To: Doug Duncan, U.S. Fish and Wildlife Service

From: Anthony Robinson, Arizona Game and Fish Department

Date: May 5, 2014

Re: Gila River Basin Native Fishes Conservation Program: Cooperative Agreement F09AC00084 Draft Annual Report for the Period Nov. 1, 2012 thru February 5, 2014

COOPERATIVE AGREEMENT TITLE: Arizona CAP Gila River Basin Native Fishes Conservation Program

FUNDING: Approximately $492,234, expended during 11/1/12 – 02/05/14.
Recovery of Natives (RPA 3): $410,574
Control of Nonnatives (RPA 4): $81,669

GENERAL ACTIVITIES:

Arizona Game and Fish Department's (Department) Gila River Basin Native Fish Conservation Program staff (program staff) administered and managed projects. Program staff managed data, added annual monitoring and survey datasets into the overall CAP Master Fish Survey dataset, and added data to the stocking dataset. Program staff attended and participated in Gila Chub, Spikedace and Loach Minnow recovery team meetings, and in Gila River Basin Native Fishes Conservation Program technical and policy committee meetings. Program staff attended the Desert Fishes Council annual meetings in November 2012 and 2013, and gave presentations on native fish conservation. Program staff hired one intern for the 2013 field season. Program staff hired a project biologist to replace Drew Pearson. Approximate expenditures on general administrative activities = $41,379.

Comments: The period for this report began on November 1, 2012 (the day after the end of the last annual report) and ended on February 5, 2014. The period is greater than one year because the Department and U.S. Fish and Wildlife Service (USFWS) agreed to move the start date of the annual modification to the beginning of February. The sixth modification to the cooperative agreement for the full fifth year of funding became effective on February 6, 2013.

Drew Pearson, the CAP Project Biologist (Wildlife Specialist I) was killed by lightning in September 2013, and the position was refilled in January 2014.

PRIORITY ACTIONS IDENTIFIED IN COOPERATIVE AGREEMENT APPENDIX:

1. Acquire Loach Minnow and Spikedace
2. Muleshoe Ecosystem stream and spring repatriations
3. Fossil Creek repatriations
4. Fresno Canyon repatriations
5. Bonita Creek renovation and repatriations
6. Arizona trout stream Loach Minnow repatriations
7. Gila Topminnow stockings

8. Arnett Creek repatriations
9. Redrock Canyon/Sonoita Creek renovation and repatriations
10. Morgan City Wash and Chalky Spring repatriations
11. Turkey Creek and O'Donnell Creek repatriations
12. Post Canyon/Freeman Spring repatriations—project dropped in 2012
13. Spring Creek (Tonto Creek drainage) renovation and repatriations
14. Mineral Creek renovation and repatriations
15. Blue River repatriations

PRIORITY ACTIONS ADDED AFTER COOPERATIVE AGREEMENT WAS FINALIZED:

San Pedro Pond Stockings
Miscellaneous Stock Tank Surveys
Assess Potential Repatriation Waters
Bubbling Ponds O&M

TASK-SPECIFIC ACTIVITIES:

Old and new task numbers are given where known. Post-repatriation monitoring (task 3-84b) is included under each repatriation task, and not as a separate task. Sites where native fish were repatriated and subsequent monitoring information indicated that the species had established populations are reported in Appendix 1.

Acquire Spikedace and Loach Minnow for propagation (Task 3-57 and 3-75g).

Description: The purpose of this task is to acquire Spikedace *Meda fulgida* and Loach Minnow *Tiaroga cobitis* from all extant lineages and bring them to a facility for propagation and to establish refuge populations. Each population is likely genetically unique (Tibbets and Dowling 1996) and represents a significant remnant of the evolutionary legacy of these declining species. It thus is essential to acquire individuals from them as an assurance against extirpation of these distinctive lineages. Intensive, directed efforts to capture individuals, bring them into a holding and propagation facility, build up their numbers, augment source stocks, and replicate populations into streams, must occur immediately. The Department will also coordinate with tribes and the State of New Mexico to acquire Spikedace or Loach Minnow from their jurisdictions. Fish will be transported alive to Bubbling Ponds Native Fish Conservation Facility (BPNFCF). An additional facility may be used if agreed upon by partners.

Status: Ongoing.

Expenditures: Approximately $1,970.

Preliminary Results: The Southwestern Native Aquatic Resource and Recovery Center (SNARRC) transferred 41 San Francisco River Loach Minnow to BPNFCF staff on July 10, 2013. The fish were quarantined for a short time and then placed into a circular holding tank in the outside caged-portion of the facility. No other Loach Minnow, or any Spikedace were brought in to BPNFCF during the reporting period.

Obstacles: The Department had planned to conduct surveys in the East Fork of the Black River to try to find and collect Loach Minnow, but the plans were cancelled because USFS contractors were scheduled to sample the same area to detect Loach Minnow. The Department will be unable to acquire White River lineage of Loach Minnow, unless the White Mountain Apache tribe provides the fish. Also, Loach Minnow and Spikedace may still exist in Eagle Creek on the portion that flows through San Carlos Apache tribal land, but the Tribe has yet to, and may not, grant permission to non-tribal members to survey the portion of Eagle Creek on their land.

Comments: Status of lineages now at BPNFCF: the facility has Spikedace from three (Aravaipa Creek, upper Gila River, and the Gila River forks) of the five supposedly extant populations. Spikedace have not been detected in the upper Verde River since 1999, even with nearly annual surveys by the Department and USFS. Spikedace have not been captured since 1989 in Eagle Creek even though fixed sites on non-tribal lands are sampled annually. The BPNFCF also has Loach Minnow from four (Aravaipa Creek, Blue River, Gila River Forks, and San Francisco River) of the eight supposedly extant populations. Loach Minnow have not been detected in Eagle Creek since 1997, even with annual surveys of fixed sites on non-tribal lands. Loach Minnow have not been detected in East Fork Black River drainage since 2005, even with surveys during 2007, 2008, 2009, 2012, and 2013. The Program has so far been unable to acquire White River Loach Minnow from the White Mountain Apache Tribe. Additional San Francisco River Loach Minnow need to be brought into BPNFCF to attain the standard refuge population size (500 reproducing adults). Upper Gila River Loach Minnow are abundant, so have not yet been brought into BPNFCF.

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Muleshoe ecosystem stream and spring repatriations (Task 3-47 and 3-75f).

Description: A high priority of the CAP Program is to replicate remaining populations of federally-threatened Loach Minnow and Spikedace into suitable protected streams in the Gila River basin. Aravaipa Creek, a tributary to the lower San Pedro River, is host to sizeable populations of both species, and is thus a source for needed population replications. Hot Springs Canyon and Redfield Canyon are partly located on the Muleshoe Ranch Cooperative Management Area and are tributaries to the middle San Pedro River that retain native fish assemblages to the near exclusion of non-native forms. Attributes of these streams that help minimize invasions by non-natives include isolation from the mainstem San Pedro River by over 8 km of normally-dry streambed and a long reach of ephemeral discharge of the San Pedro River at and upstream from its confluence with Hot Springs Canyon. A barrier was built in Hot Springs Canyon in 2010 and one is scheduled to be built in Redfield Canyon in 2015. Several other waters on the Muleshoe Ranch Cooperative Management Area were targeted for repatriations of Gila Topminnow *Poeciliopsis occidentalis* and Desert Pupfish *Cyprinodon macularius*, including but not limited to Swamp Springs Canyon, Cherry Spring Canyon, and two unnamed springs near the Muleshoe Ranch Cooperative Management Area headquarters. The Department was tasked with completing necessary environmental compliance, development of translocation protocols (including post-translocation monitoring needs), repatriating Spikedace and Loach Minnow to Hot Springs Canyon and Redfield Canyon and Gila Topminnow and Desert Pupfish to suitable waters, and conducting post-repatriation

monitoring to determine if the species establish. The Department will conduct augmentation stockings if necessary to establish populations.

Status: Ongoing.

Expenditures: Approximately $49,260.

Preliminary Results: Program staff analyzed data and wrote a report summarizing stocking and monitoring activities during 2012 (Robinson et al. 2013a).

Program staff collaborated with The Nature Conservancy (TNC) in removal of Green Sunfish *Lepomis cyanellus* from Redfield Canyon on July 1, 2013. The stream was electrofished (3,995 seconds) and seven collapsible minnow traps and 11 collapsible mini-hoop nets were set. Forty-one Green Sunfish were captured and removed. Thirty-nine of the sunfish were captured in the large pool immediately upstream of the confluence with Swamp Spring Canyon; this is the same pool where most of the Green Sunfish were captured in 2012.

The annual post-stocking monitoring of native fishes in the Muleshoe Cooperative Management Area waters was conducted during September 14-16, 2013. On September 15, Program, Bureau of Land Management (BLM), and TNC staff surveyed Redfield Canyon by backpack electrofishing three fixed and four randomly selected sites. No Spikedace or Loach Minnow were captured. Fish captured included 220 Gila Chub *Gila intermedia*, 117 Gila Topminnow, 83 Desert Sucker *Pantosteus clarki*, 27 Sonora Sucker *Catostomus insignis*, 22 Speckled Dace *Rhinichthys osculus*, 20 Longfin Dace *Agosia chrysogaster*, and four Green Sunfish. Hot Springs Canyon was surveyed on September 16, by backpack electrofishing through three fixed and six random sites. Nineteen Spikedace and 45 Loach Minnow were captured. Nine of the Loach Minnow and one of the Spikedace were ≤45 mm TL. Spikedace were captured in the middle and lower reaches, whereas Loach Minnow were captured in all three reaches. Also captured were 569 Longfin Dace, 404 Speckled Dace, 66 Gila Chub, 87 Desert Sucker, and 4 Sonora Sucker. Program and TNC staff also monitored Larry & Charlie Tank on September 14 using ten collapsible minnow traps. Thirty Desert Pupfish and 18 Lowland Leopard Frog *Lithobates yavapaiensis* tadpoles were captured. Gila Topminnow were observed in Headquarters Spring at the road crossing and downstream.

