102    | 3.54    |
| Fathead Minnow        | 0      | 0       | 0     | 0       | 0      | 0       |
| Flathead Catfish      | 0      | 0       | 0     | 0       | 0      | 0       |
| Green Sunfish         | 0      | 0       | 1     | 0.18    | 0      | 0       |
| Largemouth Bass       | 0      | 0       | 0     | 0       | 0      | 0       |
| <b>Loach Minnow</b>   | 14     | 4.39    | 8     | 1.43    | 40     | 1.39    |
| <b>Longfin Dace</b>   | 178    | 55.87   | 62    | 11.06   | 14     | 0.49    |
| Red Shiner            | 0      | 0       | 0     | 0       | 0      | 0       |
| <b>Roundtail Chub</b> | 0      | 0       | 0     | 0       | 0      | 0       |
| Smallmouth Bass       | 0      | 0       | 0     | 0       | 0      | 0       |
| <b>Sonora Sucker</b>  | 51     | 16.01   | 6     | 1.07    | 40     | 1.39    |
| <b>Spikedace</b>      | 9      | 2.83    | 30    | 5.35    | 152    | 5.28    |
| Western Mosquitofish  | 3      | 0.94    | 2     | 0.36    | 0      | 0       |
| Yellow Bullhead       | 0      | 0       | 0     | 0       | 0      | 0       |
| Total N               | 410    |         | 146   |         | 348    |         |
| Area                  | 318.6  |         | 560.4 |         | 2878.4 |         |
| Density               | 128.70 |         | 26.05 |         | 12.09  |         |

Table A6 continued. Gila River at Riverside Iron Bridge site.

| Species               | 2018  |         | 2019   |         | 2020   |         |
|-----------------------|-------|---------|--------|---------|--------|---------|
|                       | N     | Density | N      | Density | N      | Density |
| Channel Catfish       | 0     | 0       | 0      | 0       | 0      | 0       |
| Common Carp           | 0     | 0       | 0      | 0       | 0      | 0       |
| <b>Desert Sucker</b>  | 34    | 11.04   | 139    | 46.40   | 189    | 38.20   |
| Fathead Minnow        | 0     | 0       | 0      | 0       | 3      | 0.61    |
| Flathead Catfish      | 1     | 0.32    | 0      | 0       | 0      | 0       |
| Green Sunfish         | 0     | 0       | 0      | 0       | 0      | 0       |
| Largemouth Bass       | 0     | 0       | 0      | 0       | 0      | 0       |
| <b>Loach Minnow</b>   | 18    | 5.85    | 157    | 52.40   | 133    | 26.88   |
| <b>Longfin Dace</b>   | 41    | 13.32   | 66     | 22.03   | 23     | 4.65    |
| Red Shiner            | 0     | 0       | 0      | 0       | 4      | 0.81    |
| <b>Roundtail Chub</b> | 0     | 0       | 0      | 0       | 0      | 0       |
| Smallmouth Bass       | 0     | 0       | 0      | 0       | 0      | 0       |
| <b>Sonora Sucker</b>  | 19    | 6.17    | 72     | 24.03   | 269    | 54.36   |
| <b>Spikedace</b>      | 22    | 7.15    | 89     | 29.71   | 22     | 4.45    |
| Western Mosquitofish  | 6     | 1.95    | 12     | 4.01    | 34     | 6.87    |
| Yellow Bullhead       | 0     | 0       | 0      | 0       | 0      | 0       |
| Total N               | 141   |         | 535    |         | 677    |         |
| Area                  | 307.9 |         | 299.6  |         | 494.8  |         |
| Density               | 45.80 |         | 178.58 |         | 136.82 |         |