Obstacles: The program was short-staffed for monitoring, but all cooperators contributed personnel so were able to complete the monitoring.

Comments: Did not monitor Gila Topminnow in Secret Spring, Swamp Springs Canyon, or Cherry Spring Canyon because those populations are considered established and hence will be monitored by the Department's regional or Nongame Branch staff. These Gila Topminnow populations count towards recovery of the species. Spikedace and Loach Minnow were last stocked in Hot Springs Canyon in 2011 and in Redfield Canyon in 2010. In Hot Springs Canyon, Spikedace and Loach Minnow were about as abundant as they were in 2011, but less abundant than in 2012. However, the presence of fish ≤45 mm TL in 2013 indicates that they spawned since they were last stocked. Neither

Spikedace nor Loach Minnow were captured in Redfield Canyon in 2012 or 2013 so it is unclear if they persist there.

Fossil Creek repatriation of listed fish species (Task 3-75l).

Description: A fish barrier was constructed in Fossil Creek during 2004 to prevent upstream movement of nonnative fishes. Later during 2004, native fish were salvaged and held while the stream above the fish barrier was treated with chemical piscicides to remove nonnative fishes. Early in 2005, salvaged native fish were returned to the stream, and then during June, Arizona Public Service returned full flows to Fossil Creek after the Childs-Irving Hydroelectric Project facilities were decommissioned. The objective of this task was to stock and establish several federally listed species into Fossil Creek. Highest priority species to stock were Spikedace, Loach Minnow, and Longfin Dace. Lower priority species were Desert Pupfish, Gila Topminnow, and Razorback Sucker *Xyrauchen texanus*.

Status: Ongoing.

Expenditures: Approximately $39,408.

Preliminary Results: Program staff led the Fossil Creek Native Fish Management Working Group meeting on February 28, 2013. Program staff finalized the 2013 implementation plan in July 2013.

Program staff led monitoring and stocking activities during 2013. During July 30-31, Gila Topminnow and Longfin Dace were monitored using minnow traps, seining, and dip netting. A total of 60 collapsible minnow traps were set; 28 in the reach between Fossil Springs dam and High Falls (Reach 1), 22 in the reach between the falls at Irving and Sally May Wash (Reach 3), and 10 in the reach between Sally may Wash and the constructed fish barrier (Reach 4). Four hundred fifty-five Gila Topminnow, 375 chub, 177 Speckled Dace, 9 Sonora Sucker, 2 Desert Sucker, and 1 Longfin Dace were captured. Gila Topminnow were captured in all reaches sampled, but longfin only in Reach 4. For seining, 14 hauls were done in Reach 1, 8 in Reach 3, and 9 in reach 4. The same species plus Spikedace were captured by seining; 153 topminnow (reaches 1, 3, and 4), 2 Longfin Dace (Reach 4) and 61 Spikedace (Reach 4) were captured. Dip netting was only completed in Reach 1 (11 sweeps), and 131 Gila Topminnow, 5 chub, and 1 Speckled Dace were captured.

Program staff snorkeled to monitor Spikedace and Loach Minnow. During August 13-14, program staff snorkeled through 15 fixed and 3 opportunistic sites in the reach between Fossil Springs and Fossil Springs dam (Reach 0) and 41 fixed and 3 opportunistic sites in Reach 1, covering about 33% (1,407 m) of the 4,300 m length in the reaches. Spikedace and Gila Topminnow were observed, but not any Loach Minnow. Twenty-six Spikedace were observed, 5 of which (19.2% of total) were less than 40 mm TL. All Spikedace were observed within Reach 1 within 300 m of stocking sites. Twenty-three Gila Topminnow were observed during snorkeling, all within Reach 1. Three of the sites were within 100 m of a previous stocking site, but one was about 700 m

downstream and another was about 1,500 m downstream of the closest upstream stocking site.

On August 27, 2013 Program staff snorkeled through 46 sites in Reach 4 and three sites in the lowermost portion of Reach 3 to detect the presence of Spikedace that were stocked into that reach during October 2012. Three hundred fourteen Spikedace (11% were <40 mm TL), 65 Gila Topminnow (6% were < 10 mm TL), and 5 Longfin Dace (all > 40 mm TL) were observed. Spikedace were observed in 16 sites all within Reach 4 near the stocking sites and downstream for about 2 km. Gila Topminnow, which were not stocked into Reach 4, but dispersed down from Reach 3, were found as far down as 2.2 km downstream from Sally May Wash. Longfin Dace were detected within the uppermost 1 km of Reach 4.

The only species stocked into Fossil Creek during 2013 was Loach Minnow. On September 25, 951 Loach Minnow were stocked: 418 into a location about 200-300 m upstream from Fossil Springs dam, and 533 into a location about 400-500 m upstream from the dam. Fish were in good condition when stocked and behaved normally afterwards. Four Loach Minnow died during the transport.

Obstacles: We had planned to stock Longfin Dace (from Tangle Creek) in autumn 2013, but became short-staffed so cancelled. The SNARRC could not provide the program with Razorback Suckers, so none were stocked in 2013.

Comments: Fossil Creek was renovated by the Department and its partners USFWS, U.S. Forest Service, in September 2012. Spikedace were stocked into the renovated reach (Reach 4) in October 2012. Of the five species stocked into Fossil Creek since 2007, Gila Topminnow are reproducing, persisting from year to year, and have expanded their distribution throughout reaches 1 through 4, and so are considered established, and the population can count towards recovery. Spikedace appear to have reproduced and persisted in Reach 1, and have at least persisted for one year in Reach 4, so they can probably be considered to be in the early stage of population establishment. Targeted monitoring for Longfin Dace was not completed every year, but nonetheless the species was detected in 2008, 2009, 2010, and 2013, but none were detected in 2011, and only a few were detected in 2013 so if a population has established it appears to be small. Loach Minnow do not appear to have established a population, or if they are, they are extremely rare; only five were detected (during all types of monitoring) in 2008, two in 2009, none in 2010, one in 2011, and none in 2013. For Razorback Sucker, over 1,500 were stocked from 2007 thru 2009, and the species was detected during monitoring in 2008 and 2009, but not since, and so are therefore considered to have failed to establish a population in Fossil Creek.

Fresno Canyon repatriations (Task 4-64b).

Description: Fresno Canyon is a major tributary to Sonoita Creek which is a major tributary of the Santa Cruz River about 24 km northeast of Nogales Arizona. Fresno Canyon is within the Sonoita Creek State Natural Area and is managed by Arizona State Parks. The canyon contains Gila Topminnow, Sonora Mud Turtles *Kinosternon sonoriense,* and Canyon Treefrogs *Hyla arenicolor* in an approximately 600-m long

perennial section. Nonnative species found within the canyon include Green Sunfish, American Bullfrog *Rana catesbeiana* and crayfish. In an effort to remove nonnative aquatic species from the drainage, The Department was to chemically renovate Fresno Canyon, and if necessary stock Gila Topminnow if they didn't naturally disperse from Coal Mine Canyon. If the renovated stream was deemed suitable for establishment of Longfin Dace and Gila Chub, these species also would be stocked.

Status: Ongoing.

Expenditures: $7,882.

Preliminary Results: Program staff coordinated with the San Rafael Cattle Company owner throughout 2013 regarding collection of Gila Chub from Sheehy Spring as a source for repatriations to Fresno Canyon. On May 14, 2013, 25 Western mosquitofish were collected from Sheehy Spring, assessed for external parasites, and then shipped to Western Washington Disease Diagnostics Laboratory for pathogen analysis. No parasites or pathogens of concern were detected. Program staff coordinated with the landowner (San Rafael Cattle Company) at Sheehy Spring regarding collection and removal of Gila Chub. The Department's Native Fish Program conducted annual monitoring at Sheehy Spring in June 2013, and only captured 68 Gila Chub. The landowner was concerned about removing Gila Chub given that so few were captured. Program staff provided the landowner with several alternatives, but the issue did not get resolved during the reporting period.

Obstacles: Only 68 Gila Chub were captured during annual monitoring, so a direct translocation from Sheehy to Fresno was decided against.

Comments: The landowner has indicated support for removing some of the Gila Chub from Sheehy Spring to establish populations elsewhere. However, during monitoring of Sheehy Spring in June 2013, only 68 chub were captured during one night of monitoring by USFWS and the Department, which concerned the biologists from both agencies. Department and USFWS staff expressed concerns about removing too many fish from the population, and so Program staff emailed the landowner in July 2013, and outlined four courses of action for 2013. 1.) No action: do not collect any chub from Sheehy and hope that their numbers rebound by next year. 2.) Collect as many juvenile chub as possible and take them to BPNFCF. The fish could be held for two years and allowed to spawn, after which some of the adults and offspring would be returned to Sheehy Spring. The remaining offspring would be released into Fresno Canyon or another captive or wild location. 3.) Collect at least 50 juvenile chub from Sheehy and directly translocate them to Fresno Canyon. Repeat the process for several years, to avoid a founder-effect at Fresno Canyon. If the Sheehy population only has 500 individuals, removal of 50 fish would represent 10% of the population. 4.) Collect as many chub as possible from Sheehy and hold them in a closed system, either a suitable stock tank on the landowner's property, a hatchery pond on our facility, or both. Allow these chub to reproduce and then take offspring for translocation to Fresno and return remaining chub to Sheehy (offspring and broodstock alike). While the chub are held in these locations, perform some habitat

improvements at Sheehy (removing excess riparian vegetation to decrease shading and allow for better access. The landowner replied back that he wanted more information about abundances in past years, which Program staff provided. But there was not any further follow-up during the reporting period. Program staff will coordinate with the landowner to remove chub from Sheehy Spring in 2014.

Bonita Creek renovation and repatriations (Task 4-70b).

Description: Bonita Creek is a tributary to the Gila River, near Safford, Arizona. Bonita Creek drains south off of the San Carlos Reservation and the lower portion is within the Gila Box. Perennial flow begins about 29 km upstream from the mouth, although intermittency is common downstream. Safford has an infiltration gallery and associated transmission pipeline on Bonita Creek to supply municipal water for the city and the surrounding communities. The gallery system is located about 5.6 km above the mouth of Bonita Creek, and a small portion of the stream below the infiltration gallery dike is typically dry.

Except for Fathead Minnow, nonnative fishes are limited to downstream of the infiltration gallery. Nonnative species present include Green Sunfish, Smallmouth Bass *Micropterus dolomieu*, Channel Catfish *Ictalurus punctatus*, Black Bullhead *Ameiurus melas*, Yellow Bullhead *Ameiurus natalis*, Fathead Minnow *Pimephales promelas*, Red Shiner *Cyprinella lutrensis*, Common Carp *Cyprinus carpio*, and Western Mosquitofish *Gambusia affinis*. Native fish species present in Bonita Creek include Gila Chub, Longfin Dace, Speckled Dace, Sonora Sucker, and Desert Sucker. In addition, approximately 4,000 Razorback Sucker were stocked in 1987, but none have been observed since 1991.

In 2008, a Reclamation funded fish barrier was constructed in the lower reach of Bonita Creek, about 2.1 km upstream from the Gila River confluence. Tasks for the Department were to chemically treat (renovate) the 4.25 km perennial reach between the barrier and the infiltration gallery dike to remove all fishes. Before treatment, individuals of each native species were to be salvaged from the stream and held on site or nearby in aerated tanks during the renovation. After determining the success of the renovation, salvaged native fishes were to be returned to the stream near their point of capture. Additional native species considered for repatriation included Razorback Sucker, Spikedace, Loach Minnow, Desert Pupfish, and Gila Topminnow. Spikedace, Loach Minnow, Gila Topminnow, and Desert Pupfish were also to be stocked into the perennial portion of Bonita Creek upstream of the infiltration gallery.

Status: Ongoing.

Expenditures: Approximately $1,970.

Preliminary Results: The only work done on this task was coordination with BLM staff regarding annual monitoring and stocking for 2013 and 2014.

Obstacles: Because of scheduling conflicts, program staff did not participate in the 2013 annual monitoring. Because of staff shortages, program staff did not complete scheduled topminnow stocking in upper Bonita Creek in 2013. BLM staff did not think there was enough suitable habitat for Loach Minnow or Spikedace in upper Bonita Creek, so those two species were not stocked in 2013.

Eradication of nonnative fish from the previously treated reach is likely only possible with complete drying or by chemical treatment. There will likely be some public opposition to a second renovation.

Comments: BLM continues to lead efforts to remove Green Sunfish and other nonnative fish predators from the treated reach. Over 10,000 Green Sunfish have been removed, but they remain abundant, and there appears to be a shift towards smaller fish. Therefore, it is very unlikely that Green Sunfish and other nonnative fishes can be eradicated from the previously treated reach of Bonita Creek by trapping or other fishing gears. A second Bonita Creek renovation is on the nonnative fish control projects priority list for the Department.

Program staff, in spring 2014, will lead a habitat survey throughout the upper portion of Bonita Creek to gather information to better assess if more Spikedace and Loach Minnow should be stocked.

Arizona trout stream Loach Minnow repatriations (Task 3-38 and 3-75b).

Description: Higher elevation cold-water streams in the Gila River basin in eastern Arizona historically were occupied by a suite of native fishes including Apache trout *Oncorhynchus gilae apache*, Gila Trout *Oncorhynchus gilae* (also present in New Mexico), chubs of the genus Gila, Speckled Dace, Loach Minnow, Spikedace, Desert Sucker and Sonora Sucker. The native trouts were nearly eliminated by a combination of angler removal, stream renovation to enhance introduced trouts of several species, and hybridization with and genetic swamping by alien Rainbow Trout *Oncorhynchus mykiss*. As a result of contracting range and diminishing numbers, both native trouts were federally listed as endangered. A management strategy for the native kinds was developed that incorporated the placement of fish barriers on selected streams, renovation upstream to remove all fishes, and restocking with pure strains of the native trout. However, this approach did not always accommodate repatriation of other native species, which were largely extirpated by earlier human impacts or the combined prior stream management for non-native trouts and subsequent management for native trout. A fully restored native fish community upstream from barriers in these streams would include the native trout plus the native minnows and suckers. Repatriation and improved population status for the nongame native fishes will conserve these native species.

The Department will perform repatriation stockings of native non-game fishes into eastern Arizona streams that are managed for Apache trout. Priority stream sites are those with fish barriers planned or in place, and which are occupied by or scheduled for stocking with native trout. Such streams already have been identified as part of the recovery planning and implementation programs for Apache and Gila trouts. Stocking

into other suitable streams may be considered but should not interfere with repatriation to priority streams. Loach Minnow is the priority species to stock. Other lower priority species to stock are non-listed and include chubs, Speckled Dace, Desert Sucker, and Sonora Sucker. Source populations should be geographically nearest downstream neighbors to the repatriation stream, and number of individuals removed should not obviously deplete the source. Multiple stockings into each repatriation stream should be performed for at least three consecutive years or until the desired populations are established, and beyond that for genetics management.

Status: Ongoing.

Expenditures: None.

Preliminary Results: No work was completed on this task during the reporting period.

Obstacles: Same as previous report. Finding Loach Minnow in the Three Forks area. Agreement with Apache Sitgreaves National Forest regarding suitable streams to stock Loach Minnow into once we do find and propagate Three Forks Loach Minnow.

Comments: The Department's conservation and mitigation program (CAMP) is tasked with establishing two Loach Minnow populations. Therefore, this may be an opportunity to either partner with the Department's CAMP or let them be fully responsible for repatriation of Loach Minnow to Black River drainage Apache Trout streams (e.g., West Fork Black River and Bear Wallow Creek). However, there may be other opportunities to establish Loach Minnow in the lower reaches of native trout streams. For example, the Department plans to renovate Marijilda Creek in the Pinaleno Mountains and subsequently stock Gila Trout. The lower portion of the stream is low enough in gradient, and has riffles, so may be suitable for Loach Minnow, and is within historic range.

Gila Topminnow stockings (Task 3-37 and 3-75a).

Description: A primary goal of the Gila Topminnow draft revised recovery plan (Weedman 1999) is to repatriate Gila Topminnow into suitable sites throughout its historical range. Small isolated habitats still exist that have the potential for successful repatriation efforts that, with long-term management, may allow this species to persist to achieve recovery. Many sites were stocked in the 1980s, but most failed. Many sites were identified as suitable for repatriation efforts and are identified in the draft revised recovery plan and in the 2003 Gila Topminnow and Desert Pupfish status report (Voeltz and Bettaso 2003). The Department focus is on the sites recommended for stocking identified in the recovery plan and status report and will stock about six, but no less than four, sites with Gila Topminnow each year. Gila Topminnow stocks used will be in accordance with the draft revised recovery plan. Gila Topminnow repatriation sites are often suitable for Desert Pupfish, because the two species utilize some of the same habitats. Desert Pupfish will be stocked into some of the repatriation sites if habitat is judged suitable.

Status: Ongoing.

Expenditures: Approximately $86,698.

Preliminary Results: Program staff coordinated with appropriate agency, nongovernmental organizations and private individuals relative to old and new Gila Topminnow repatriation sites. Program staff also entered and analyzed data and drafted reports. Program staff wrote reports for four topminnow stocking projects that were completed in 2013 (Pearson et al 2013a, b, d, and e).

New stockings. Gila Topminnow were stocked into six new locations during the reporting period. On March 28, 2013 Program and the Department's Nongame Native Fish Program staff stocked 494 Gila Topminnow (Sharp Spring lineage) into Pasture 2 Tank on the San Rafael Cattle Company Ranch; no fish died during the transport. The Gila Topminnow were acquired from Swimming Pool Tank at Robbins Butte Wildlife Area. During the summer of 2013, the rancher reported seeing topminnow in the pond.

On May 6-7, 2013, Program and BLM staff stocked Gila Topminnow and Desert Pupfish into several ponds on Las Cienegas National Conservation Area and one pond in the San Pedro Riparian National Conservation Area. Gila Topminnow were acquired from Cienega Creek near the confluence of Gardner Canyon. Desert Pupfish were acquired from Cottonwood Tank at Robbins Butte Wildlife Area near Buckeye, International Wildlife Museum in Tucson, Nursery Tank in McDowell Mountain Regional Park in Fountain Hills, and the Mandarin Pond and Arizona Trails Pond at the Phoenix Zoo. On May 6, 895 Desert Pupfish were stocked into Little Joe Spring on the San Pedro Riparian National Conservation Area; two additional pupfish died during transport. Also on May 6, 199 Desert Pupfish were stocked into Cieneguita Wetland Pond #4; there were no fish mortalities during the process. On May 7, 751 Gila Topminnow were stocked into Cieneguita Wetland Pond #1; an additional seven died during transportation. Also on May 7, 674 Gila Topminnow were stocked into Springwater Wetland; an additional 7 died during transport.

On July 15-16, Program and BLM staff stocked Gila Topminnow and Desert Pupfish into several more ponds within Las Cienegas National Conservation Area. Gila Topminnow were acquired from Cienega Creek near the confluence with Gardner Canyon. Desert Pupfish were acquired from Deer Valley High School in Glendale, Desert Botanical Garden in Phoenix, Twin Tanks at Robbins Butte Wildlife Area near Buckeye, Spur Cross Conservation Area in Cave Creek, Nursery Tank in McDowell Mountain Regional Park in Fountain Hills, International Wildlife Museum in Tucson, and The Nature Conservancy's Lower San Pedro River Preserve near Dudleyville. On July 15, Desert Pupfish were stocked: 290 into Cieneguita Wetland Pond #3, 250 into Cinco Canyon Tank, 269 into Cottonwood Tank, and 299 into Empire Tank. There were no pupfish mortalities. On July 16 Gila Topminnow were stocked: 240 into Cieneguita Wetland Pond #3 and 313 into Empire Tank. There were 12 topminnow mortalities.