| Species               | 2021  |         |
|-----------------------|-------|---------|
|                       | N     | Density |
| Channel Catfish       | 1     | 1.18    |
| Common Carp           | 0     | 0       |
| <b>Desert Sucker</b>  | 0     | 0       |
| Fathead Minnow        | 0     | 0       |
| Flathead Catfish      | 0     | 0       |
| Green Sunfish         | 0     | 0       |
| Largemouth Bass       | 0     | 0       |
| <b>Loach Minnow</b>   | 9     | 10.60   |
| <b>Longfin Dace</b>   | 1     | 1.18    |
| Red Shiner            | 0     | 0       |
| <b>Roundtail Chub</b> | 0     | 0       |
| Smallmouth Bass       | 0     | 0       |
| <b>Sonora Sucker</b>  | 0     | 0       |
| <b>Spikedace</b>      | 0     | 0       |
| Western Mosquitofish  | 0     | 0       |
| Yellow Bullhead       | 0     | 0       |
| Total N               | 11    |         |
| Area                  | 84.9  |         |
| Density               | 12.95 |         |

Table A7. Number (N) and density (fish/100 m<sup>2</sup>) of fishes collected in the Gila River at the Cherokee Canyon site, 2009 - 2021. Native species are bolded.

| Species              | 2009  |         | 2010   |         | 2011  |         |
|----------------------|-------|---------|--------|---------|-------|---------|
|                      | N     | Density | N      | Density | N     | Density |
| Channel Catfish      | 0     | 0       | 0      | 0       | 0     | 0       |
| Common Carp          | 0     | 0       | 0      | 0       | 0     | 0       |
| <b>Desert Sucker</b> | 8     | 2.75    | 119    | 41.94   | 5     | 2.28    |
| Fathead Minnow       | 1     | 0.34    | 0      | 0       | 0     | 0       |
| Flathead Catfish     | 0     | 0       | 0      | 0       | 1     | 0.46    |
| <b>Loach Minnow</b>  | 44    | 15.12   | 201    | 70.83   | 41    | 18.67   |
| <b>Longfin Dace</b>  | 54    | 18.56   | 159    | 56.03   | 11    | 5.01    |
| Red Shiner           | 0     | 0       | 0      | 0       | 0     | 0       |
| <b>Sonora Sucker</b> | 18    | 6.19    | 97     | 34.18   | 1     | 0.46    |
| <b>Spikedace</b>     | 19    | 6.53    | 270    | 95.15   | 5     | 2.28    |
| Western Mosquitofish | 1     | 0.34    | 0      | 0       | 35    | 15.94   |
| Yellow Bullhead      | 0     | 0       | 1      | 0.35    | 0     | 0       |
| Total N              | 145   |         | 847    |         | 99    |         |
| Area                 | 291.0 |         | 283.8  |         | 219.6 |         |
| Density              | 49.82 |         | 298.49 |         | 45.07 |         |

| Species              | 2012  |         | 2013  |         | 2014  |         |
|----------------------|-------|---------|-------|---------|-------|---------|
|                      | N     | Density | N     | Density | N     | Density |
| Channel Catfish      | 0     | 0       | 0     | 0       | 0     | 0       |
| Common Carp          | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Desert Sucker</b> | 8     | 1.60    | 0     | 0       | 2     | 0.63    |
| Fathead Minnow       | 0     | 0       | 0     | 0       | 1     | 0.31    |
| Flathead Catfish     | 3     | 0.60    | 0     | 0       | 1     | 0.31    |
| <b>Loach Minnow</b>  | 14    | 2.80    | 0     | 0       | 21    | 6.61    |
| <b>Longfin Dace</b>  | 49    | 9.81    | 8     | 4.58    | 48    | 15.11   |
| Red Shiner           | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Sonora Sucker</b> | 48    | 9.61    | 0     | 0       | 1     | 0.31    |
| <b>Spikedace</b>     | 0     | 0       | 0     | 0       | 0     | 0       |
| Western Mosquitofish | 50    | 10.01   | 1     | 0.57    | 0     | 0       |
| Yellow Bullhead      | 0     | 0       | 0     | 0       | 0     | 0       |
| Total N              | 172   |         | 9     |         | 74    |         |
| Area                 | 499.3 |         | 174.9 |         | 317.6 |         |
| Density              | 34.45 |         | 5.15  |         | 23.30 |         |