One new site on USFS land was stocked in 2013. On July 22, 407 Gila Topminnow were stocked into Rock Spring near Sunflower; an additional four topminnow died during transport. The topminnow were Santa Cruz River lineage and were obtained from the Phoenix Zoo. Rock Spring was monitored on October 29, 2013. Fifteen topminnow and 34 Longfin Dace were captured in 28 dip net sweeps. Six of the topminnow were < 20 mm TL, possibly indicating that the fish had reproduced since they were stocked.

Augmentation stockings. Gila Topminnow were augmented in four locations during the reporting period. On May 20, 228 Gila Topminnow were stocked into Buckhorn Spring west of Lake Pleasant; an additional six died during transport. The topminnow were Sharp Spring lineage and were collected from Swimming Pool Tank at Robbins Butte Wildlife Area. Before stocking, topminnow were observed in the spring.

Four hundred eighty-five Gila Topminnow were stocked into three pools downstream of Nogales Spring on August 21. An additional 159 topminnow died during the translocation, possibly as a result of the long holding period (were collected on Aug 20) and then intense sloshing in the cooler while driving on the very rough road to the site. The topminnow were acquired from Cienega Creek near the confluence with Gardner Canyon on August 20, but were not stocked that day because the crew was directed not to attempt to drive the road up the wash that day because of an intense rainstorm.

On September 5, 2013 Program and BLM staff stocked Gila Topminnow and Desert Pupfish into two locations within the San Pedro Riparian National Conservation Area. The topminnow were Cottonwood Spring lineage and were acquired from BPNFCF. The Desert Pupfish were acquired from TNC's Lower San Pedro River Preserve. Three hundred eighty-nine Gila Topminnow and 324 Desert Pupfish were stocked into Horse Thief Draw; an additional six Desert Pupfish died during the translocation. Three hundred eighty-three Gila Topminnow and 712 Desert Pupfish were stocked into Murray Spring. An additional 17 topminnow and 13 Desert Pupfish died during the translocation.

Post-stocking monitoring. Several sites previously stocked were monitored during the reporting period. All of the sites that were augmented were monitored earlier in the year, except for Buckhorn Spring which was monitored during 2012, and again in the autumn of 2013. When minnow traps (collapsible Promar® or metal cylindrical) were used for monitoring, they were baited with dry dog food (Gravy Train) and set for at least two hours.

Three sites on the San Pedro Riparian National Conservation Area were monitored on July 9, 2013. At Ben Spring, Program staff set seven minnow traps and made six dip net sweeps. No fish were captured or observed. The water level was fairly low. There are three small pools, none of which was more than 18 inches deep, and combined it is unlikely that this site could support a topminnow population of 500 overwintering adults. Program staff recommend that this site be abandoned and not be stocked anymore with Gila Topminnow.

At Horse Thief Draw, Program staff set 10 minnow traps and did not capture any fish. They also completed 10 dip net sweeps and captured two small (<20 mm TL) Desert Pupfish in one of the sweeps. They also observed about eight Desert Pupfish, about half of which were > 20 mm TL in the same vicinity where the two small ones were captured; these were towards the downstream end of the perennial water where the substrate is mostly white clay. The two larger pools upstream, where Gila Topminnow and Desert Pupfish were stocked, still look like good habitat. There was no evidence of flooding, but the lower big pool had head-cut maybe two meters. Program staff recommended that this site be augmented, which was completed and is described above.

At Murray Spring, Program and BLM staff set 23 traps and collected one Desert Pupfish (>20 mm TL) near the upstream stocking site. They also conducted three seine hauls in the pool below the waterfall at the pipeline crossing and collected one <20 mm TL pupfish, 23 Western mosquitofish, 166 Longfin Dace, one Desert Sucker, and three crayfish. Green Sunfish were observed but not captured in the pool. Fifty juvenile Longfin Dace and the one juvenile Desert Pupfish were moved to a pool immediately above the waterfall. Water levels were down, and cattails and rushes were very thick, but there still appeared to be a number of pools suitable for Desert Pupfish and Gila Topminnow. Program staff recommended an augmentation stocking, which was completed and is described above.

Three sites on Las Cienegas National Conservation Area were monitored during the performance period; the sites that were stocked in 2013 were not monitored later in the year because of an unexpected shortage of staff. At Little Nogales Spring, Program staff set eight minnow traps (four in the upper stocking pool and four in the lower stocking pool), and did not capture any fish. There was evidence of a flood: debris was observed about eight feet above water level, and the upper stocking pool was scoured out and about three times longer and deeper than when it was stocked. Program staff recommend that this site not be stocked with any more Gila Topminnow, but other native species like Longfin Dace should be considered.

At Nogales Spring, Program staff set eight traps and did not capture any fish or observe any. They also walked up to where the actual Nogales Spring is supposed to be according to the topo map but it was dry. Then walked down the water course to the stocking site; water started from a 0.46 m hole in the limestone about 40 m upstream of our stocking site. They also walked downstream to the large amphitheater-like area where there are 9-12 m cliffs on the upstream and two lateral sides. There were five pools between the stocking site and amphitheater. The last pool looked great for topminnow, because it had about 30% canopy cover and was about 2 m deep. The third pool also looked good for topminnow, but it had about 75% cover and was about 0.75 m deep. Water flowed between all of these pools and there were several places with cascades that likely oxygenated the water and allowed the CO_2 to de-gas. There was no evidence of flooding, and the Nogales watershed is about half the size of the Little Nogales watershed. Program staff recommended that the lower three pools be stocked; the augmentation was described above.

At Road Canyon Tank, BLM staff set 10 collapsible minnow traps in the western pond. Program and BLM staff pulled the nets and captured 96 Desert Pupfish and 1,116 Gila Topminnow. Hundreds of pupfish and thousands of topminnow were observed. Of the captured fish, two (2%) of the Desert Pupfish and 474 (42%) of the Gila Topminnow were <20 mm TL. Therefore, both species are persisting and reproducing in the tank. The water level in the tank was low, but sedges were present all around the bank, and the aquatic habitat still looked good for the fish. Program and BLM staff also set three traps in the eastern pond, but only for about 20 minutes. No fish were captured, nor were any observed, but lots of leopard frog tadpoles were observed.

Buckhorn Spring was monitored on October 7, 2013. Twelve traps were set, and 3,326 topminnow were captured, 895 (26.9%) of which were <20mm TL. The topminnow had obviously reproduced, and increased in numbers (only 228 were stocked in May 2013, and 1,415 in November 2011). Program staff think that topminnow should overwinter and establish a population, which should persist barring total drying of the system.

Walnut Spring (site #392) was monitored on July 24, 2013. Program, the Department's regional, and USFS staff set eight collapsible minnow traps and captured four Gila Topminnow, all of which were >20 mm TL. About 10 topminnow were also observed in the pond before traps were set. Also captured were 200 red swamp crayfish, *Procambarus clarki*. Staff would have set more traps, but access to the water was extremely limited by excessive terrestrial vegetation (blackberry bramble) around the entire shore, and excessive aquatic vegetation (cattails). Program staff recommend that the blackberry bushes be culled and the cattails be controlled annually.

Volunteers for the USFS, and later Department crayfish workshops, spent considerable amount of effort trying to mechanically remove the crayfish, but the efforts were unsuccessful. Consideration should be given to using chemicals (natural Pyrethrum or its derivatives; e.g., the pharmaceutical BETAMAX VET®, which contains the active ingredient cypermethrin) to eradicate crayfish from this spring. The spring is isolated, so is seems unlikely that crayfish would reinvade on their own; there are no other known populations nearby, and Walnut Creek downstream of the spring is ephemeral.

Obstacles: Coconino National Forest decided to complete NEPA paperwork for ongoing activities around Sheepshead Spring, so stocking of topminnow into that site was postponed until the paperwork is completed and approved.

Comments: During the next reporting period we hope to stock Gila Topminnow into at least two new sites: Sheepshead Spring in Coconino National Forest and Sabino Canyon in Coronado National Forest. The NEPA compliance and Departmental EAC are completed for the Sabino Canyon project. The Coconino National Forest has drafted the NEPA paperwork for ongoing activities around Sheepshead Spring, and once that is complete, Program staff will stock. The site will be visited again before stocking to ensure that water persists, because January was unusually dry (least amount of precipitation in 30 years) in Northern Arizona.

Arnett Creek repatriations (Task 3-41 and 3-75d).

Description: Arnett Creek and its tributary Telegraph Canyon are on the Tonto National Forest in Pinal County near Superior, Arizona. Arnett Creek has been the subject of efforts to make it suitable for repatriation of native fishes since the 1990's when a barrier and chemical renovation were proposed. An Environmental Assessment was developed which outlined five alternatives, and the four action alternatives identified repatriations of different combinations of native fish species (Longfin Dace, Desert Sucker, Gila Chub and Gila Topminnow). Alternative C was selected which specified that only Longfin Dace and Desert Sucker would originally be stocked, but the site would be evaluated within nine years of implementation to determine if the habitat could support Gila Topminnow and Gila Chub. A barrier was constructed by the Forest Service, using Reclamation and other funds, and was improved to remedy some design weaknesses. The system was renovated in 1996 and again in 1997 to remove nonnative fish. In February of 1999, 23 Longfin Dace, 13 Desert Sucker, and 1 Sonora Sucker from the Gila River were stocked into the creek above the barrier. These fish did not establish, likely because too few were stocked, and they were stocked into what turned out to be an ephemeral reach. During the drought of the mid 1990s thru mid-2000s, much of the system dried leaving only about 100 m of wetted habitat in each stream. Therefore it was determined that there was not enough habitat for Desert Sucker, so the decision was made to not attempt further stocking of this species. Also, the habitat in Telegraph Canyon and Arnett Creek was re-evaluated by Department and Forest Service staff in 2007 and deemed suitable only for Longfin Dace and Gila Topminnow. The Department was to obtain stocks of the species and transport and stock those fish into Arnett Creek. Choice of lineage of Gila Topminnow will be based on the draft revised recovery plan (Weedman 1999) and those of other species will be based on any existing genetic information or on use of stocks from the closest population to Arnett Creek.

Status: Ongoing.

Expenditures: Approximately $1,970.

Preliminary Results: Some sporadic coordination with the Tonto National Forest Service Fish Biologist to assess the status of the Forest's section 7 consultation with USFWS.

Obstacles: Tonto National Forest has other priorities for its staff.

Comments: Andre Silva, the Tonto National Forest fish biologist resigned in June 2013 to take an out-of-state position. It is unknown if any progress has been made on the section 7 consultation regarding ongoing activities in the grazing allotment.

As mentioned in the last report, there is another short section of perennial water in Arnett Creek, about 8 km upstream of where Longfin Dace were stocked and just upstream of a section of private property near Highway 177. This upper section apparently has never been surveyed, so it probably should be surveyed before topminnow are stocked. There is also an ephemeral pond at the southeastern edge of the Perlite Mine that may need to

be surveyed, although fish were not observed along the shore during several previous visits to Arnett Creek.

Redrock Canyon/Sonoita Creek renovation and repatriations (Task 4-70a, and 3-40, 3-75c).

Description: Redrock Canyon is a tributary to Harshaw Creek, tributary to Sonoita Creek east of Patagonia, Arizona. Redrock Canyon and tributaries support or supported an important wild population of Gila Topminnow. Other native fishes recorded from the drainage include Desert Sucker, Longfin Dace, and Speckled Dace. By 2005 Desert Sucker and Longfin Dace were extirpated from Redrock Canyon above the natural waterfall about two-thirds of the way from the top of the watershed to the confluence of Redrock Canyon with Sonoita Creek. Speckled Dace were only recorded from Redrock Canyon once, in 2001, and have not been recorded since. During the past two decades there have been significant efforts in Redrock Canyon to minimize adverse impacts to Gila Topminnow and to increase the distribution and size of its population. Future efforts will attempt to restore Gila Topminnow and other native fish species previously found in Redrock Canyon.

Nonnative western mosquitofish invaded the system in the late 20th century, and this nonnative fish in combination with drought has resulted in the near elimination of Gila Topminnow (Duncan and Garfin 2006). Several other nonnative species have been recorded in Redrock Canyon, including Largemouth Bass and Bluegill *Lepomis macrochirus*, but have been eliminated by drought and failure of an upstream stock tank dam. By eliminating western mosquitofish from the drainage, nearly 22 km of drainage suitable for Gila Topminnow in the Redrock Canyon drainage can be reclaimed for the native fishes, and possibly Gila Chub, which was likely an historical component of the assemblage.

A lengthy dry segment in the lower end of Redrock and Harshaw canyons prevents upstream movement of nonnative species during most times. A fish barrier was planned to further prevent upstream invasion, but was eventually not supported by state and federal partners because of local opposition to it and a chemical renovation. As a result a barrier location was sought and found on Sonoita Creek, which was supported by the Department. If a Sonoita Creek barrier was constructed, nonnative fish located upstream would have to be eradicated.

Funds were provided to the Department to complete environmental compliance and other necessary actions to eradicate western mosquitofish and other nonnative fish from Redrock Canyon or if a Sonoita Creek barrier is constructed, to eradicate nonnative fish upstream of the barrier. After eradication of nonnative fish, native fish would be stocked. Replicates of the Redrock Canyon lineage of Gila Topminnow are available to provide stock for reestablishment of the population. The Department was to obtain stock of Desert Sucker, Longfin Dace, and possibly Speckled Dace from lower Redrock Canyon or Sonoita Creek, and possibly Gila Chub from Sheehy Spring and transport and stock those fish into appropriate areas of Redrock Canyon.

Status: Ongoing.

Expenditures: None

Preliminary Results: No work completed on this project during the reporting period.

Obstacles: Expressed public concerns about piscicide use and public health.

Comments: The Department's Region V Fisheries Program Manager still thinks that a renovation of Redrock Canyon is possible in the future, plus still thinks that construction of a fish barrier on Sonoita Creek would be a worthwhile conservation action. However, the Region has no plans for either action in the immediate future.

Repatriation of native fishes to Morgan City Wash and Chalky Spring (Task 3-84a).

Description: Morgan City Wash is a tributary to the Agua Fria River just downstream of New Waddell Dam (Lake Pleasant), and Chalky Spring is a tributary to Morgan City Wash about 4.2 km upstream of the confluence with the Agua Fria River. Approximately 600 m upstream of the Morgan City Wash confluence with the Agua Fria River is a meter-high weir that has prevented nonnative fishes from moving upstream; only Longfin Dace is found above the weir. Instream habitat in Morgan City Wash is thought suitable for repatriation of Gila Chub, Desert Pupfish, Gila Topminnow, and possibly Loach Minnow and Spikedace (Robinson and Carter 2007). Chalky Spring has habitat suitable for Gila Topminnow. Repatriation of native fishes was identified in Phase 1, Task #7, of an April 2003 Riparian Habitat Restoration Plan for portions of Lake Pleasant Regional Park. Morgan City Wash was also recommended for stocking of Gila Topminnow by Voeltz and Bettaso (2003). Choice of stocks will be based on recovery plans, current genetic information, or nearest geographic neighbor criteria. The Department was to complete their internal environmental compliance checklist, acquire suitable stocks to serve as sources for the repatriations, and stock listed native fishes to both Morgan City Wash and Chalky Spring.

USFWS personnel visited Morgan City Wash in February 2008 and determined that not enough habitat was available upstream of the weir for Gila Chub. Therefore, Gila Chub were removed from the list of species to stock upstream of the weir.

Status: Completed.

Expenditures: $9,852.

Preliminary Results: Program staff analyzed data and wrote the completion report for this project (Pearson et al. 2013c).

Obstacles: None at this time.

Comments: Gila Topminnow are established in Chalky Spring and in Morgan City Wash, and barring any unforeseen environmental events should persist. These populations can therefore count towards recovery. It does not appear that Desert Pupfish

established a population in Morgan City Wash, and future stockings are not recommended. Because Gila Topminnow were successfully established in Morgan City Wash and Chalky Spring, this project is considered completed and can be removed from the Department's list of projects.

Turkey Creek and O'Donnell Creek repatriations (Task 3-60).

Description: Turkey Creek, tributary to O'Donnell Canyon (Babocomari River drainage) in southeastern Arizona, represents historical habitat for Longfin Dace (last found in 1993), Gila Chub (last encountered in 1991), and likely Sonora Sucker and Desert Sucker. The dace and suckers are declining range-wide but are still relatively widespread and common, while Gila Chub has been listed as an endangered species. However, during 1990's through 2006 a severe drought occurred, and Turkey Creek may have periodically gone dry. No fish were captured in 2002, and the stream was considered fishless. O'Donnell Creek upstream from the Turkey Creek confluence was renovated in 2002 to remove Green Sunfish and restore its population of Gila Chub. The O'Donnell Creek population of Gila Chub could be replicated in Turkey Creek. This opportunity was especially attractive because non-native fishes were considered absent from Turkey Creek and a native fish assemblage thus could be restored without threats of alien fishes. Attributes that help reduce the chance of reinvasions by non-natives include relative isolation from O'Donnell Creek and Babocomari River by many kilometers of normally dry streambed. Tasks for the Department were to survey to confirm fishless status, evaluate for the potential emplacement of a fish barrier, complete environmental compliance, and then capture appropriate numbers of Gila Chub from O'Donnell Creek and translocate them to Turkey Creek. It also was recommended that Longfin Dace, Sonora Sucker, and Desert Sucker from suitable source populations be repatriated to the stream.

Several additions to the planned tasks occurred. After the repatriations of Longfin Dace and Gila Chub in 2006, nonnative fish were found in Turkey Creek and Gila Chub did not establish, but only nine were stocked. Therefore a renovation and constructed fish barrier were deemed necessary to secure the stream for native fishes. The Department will communicate with all private landowners in Turkey Creek drainage and attempt to acquire permission to eradicate (likely via chemical renovation) nonnative fishes in all tanks and perennial stream sections. If landowners are agreeable to a renovation and if a barrier is constructed, then the Department will renovate the tanks and stream, before repatriating native fishes.

Status: Terminated.

Expenditures: None.

Preliminary Results: No work was completed on this project during the reporting period.

Obstacles: The owner of Canelo Springs Ranch never replied whether he would allow us to remove nonnative fish from the pond on his land. Therefore, the Department will be

unable to remove nonnative fish from the drainage above the proposed stocking site in Turkey Creek.

Comments: Reclamation proposes to repair one of the existing erosion control structures that function as a fish barrier in O'Donnell Creek. If NEPA compliance is completed and the structure repaired, then the Department will consider augmenting the Gila Topminnow upstream, and possibly the Gila Chub upstream. However, if augmentations are considered necessary, then that project will need to be described and approved by the CAP Technical and Policy Committees so that the project can be added to the Department's list.

Spring Creek (Tonto Creek drainage) renovation and repatriations.

Description: Spring Creek is a 27.1 km tributary of Tonto Creek that begins at the confluence of Dinner Creek and Sevenmile Canyon southwest of Young, AZ. Perennial tributary and sub-tributary streams within the Spring Creek drainage include Rock, Turkey, Buzzard Roost, Walnut, and Dinner creeks. A variety of fish species have been identified during fish surveys within the Spring Creek drainage including native Headwater Chub *Gila nigra*, Desert Sucker, and Speckled Dace, and non-native Fathead Minnow, Western Mosquitofish, Yellow Bullhead, Green Sunfish, Rainbow Trout, and Brown Trout *Salmo trutta*. The Department and Reclamation personnel visited the stream in 2007 and considered the physical habitat suitable for Spikedace and Loach Minnow. Spikedace historically occurred in the Tonto Creek drainage, and Tonto Creek was included in the first critical habitat designation for Spikedace in 2000. Reclamation subsequently investigated barrier sites in Rock and Spring Creeks, and selected one in Spring Creek as the preferred location.