Table A7. Gila River at Cherokee Canyon site.

| Species              | 2015  |         | 2016  |         | 2017   |         |
|----------------------|-------|---------|-------|---------|--------|---------|
|                      | N     | Density | N     | Density | N      | Density |
| Channel Catfish      | 0     | 0       | 0     | 0       | 1      | 0.09    |
| Common Carp          | 0     | 0       | 0     | 0       | 1      | 0.09    |
| <b>Desert Sucker</b> | 59    | 11.11   | 14    | 5.92    | 83     | 7.66    |
| Fathead Minnow       | 1     | 0.19    | 0     | 0       | 0      | 0       |
| Flathead Catfish     | 4     | 0.75    | 0     | 0       | 1      | 0.09    |
| <b>Loach Minnow</b>  | 6     | 1.13    | 12    | 5.07    | 46     | 4.24    |
| <b>Longfin Dace</b>  | 203   | 38.23   | 138   | 58.32   | 201    | 18.55   |
| Red Shiner           | 0     | 0       | 0     | 0       | 0      | 0       |
| <b>Sonora Sucker</b> | 6     | 1.13    | 1     | 0.42    | 19     | 1.75    |
| <b>Spikedace</b>     | 0     | 0       | 0     | 0       | 55     | 5.08    |
| Western Mosquitofish | 1     | 0.19    | 1     | 0.42    | 1      | 0.09    |
| Yellow Bullhead      | 0     | 0       | 0     | 0       | 0      | 0       |
| Total N              | 280   |         | 166   |         | 408    |         |
| Area                 | 531.0 |         | 236.6 |         | 1083.6 |         |
| Density              | 52.73 |         | 70.16 |         | 37.65  |         |

Table A8. Number (N) and density (fish/100 m<sup>2</sup>) of fishes collected in the Gila River at the Ash Canyon site, 2012 - 2021. Native species are bolded.

| Species              | 2012  |         | 2013   |         | 2014   |         | 2015  |         | 2016   |         |
|----------------------|-------|---------|--------|---------|--------|---------|-------|---------|--------|---------|
|                      | N     | Density | N      | Density | N      | Density | N     | Density | N      | Density |
| Channel Catfish      | 21    | 6.77    | 1      | 2.11    | 10     | 0.94    | 10    | 1.61    | 15     | 3.46    |
| Common Carp          | 4     | 1.29    | 0      | 0       | 2      | 0.19    | 0     | 0       | 0      | 0       |
| <b>Desert Sucker</b> | 5     | 1.61    | 0      | 0       | 15     | 1.40    | 41    | 6.59    | 62     | 14.28   |
| Fathead Minnow       | 2     | 0.64    | 19     | 40.03   | 0      | 0       | 0     | 0       | 43     | 9.91    |
| Flathead Catfish     | 8     | 2.58    | 0      | 0       | 2      | 0.19    | 0     | 0       | 2      | 0.46    |
| <b>Loach Minnow</b>  | 6     | 1.93    | 2      | 4.21    | 12     | 1.12    | 5     | 0.80    | 6      | 1.38    |
| <b>Longfin Dace</b>  | 0     | 0       | 2      | 4.21    | 147    | 13.77   | 195   | 31.33   | 104    | 23.96   |
| Red Shiner           | 13    | 4.19    | 38     | 80.07   | 6      | 0.56    | 2     | 0.32    | 354    | 81.56   |
| <b>Sonora Sucker</b> | 0     | 0       | 0      | 0       | 2      | 0.19    | 1     | 0.16    | 1      | 0.23    |
| <b>Spikedace</b>     | 0     | 0       | 0      | 0       | 0      | 0       | 0     | 0       | 0      | 0       |
| Western Mosquitofish | 0     | 0       | 8      | 16.86   | 0      | 0       | 0     | 0       | 6      | 1.38    |
| Total N              | 59    |         | 70     |         | 196    |         | 254   |         | 593    |         |
| Area                 | 310.3 |         | 47.5   |         | 1067.8 |         | 622.4 |         | 434.0  |         |
| Density              | 19.02 |         | 147.49 |         | 18.36  |         | 40.81 |         | 136.62 |         |