After a barrier is constructed, the Department was to salvage native fish species, eradicate nonnative fishes upstream of the barrier, and restock the native species. In addition, Spikedace and possibly Loach Minnow and a native trout (Apache or Gila) would be stocked to provide continuing fishing opportunity for the local community (Young and Spring Valley). After stocking the fish would be monitored annually to evaluate if they successfully established populations. Augmentation stockings would occur as necessary. The preferred lineage of Loach Minnow to stock would be the East Fork White River lineage, but if that was unavailable the East Fork Black River lineage could be used if it was available. If neither were available, another lineage agreed upon by the recovery team would be used. The preferred lineage for Spikedace would be the Aravaipa Creek lineage, as the Verde River lineage may be extirpated.

Status: Postponed until further notice.

Expenditures: None.

Preliminary Results: No work was completed on this task by CAP-funded personnel during the reporting period.

Obstacles: Local public support for the project. The Department has a higher priority renovation project in the area (Haigler Creek) so the Spring Creek project will get postponed until after the Haigler Creek project is implemented, and until after mechanical control is attempted.

Comments: This project should either be removed from the list, or if kept on, it must be recognized that no work will be completed for several years. The Department's Region VI Fisheries program staff are going to try mechanical removal of nonnative fishes for a couple of years, and then assess if the removal efforts are benefiting native fish. The Department's Region VI Fisheries program is doing the removal efforts under the CAMP. Therefore, the BOR barrier construction will also be postponed until after the Region VI assessment.

Repatriate Gila Chub to Mineral Creek (Task 3-78a).

Description: Until very recently, Mineral Creek supported a population of Gila Chub and Longfin Dace. Devils Canyon, its tributary, also supported Longfin Dace immediately upstream from the confluence of the two streams. Gila Chub were first detected in Mineral Creek in 1993, and the last time they were detected was 2000. No fish were detected in the upper portion of the stream (upstream of Box Dam reservoir) during two surveys in 2002 and one in 2006. The reasons for the disappearance of the fish are undetermined. The Department was tasked to complete its internal EAC, acquire suitable stocks to serve as sources for the repatriations, and stock Gila Chub and Longfin Dace to Mineral Creek. In addition, opportunity for repatriation of additional native species such as Loach Minnow, Gila Topminnow, Desert Pupfish, Spikedace, Desert Sucker, Sonora Sucker, and Speckled Dace should be pursued as appropriate. All sources of stock should adhere to the "closest geographic neighbor" criterion whenever possible.

The entire drainage above Big Box Dam reservoir could be managed as a native fishery, or certain portions of the drainage could be managed for native fish. If the entire drainage is targeted for native fish management, then Big Box Dam reservoir, Devils Canyon, and the portion of Mineral Creek inhabited by Green Sunfish would need to be renovated. A step-wise approach could also be taken. A first and probably easiest step would be to re-establish Gila Chub into upper Mineral Creek, as no renovation would be required because a series of small waterfalls currently limit the upstream movement of Green Sunfish and Fathead Minnow, and only Longfin Dace are found upstream of the waterfalls.

Status: Ongoing.

Expenditures: $9,852.

Preliminary Results: Program staff completed surveying the remaining tanks in the drainage (see Miscellaneous Stock Tank Surveys; Task 4-51), and completed a fish and habitat survey of upper Mineral Creek during May 28-29, 2013. Program staff surveyed the 6.1 km reach from Big Box Dam reservoir upstream to about 130 m downstream of the Government Springs Ranch property line. The streambed was dry for the first 1.3 km

upstream of Big Box Dam reservoir; the small waterfalls and putative Green Sunfish barriers mentioned in Robinson (2008) were within this dry reach. Program staff electroshocked six 100-m segments within a 2.85 km subreach whose downstream end was the start of the perennial water, and captured 2,276 Longfin Dace. Eleven collapsible minnow traps were also set within the upper 1 km of the surveyed reach. The nets were set in the morning, pulled 7 to 9 hours later, and captured 1,176 Longfin Dace. No other fish species were captured or observed, but Lowland Leopard Frog tadpoles were observed.

Program staff mapped out 302 meso-habitat units within the 6.1 km surveyed. Of the 302 units, there were 113 pools, 88 runs, 78 riffles, 18 cascades and 5 dry sections. About 52 m of the surveyed length was dry; the rest was 43% pool, 25% run, 27% riffle, and 5% cascade.

Program staff coordinated with the Government Spring landowner, Arizona State Land Department, USFWS, and US Forest Service regarding augmentation of Gila Chub into upper Mineral Creek.

Obstacles: Potentially the support of all stakeholders, primarily the Government Springs Ranch owner and Arizona State Land Department. Acquiring Gila Chub from Blue River (San Carlos River basin) on the San Carlos Apache Indian Reservation, which is the preferred nearest geographic neighbor for the repatriation.

Comments: Program staff asked USFWS to write a letter to landowners regarding the status of Gila Chub. The USFWS wrote a letter stating that Gila Chub were still considered extant in Mineral Creek, and therefore if Gila Chub are stocked into the stream it would be an augmentation and nothing would change in regard to landowner ESA compliance. The letter seems to have satisfied the Government Spring Ranch Manager and the State Land Department. Based on the 2013 habitat survey, Program staff thinks there is sufficient habitat for Gila Chub. The plan is to complete the Department's EAC and stock the appropriate lineage of Gila Chub during 2014. If Gila Chub establish (will take several years to determine) and become dispersed throughout the perennial section, then consideration should be given to repatriation of Loach Minnow, and possibly Spikedace.

Native fish repatriations into Blue River (Task 3-42 and 3-75e).

Description: The Blue River drainage in Arizona and New Mexico currently supports Loach Minnow, Speckled Dace, Longfin Dace, Desert Sucker, and Sonora Sucker. The connectedness, size, and complexity of the system suggests that other species such as Spikedace, Gila Chub, roundtail chub *Gila robusta*, Gila Trout, Razorback Sucker, Flannelmouth Sucker *Catostomus latipinnis*, Gila Topminnow, and Colorado pikeminnow *Ptychocheilus lucius* also possibly occurred in Blue River but were extirpated by the same factors that eliminated them from many other habitats in the Gila River basin. Threats to the continued existence of these species have not been alleviated, and with the possible exception of Gila Trout, reductions in abundance and range continue. Repatriation of fish to suitable habitat is among alternatives available for

management of imperiled native fishes. Several fish barriers are planned for the drainage that will assist these efforts. Wild fish from nearby sites are available to support such stockings, which are a high priority for species recovery.

The objective of this task was to repatriate roundtail chub and Spikedace into the Blue River. These activities involve coordination and communication with partners (USFWS, NMDGF, and ASNF), determination of numbers to be stocked, identification of source populations, transporting to the stocking sites, stocking fish, and reporting. Source populations should be nearest neighbors to Blue River or hatchery stock, and number of individuals removed should not obviously deplete the source. Multiple stockings should be performed at annual or shorter intervals at least three times, or until the desired populations are established, with subsequent augmentations for genetics management. Populations will be monitored for at least three years following the last stocking event to evaluate if the species have established populations.

Status: ongoing.

Expenditures: Approximately $78,817.

Preliminary Results: Program staff completed the 2012 annual monitoring of the lower Blue River during November 5-7, 2012. Twenty-four hoop nets were set and 42 roundtail chub, 1 Desert Sucker, 2 Sonora Sucker, 2 Speckled Dace, 196 Fathead Minnow, 1 Red Shiner, and 77 Green Sunfish were captured. Roundtail chub were captured in the reach between Cienega Creek and Mud Spring and in the reach between Fritz Canyon and Fritz Ranch. Green Sunfish were captured in all five reaches surveyed from Pat Mesa to Fritz Ranch. Twelve 200-m transects were also backpack electrofished, from which 16 Spikedace, 3 Loach Minnow, 17 Speckled Dace, 233 Longfin Dace, 1 Desert Sucker, 6 Sonora Sucker, 214 Fathead Minnow, 6 Red Shiner, and 29 Green Sunfish were captured. Spikedace were captured in all five reaches surveyed, whereas Green Sunfish were only captured in the three between Pat Mesa and Juan Miller Crossing.

Program staff analyzed data and drafted a report summarizing activities during 2012 (Robinson et al. 2013b). Program staff also coordinated with US Forest Service, USFWS, Reclamation, and the Department's Region 1 regarding Green Sunfish in the Blue River drainage.

Program staff surveyed the Blue River drainage downstream of The Box (furthest downstream crossing of FR281) during April, June, and October 2013 to document the furthest downstream waterfall in each tributary, and thus determine the maximum possible extent of any Green Sunfish eradication project. The Blue River from The Box down to the constructed fish barrier is 52 km long. There is an additional 59 km of stream in the tributaries below the documented waterfalls. Therefore the maximum scope of any Green Sunfish control project would be 111 km (69 miles) of stream. During April 1-3 and 15-18 tributary waterfalls inventory, Promar mini-hoop nets (cylindrical) were set, five above The Box up to Grant Creek, and 76 downstream of The Box to Fritz

Ranch to document the distribution of Green Sunfish in that reach. No Green Sunfish were captured in any of the traps. Very few fish were captured (only in 12 of the traps), and included 1 Sonora Sucker, 13 Desert Suckers, 3 Speckled Dace, 15 Longfin Dace, and 5 Fathead Minnow.

During June 24-26, 2013, Program staff conducted the annual piscivore mechanical removal from the Blue River between Fritz Ranch and the constructed barrier. All 104 pools over 1-m in depth were snorkeled through, and piscivores, when spotted, were speared. Three Channel Catfish were detected and removed. Many Green Sunfish were detected but only six were removed, because they were not the target species. Based on the number of Channel Catfish removed relative to previous years (70 in 2009, and 7 in 2012), eradication of this species may be possible.

During October 12-14, Program, the Department's Nongame Branch staff, and volunteers conducted the annual post-stocking monitoring for Spikedace and roundtail chub. Program staff electrofished 12 sites, and set 24 hoop nets (baited with dry Gravy Train dog food, and set overnight) throughout reaches 2 thru 6. Captured fish included 6 Spikedace, 3 roundtail chub, 2 Loach Minnow, 20 Speckled Dace, 260 Longfin Dace, 20 Desert Sucker, 94 Sonora Sucker, 24 Fathead Minnow, 2 Red Shiner, 6 Green Sunfish, and 8 crayfish. The Green Sunfish were found in four of the five reaches surveyed. Overall catch rates of fishes was lower than 2012, but flows (estimated at 20 cfs) were higher in 2013 which affected sampling efficiency, and a 5,000 cfs flood occurred on September 14-15, 2013, which may have killed and washed fish out of the river.