| Species              | 2017   |         | 2018  |         | 2019  |         | 2020  |         | 2021  |         |
|----------------------|--------|---------|-------|---------|-------|---------|-------|---------|-------|---------|
|                      | N      | Density | N     | Density | N     | Density | N     | Density | N     | Density |
| Channel Catfish      | 12     | 0.40    | 0     | 0       | 1     | 0.19    | 6     | 0.90    | 3     | 0.81    |
| Common Carp          | 2      | 0.07    | 0     | 0       | 0     | 0       | 1     | 0.15    | 0     | 0       |
| <b>Desert Sucker</b> | 15     | 0.50    | 0     | 0       | 62    | 11.69   | 33    | 4.96    | 0     | 0       |
| Fathead Minnow       | 0      | 0       | 3     | 1.55    | 0     | 0       | 17    | 2.55    | 0     | 0       |
| Flathead Catfish     | 2      | 0.07    | 0     | 0       | 0     | 0       | 0     | 0       | 0     | 0       |
| <b>Loach Minnow</b>  | 12     | 0.40    | 2     | 1.04    | 15    | 2.83    | 21    | 3.16    | 1     | 0.27    |
| <b>Longfin Dace</b>  | 94     | 3.14    | 63    | 32.62   | 71    | 13.38   | 266   | 39.96   | 1     | 0.27    |
| Red Shiner           | 14     | 0.47    | 48    | 24.85   | 22    | 4.15    | 265   | 39.81   | 13    | 3.50    |
| <b>Sonora Sucker</b> | 0      | 0       | 0     | 0       | 3     | 0.57    | 1     | 0.15    | 0     | 0       |
| <b>Spikedace</b>     | 0      | 0       | 0     | 0       | 0     | 0       | 1     | 0.15    | 0     | 0       |
| Western Mosquitofish | 0      | 0       | 11    | 5.69    | 13    | 2.45    | 5     | 0.75    | 0     | 0       |
| Total N              | 151    |         | 127   |         | 187   |         | 616   |         | 18    |         |
| Area                 | 2997.9 |         | 193.2 |         | 530.5 |         | 665.6 |         | 371.3 |         |
| Density              | 5.04   |         | 65.75 |         | 35.25 |         | 92.55 |         | 4.85  |         |



Table A9. Number (N) and density (fish/100 m<sup>2</sup>) of fishes collected in the Gila River at the site below the Sunset Diversion, 2011 - 2021. Native species are bolded. Note that no sampling occurred in 2015 at the site.

| Species              | 2011  |         | 2012   |         | 2013  |         | 2014  |         | 2015 |         |
|----------------------|-------|---------|--------|---------|-------|---------|-------|---------|------|---------|
|                      | N     | Density | N      | Density | N     | Density | N     | Density | N    | Density |
| Black Bullhead       | 0     | 0       | 0      | 0       | 0     | 0       | 0     | 0       |      |         |
| Channel Catfish      | 0     | 0       | 0      | 0       | 0     | 0       | 8     | 1.82    |      |         |
| Common Carp          | 0     | 0       | 3      | 1.26    | 0     | 0       | 1     | 0.23    |      |         |
| <b>Desert Sucker</b> | 0     | 0       | 17     | 7.12    | 0     | 0       | 3     | 0.68    |      |         |
| Fathead Minnow       | 7     | 1.56    | 11     | 4.61    | 14    | 9.79    | 2     | 0.46    |      |         |
| Flathead Catfish     | 0     | 0       | 0      | 0       | 0     | 0       | 1     | 0.23    |      |         |
| <b>Longfin Dace</b>  | 19    | 4.22    | 53     | 22.21   | 16    | 11.18   | 69    | 15.71   |      |         |
| Red Shiner           | 80    | 17.78   | 10     | 4.19    | 17    | 11.88   | 43    | 9.79    |      |         |
| <b>Sonora Sucker</b> | 0     | 0       | 0      | 0       | 0     | 0       | 0     | 0       |      |         |
| Western Mosquitofish | 51    | 11.33   | 253    | 106.00  | 1     | 0.70    | 0     | 0       |      |         |
| Total N              | 157   |         | 347    |         | 48    |         | 127   |         |      |         |
| Area                 | 450.0 |         | 238.7  |         | 143.1 |         | 439.4 |         |      |         |
| Density              | 34.89 |         | 145.38 |         | 33.55 |         | 28.91 |         |      |         |

| Species              | 2016   |         | 2017   |         | 2018 |         | 2019   |         | 2020  |         |
|----------------------|--------|---------|--------|---------|------|---------|--------|---------|-------|---------|
|                      | N      | Density | N      | Density | N    | Density | N      | Density | N     | Density |
| Black Bullhead       | 0      | 0       | 0      | 0       | 0    | 0       | 0      | 0       | 0     | 0       |
| Channel Catfish      | 10     | 0.66    | 2      | 0.36    | 3    | 4.19    | 0      | 0       | 0     | 0       |
| Common Carp          | 1      | 0.07    | 0      | 0       | 0    | 0       | 0      | 0       | 0     | 0       |
| <b>Desert Sucker</b> | 13     | 0.85    | 8      | 1.42    | 0    | 0       | 2      | 2.19    | 0     | 0       |
| Fathead Minnow       | 5      | 0.33    | 10     | 1.78    | 0    | 0       | 2      | 2.19    | 0     | 0       |
| Flathead Catfish     | 3      | 0.20    | 5      | 0.89    | 0    | 0       | 0      | 0       | 0     | 0       |
| <b>Longfin Dace</b>  | 29     | 1.90    | 452    | 80.23   | 2    | 2.79    | 31     | 33.99   | 0     | 0       |
| Red Shiner           | 478    | 31.37   | 175    | 31.06   | 2    | 2.79    | 1      | 1.10    | 0     | 0       |
| <b>Sonora Sucker</b> | 0      | 0       | 3      | 0.53    | 0    | 0       | 0      | 0       | 0     | 0       |
| Western Mosquitofish | 13     | 0.85    | 31     | 5.50    | 0    | 0       | 69     | 75.65   | 24    | 25.93   |
| Total N              | 552    |         | 686    |         | 7    |         | 105    |         | 24    |         |
| Area                 | 1523.9 |         | 563.4  |         | 71.6 |         | 91.2   |         | 92.6  |         |
| Density              | 36.22  |         | 121.77 |         | 9.77 |         | 115.12 |         | 25.93 |         |

Table A9 continued. Gila River at the site below the Sunset Diversion.

| Species              | 2021  |         |
|----------------------|-------|---------|
|                      | N     | Density |
| Black Bullhead       | 2     | 0.49    |
| Channel Catfish      | 28    | 6.81    |
| Common Carp          | 0     | 0       |
| <b>Desert Sucker</b> | 2     | 0.49    |
| Fathead Minnow       | 3     | 0.73    |
| Flathead Catfish     | 1     | 0.24    |
| <b>Longfin Dace</b>  | 5     | 1.22    |
| Red Shiner           | 65    | 15.81   |
| <b>Sonora Sucker</b> | 0     | 0       |
| Western Mosquitofish | 3     | 0.73    |
| Total N              | 109   |         |
| Area                 | 411.0 |         |
| Density              | 26.52 |         |