A few stock tanks within the Blue River drainage were also surveyed in 2013, but are summarized below under Miscellaneous Stock Tank Surveys (Task 4-51).

Obstacles: The community of Blue, and possibly other local communities, may have concerns with and may oppose fish control efforts. The USFS does not currently support chemical control efforts. The Department has decided to not move forward into the planning process to remove Green Sunfish in the Blue River until after the Virgin River renovation and the Haigler Creek project are completed. The Department is developing a list of potential nonnative fish control project in the next 10 years, and will then prioritize projects; it is not known what priority will be given to the Blue River.

Comments: Green Sunfish appeared to expand quickly in numbers and distribution in 2012, when they were first identified, from just one captured in June in reach 1, to 106 captured throughout reaches 2 through 6 in November 2012. Fewer Green Sunfish were captured in the 2013 monitoring compared to 2012. But catch rates were likely affected by higher flows during the 2013 monitoring, and a flood that occurred during September 2013. Given their rapid increase in 2012, it seems likely that Green Sunfish will again increase rapidly in 2014. If so, they will continue to pose a threat to the existing native fish assemblage.

San Pedro Pond Stockings (Task 3-64 and 3-75j).

Description: Reclamation rehabilitated two groundwater-supplied ponds on The Nature

Conservancy's Lower San Pedro River Preserve for use as native fish and waterfowl habitat. Beginning in 2000, Reclamation used the larger pond (~1.2 ha) as a grow-out and refuge facility for Razorback Sucker. The large pond had further potential as a refuge for Gila Chub, and both ponds could be used similarly for Desert Pupfish and Gila Topminnow. The purpose of this project was to acquire and stock individuals of Gila Chub, Desert Pupfish, and Gila Topminnow into the refuge ponds. The Department was tasked with completing the necessary environmental compliance, identifying appropriate stock, acquiring, and stocking Gila Chub, Desert Pupfish, and Gila Topminnow into ponds on the Lower San Pedro River Preserve. Gila Chub were to come from extant San Pedro River basin populations, while suitable source stocks of pupfish and topminnow had not been specifically determined.

The ponds were stocked with Razorback Sucker and Desert Pupfish before the Department and USFWS cooperative agreement. Razorback Sucker were stocked into the larger, west pond by Reclamation in 2000. On May 3, 2005, Department, Reclamation, TNC, and Arizona State University personnel stocked approximately 750 Desert Pupfish (from USFWS Cibola National Wildlife Refuge Headquarters refuge pond) into the west pond. Reclamation drained and modified the ponds in 2009, before which Razorback Sucker were removed. Razorback Sucker were not returned to the ponds after they were refilled.

Status: Ongoing.

Expenditures: Approximately $5,911.

Preliminary Results: Program staff monitored the two ponds on July 2, 2013. Program staff set 14 mini hoop nets and 16 collapsible minnow traps in the west pond and captured 481 Gila Chub and 1,955 Gila Topminnow. Of 197 Gila Chub categorized to size, 125 were <50 mm TL. Gila Chub were last stocked in 2011, so the smaller individuals captured in July 2013 are evidence that the species has reproduced. In addition, only 69 were stocked in 2010, and 21 in 2011, so Gila Chub have increased in abundance in the San Pedro Pond. Of the Gila Topminnow captured, 1,207 were <20 mm TL. Gila Topminnow were stocked in 2009, and are considered established. Fifteen collapsible minnow traps were set in the eastern pond, and 483 Desert Pupfish were captured. About 54% (259) of the Desert Pupfish were < 20 mm TL. Desert Pupfish were stocked in 2009, and are considered established.

Obstacles: None.

Comments: Gila Topminnow and Desert Pupfish are established in the ponds and should persist barring any environmental catastrophe. Gila Chub also appear to be established, and will likely continue to increase in abundance for one or more years. The population will be monitored for the final time by program staff in 2014; after that regional Department or Nongame Branch, or TNC will monitor the population. Occasionally more individuals from O'Donnell Creek, IWM, or T4 Spring should be stocked to maintain genetic variability similar to the other populations.

Miscellaneous Stock Tank Surveys (Task 4-51).

Description: All stock tanks within stream systems that have been or are planned to be protected against upstream invasions of nonnative fishes by emplacement of low-head fish barriers need to be surveyed because they may be sources of nonnative fishes into the streams. It is important to eliminate this potential avenue of nonnative fish contamination and secure the drainages for native fish recovery. The Department was provided funds to locate stock tanks in these drainages, determine which tanks are perennial, and then conduct fish and amphibian surveys of the perennial tanks using appropriate gear. A report detailing all methods and results will be provided which will include the list of tanks recommended for removal of nonnative aquatic vertebrates.

Status: Ongoing.

Expenditures: Approximately $19,704.

Preliminary Results: Three tanks in the Devils Canyon drainage and three tanks in the Mineral Creek drainage were surveyed on May 28-29, 2013. Bag seines (9.14 m long x 1.22 m wide with 1.3 cm mesh) were used to sample for aquatic vertebrates. Three to four seine hauls were done across each tank, with the goal of sampling the entire surface area if possible. No fish or amphibians were captured in the three tanks surveyed in the Devils Canyon drainage, but a frog (did not capture so unable to identify) was observed at one of the tanks. Two tanks were surveyed in the Mineral Creek drainage, and no fish or amphibians were captured. A third tank was too shallow and full of aquatic vegetation to sample effectively but the water was clear and no fish or amphibians were observed.

During 2013, program staff surveyed several of the remaining tanks in the Blue River drainage that were not surveyed in 2012. Three tanks within the Blue River drainage, plus a tank, two raceways, and diversion ditch on the Joy's Hatchery were surveyed June 3-5, 2013. No fish, but Tiger Salamander *Ambystoma tigrinum* were captured in P Bar Tank, K P Tank, and Beaverhead Quad Tank 2. Rainbow Trout, Sonora Sucker, and Northern Crayfish were captured at the Joy's Hatchery. Another landowner did not give permission to sample a pond on his property near post office. Another potential tank identified in aerial survey ended up being a fallow field. Another tank on private property was behind a locked gate, and access was not attained.

Obstacles: Could not get permission to access two of the ponds on private land near the Blue River.

Comments: All of the tanks in the Mineral Creek and Devils Canyon drainage have now been surveyed. Fish were only captured in two of the tanks in the drainages, both in the Devils Canyon drainage. Western mosquitofish were captured in East Fork tank. Mosquitofish and bluegill were captured in Headquarter tank. These two tanks could be targeted for eradication efforts to eliminate them as sources of nonnative fish to the Devils Canyon drainage.

All of the tanks in the Blue River drainage have been surveyed except two, for which access was denied. Four tanks in the drainage, and the Joy's hatchery had fish. Lazy YJ Ranch tank had Longfin Dace, Sonora Sucker and Razorback Sucker or razorback-Sonora Sucker hybrids. Tanks 30 and 31 had Fathead Minnow. Mesa tank had western mosquitofish. Rainbow Trout, Sonora Sucker, and Northern Crayfish were captured at the Joy's Hatchery. Rainbow Trout are not of concern because they already inhabit the Blue River and are a sport fish there. Mosquitofish and Fathead Minnow at the three locations are not of great concern. However, if the amount of effort required is not too great, and the risk of reinvasion low, then consideration should be given to drying the three tanks to eradicate these potential sources of mosquitofish and Fathead Minnow to the Blue River.

Assess Potential Repatriation Waters (Task 3-84c).

Description: As conservation or control projects under the Department's portion of the Gila River Basin Native Fishes Conservation Program are finished, new projects must be added to implement actions that will help recover the five endangered fish species identified in the GRBNFCP Strategic Plan: Gila Topminnow, Gila Chub, Spikedace, Loach Minnow, and Razorback Sucker. The Department was provided funds to evaluate new or previously identified sites (i.e., potential Gila Topminnow repatriation sites identified in the draft recovery plan or in Voeltz and Bettaso 2003) that might be suitable for conservation and recovery efforts for the five species. The Department will coordinate with federal and state agencies and private land owners and evaluate waters if given access. If the sites are deemed suitable for conservation efforts, then project descriptions will be written if necessary and submitted to the CAP technical committee for approval. Project descriptions will not be written for projects that are only targeted at Gila Topminnow repatriations, because these will simply be added to the Gila Topminnow stocking task (3-37).

Status: Ongoing.

Expenditures: $9,852.

Preliminary Results: On March 14, 2013 program and the Department's Region VI staff surveyed aquatic habitat in Mescal Creek, tributary to the Gila River downstream of San Carlos Reservoir. The survey began at a 4.2 m tall waterfall located about 500 m upstream of the mouth, and proceeded upstream about 2,408 m to the Needle's Eye Wilderness boundary and private land boundary fence. The surveyed reach was comprised of 18% cascades, 41% riffles, 21% runs and 15% pools. Fifty pools with maximum depth >0.5 m were documented, the deepest of which was about 2.2 m. Eighty five riffles were documented, and substrate in those riffles was dominated by cobble (33%) and pebble (43%). The overall gradient of the 2,408-m reach of stream surveyed was about 4.9%; elevation at the downstream terminus was about 672 m and at the upstream terminus was about 790 m. Although the gradient was a little high, the stream was considered suitable for Loach Minnow, Spikedace, and Gila Chub. However, if Gila Chub were stocked, they should only be stocked after Spikedace and Loach Minnow are well established. Mescal Spring could also be restocked with Gila Topminnow.

Upstream of the surveyed section, there is about another 1,600 m of perennial stream on the private property. An effort should be made to develop a conservation agreement with the landowner.

Program staff met with other agency personnel on January 23, 2013 to discuss a potential native fish restoration project in Spring Creek, a tributary to Oak Creek near Sedona. Bureau of Reclamation indicated that they would take the lead on the NEPA, and program staff agreed to contact some of the landowners along the stream. Program staff attended another meeting with agency representatives on May 14, 2013. Program staff attended a field trip to the site with other agency representatives on May 24, 2013. On October 15, 2013, Program staff met with the board of the Oak Creek Valley property owners association and discussed the potential project with them, and advised them to comment on the NEPA Environmental Assessment when it came out.

Obstacles: None. A low priority task.

Comments: During the rating period we focused on existing projects or newly started Gila Topminnow projects, so did not spend much time evaluating potential new repatriation sites. The Spring Creek project can probably be considered an official project, assuming of course it can get past the NEPA stage without major objections of locals.

Bubbling Ponds O&M (Task 3-86).

Description: Bubbling Ponds Native Fish Conservation Facility development filled the need to acquire and hold samples of rare populations of Loach Minnow, Spikedace, and other native fishes of special concern for maintenance and propagation within a suitable facility. This would mitigate catastrophic losses of wild populations and provide fish for repatriation. The purpose of this task is to provide for facility costs of the new native fish facility, which has continued to expand in size, complexity, and importance. In addition to the original 12 circular raceways, multiple stream raceways and two large holding ponds have been added to better accommodate the Program's holding and propagation needs. Funding will be provided to the Department to support facility operations and for one full-time and one half-time technician to clean tanks, feed fish, propagate and maintain brood stock and progeny.

Status: Ongoing.

Expenditures: Approximately $111,953.

Preliminary Results: Bubbling Ponds Native Fish Conservation Facility (BPNFCF) staff continued to care for Spikedace, Loach Minnow, Gila Topminnow, Woundfin, and Eagle Creek Roundtail Chub. Facility staff set up outdoor tanks and raceways for the spawning of Spikedace and Loach Minnow and set up larval fish collection systems for all outdoor artificial streams used to spawn Spikedace. In conjunction with Arizona State University (ASU) researchers, staff monitored genetic diversity and adult representation to Eagle Creek Roundtail Chub offspring, and staff continued to develop new spawning

techniques for Roundtail Chub to improve number of offspring and adult contribution. Staff also continued to develop techniques for holding and spawning Spikedace and Loach Minnow indoors. Facility staff reported that on February 10, 2014 broodstock fish counts at the facility were: 558 Gila River Spikedace; 463 Aravaipa Spikedace, 277 West Fork Gila Spikedace, 379 Aravaipa Loach Minnow, 202 Blue River Loach Minnow, 78 West Fork Gila Loach Minnow, 85 Eagle Creek Roundtail Chub, 57 Little Colorado River Roundtail Chub, 237 Woundfin, 500 mixed-lineage Gila Topminnow from Stop Sign Pond at Robbins Butte Wildlife Area, and 1,000 Cottonwood Springs Gila topminnow. There are also 850 Gila River Spikedace, 1,519 Gila Forks Spikedace, and 400 Blue River Loach Minnow available for stocking. Facility staff acquired Roundtail Chub from East Clear Creek and Chevelon Creek for brood stock establishment; Loach Minnow (San Francisco lineage) from SNARRC from fire salvage; and Loach Minnow and Spikedace from Aravaipa Creek for brood stock augmentation.

Obstacles: NEPA compliance on the various projects being conducted at the facility. Cooperation of federal agencies and authorities for collection of wild fish to maintain brood populations of 500 fish per lineage. Expanding existing tank systems to increase spawning capacity and holding space for larval fish, particularly as stocking sites are limited and offspring are retained on site. Securing external funding and completing work on other contracts because the facility is not 100% funded by CAP monies.

Comments: The facility continues to maintain populations of Spikedace (Aravaipa, Gila River, and Gila Forks lineages), Loach Minnow (Aravaipa, Blue River, San Francisco, and Gila Forks lineages), Woundfin, Roundtail Chub (Eagle Creek and Little Colorado River lineages), and Gila Topminnow (Cottonwood Springs and mixed lineages).

MISCELLANEOUS ACTIONS

Transfer Gila Chub and Gila Topminnow to New Mexico

Description: Only one population of Gila Chub, and no populations of Gila Topminnow, exists in New Mexico. Stocking Gila Chub and Gila Topminnow within historical range are recovery actions. New Mexico Department of Game and Fish (NMDGF) requested the Department provide them with Gila Chub and Gila Topminnow to be stocked into several locations in New Mexico. Locations included Burro Cienega, a fishless stream that drains south out of the Big Burro Mountains into a closed basin near Lordsburg, TNC Gila River Farm near Cliff, Redrock Wildlife Area north of Lordsburg, and Mule Creek a tributary to the San Francisco River near the Arizona border. The Department agreed to provide New Mexico with Gila Chub and Gila Topminnow after completing the necessary compliance. Funding was provided to the Department to complete the necessary compliance, collect the fish, prophylactically treat them to remove parasites if necessary, and then transfer them to NMDGF.

Status: Ongoing

Expenditures: Approximately $15,763.

Preliminary Results: Program staff surveyed Harden Cienega Creek on April 23-24, 2013 to collect Gila Chub for translocation to BPNFCF, to collect fin clips from Gila Chub for genetic analysis, and to collect Speckled Dace for a fish health assessment. Program staff set 28 collapsible minnow traps and captured 164 Gila Chub, 213 Desert Sucker, 92 Sonora Sucker, and 4 Sonora Mud Turtle. Fin clips were collected from 43 of the Gila Chub. One hundred twenty-four of the Gila Chub were kept and transported to BPNFCF; all fish survived the transport. Thirty-six Speckled Dace and 15 Longfin Dace were captured by seining and were kept for the fish health assessment. Program staff also hiked above a 2-m tall waterfall to determine the extent of perennial water and presence of fish upstream. Water extended about 1,365 m upstream of the waterfall; about 138 m upstream of Prospect Canyon. Five kick seines and one regular seine haul were performed above the falls, and 23 Speckled Dace were captured; dace were captured in five of the six efforts. No larger fish were observed in any of the pools upstream of the waterfall.

In November 2013, the Gila Chub collected from Harden Cienega and then held at BPNFCF were stocked into Mule Creek, tributary to the San Francisco River near the Arizona-New Mexico border. Five Gila Chub died while being held and treated for pathogens and parasites at BPNFCF. On November 13, 2013, BPNFCF staff transported the remaining 119 Gila Chub to New Mexico. On November 14, 2013, NMDGF and Department staff transferred fish to insulated buckets, hiked six hours, and stocked the 119 Gila Chub into Mule Creek. All fish looked healthy and behaved normally upon release.

The Department's fish health specialist, on April 24, 2013, examined the collected Speckled Dace and Longfin Dace for parasites, and collected samples necessary for bacteriology and virology, the latter of which were sent to the Washington Animal Disease Diagnostic Lab. No external or internal parasites were detected, and all samples were negative for virus or bacteria of concern.

Obstacles: None at this time.

Comments: Gila Chub have now been stocked twice into Mule Creek (118 in June 2012 and 119 in November 2013). At least one more stocking of Gila Chub should be completed, with a goal of having a founder population (total number stocked across all stockings) of at least 500 individuals.

There is about a mile of perennial water above the waterfall in Harden Cienega Creek, and Gila Chub are absent from that reach. Program staff communicated with agency partners and the Gila Chub recovery team and proposed translocation of some of the chub from downstream to upstream of the waterfall to extend the range of Gila Chub in Harden Cienega Creek. Partners and the team agreed that it was a good idea, and so Program staff will complete the necessary internal compliance and hopefully will complete the translocation in 2014.

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Appendix 1. Populations of threatened and endangered species established under the Gila River Basin Native Fishes Conservation Program, as of December 31, 2013. Gila Topminnow and Desert Pupfish site numbers are given where known.

Species	Metapopulation	Lineage	Replicated Locations	Year replicated
Gila Topminnow	Bylas Spring Complex	Bylas Spring	Swamp Spring (#406; Muleshoe Ranch CMA)	2007-2008
			Cherry Spring (#405; Muleshoe Ranch CMA)	2007-2008
			Secret Spring (#331, Muleshoe Ranch CMA)	2007
			Headquarters Spring (#407; Muleshoe Ranch CMA)	2008
			Burro Cienega, NM	2008
			TNC Lower San Pedro Preserve's west pond	2006
			Howard Well (#83)	2008
	Upper Santa Cruz	Sharp Spring	Fossil Creek (#280)	2007-2010
			Morgan City Wash (#383)	2009
			Chalky Spring (#310)	2009
			Robbins Butte Wildlife Area Swimming Pool Tank	2009
			Page Springs Hatchery SRP Topminnow Pond (#158)	2009
	Monkey & Cottonwood Springs	Monkey Spring	Cottonwood Spring (#415; Goldfield Mountains)	2008
			Spur Cross Ranch Conservation Area's Solar Oasis pond (#413)	2009
	Mixed Lineage Stock	Redrock Canyon & Bylas Spring	Robbins Butte Wildlife Area Stop Sign Pond	2010
Desert Pupfish	Santa Clara/El Doctor		Howard Well (#83)	2008-2009
			Mud Spring (#18; Tonto NF Mesa Ranger District)	2007-2009
			Larry & Charlie Tank (#408; Muleshoe Ranch CMA)	2009
			Nursery Tank (#398; McDowell Mountain Regional Park)	2010
			Pemberton Pond (McDowell Mountain Regional Park)	2009
			Robbins Butte Wildlife Area Cottonwood Tank	2010
			Robbins Butte Wildlife Area Twin Tanks	2009
			Spur Cross Ranch Conservation Area's Solar Oasis pond (#413)	2009
			TNC Lower San Pedro Preserve's east pond (#390)	2009
Longfin Dace		Hassayampa River	Arnett Creek	2007
		Tangle Creek	Fossil Creek	2008-2009
		Coal Mine Canyon	Fresno Canyon	2008
Gila Chub		O'Donnell Creek	TNC Lower San Pedro Preserve's west pond	2011