Arizona / Nevada Regional Report: Spring 1997

by Peter J. Unmack

Since this is my first report, I figure a brief introduction is appropriate. I hail from Australia and have been living in the U.S. since September 1994. I am presently a Masters student at Arizona State University working on the biogeography of freshwater Australian fishes under Dr. W. L. Minckley. One of my main interests is desert fish and desert springs in particular. I try and get out in the field occasionally and have been spending some time lately in Ash Meadows, Nevada, working on exotic fish reproduction during winter, under thermal conditions. I also arrange two trips per year to southern Nevada for Tropical FishKeepers Exchange and the Bay Area Killifish Association to undertake conservation work on threatened and endangered fish populations, under the direction of Nevada Division of Wildlife biologist Jim Heinrich. The first portion of this report is the results of my latest trip, followed by brief notes on some additional collecting, and an annoncement of a conservation trip in the Fall.

March 14-16 1997 was our conservation weekend in southern Nevada. First stop was the Virgin River at Mesquite where we were monitoring reintroduced endangered woundfin (*Plagopterus argentissimus*, back cover) populations. Native fish were not very common—a few flannelmouth suckers (*Catostomus latipinnis*, back cover), desert suckers (*Catostomus latipinnis*, back cover), desert suckers (*Catostomus latipinnis*, back cover), desert suckers (*Catostomus latipinnis*, back seminuda), one speckled dace (*Rhinichthys osculus*), and around 20 woundfin. Exotics included one carp (*Cyprinus carpio*) and literally thousands of red shiners (*Cyprinella* [*Notropis*] *lutrensis*). Next day we headed to a local park for some hard labor, adding rocks to a half-mile stretch of artificial stream being developed for native fish conservation in Boulder City (Fig. 1). Thanks to Jim Heinrich for allowing us to contribute.



Fig. 1. No, he's not crushing an exotic with a rock. He's helping create an artificial stream for fish conservation in Boulder City, Nevada. Photo by Peter J. Unmack.

From there we headed to Ash Meadows for a dayand-a-half. We removed reeds (*Typha*) from two springs in an effort to open up the habitat of threatened pupfish (*Cyprinodon nevadensis mionectes*), and to reduce habitat for the exotic species (Figs. 2 and 3). We also removed around a thousand exotic fish (sailfin molly and "damnbusia"), crayfish and bullfrogs. During six months there, I have removed over 8,000 exotics in five or six trips. Pupfish numbers appear to be improving, especially juveniles. Of course, one needs to keep removing exotics for the effect to continue. All collecting was done in conjunction with United States Fish & Wildlife Service staff on the refuge. We also collected a bunch of shortfin mollies and convict "sicklids" (including albinos) from Roger's Springs, by Lake Mead.

The day after returning from that trip it was off with the ichthyology lab that I teach to Lake Mohave on the Colorado River. The primary purpose was to collect endangered razorback suckers (*Xyrauchen texanus*, front cover) as part of a larger annual sampling effort to monitor a population that has continued to decline since collecting began in the late 1960s. It's impressive to view and hold a fish that is over 40 years old. Few folks get to experience that! We also caught one bonytail chub (*Gila elegans*, back cover), probably the most endangered fish in the country. It was most likely a hatchery release (the tag number needs to be checked). Exotics were also abundant, including carp, largemouth bass, bluegill, striped bass, channel catfish and rainbow trout.

During the night, teams went out collecting larval razorback suckers as part of the recovery effort. The last time recruitment occurred in the lake was 40-50 years ago, the age of the present group of adult fish! Unfortunately, they don't live much longer than this, thus the population (and virtually the species) is almost gone. To prevent extinction, larvae are collected at night, as they are attracted to a light source. They are then taken to a hatchery and released into exotic fish-free backwaters in the lake. No larvae are ever found over a halfinch long in the main lake, due to predation by exotics. So far this year, over 75,000 larvae have been collected. Once they reach 10-12 inches (big enough to avoid exotic predators), they are released back into the lake. It is still too early to tell if this will be successful, although results to date are encouraging.

On the way up to the lake we collected in three streams in the Bill Williams drainage, a tributary to the Colorado River in Arizona. The Santa Maria River had abundant longfinned dace (*Agosia chrysogaster*), a single red shiner, and a few bluegills (*Lepomis macrochirus*). Burro Creek only contained red shiners and bluegills. Big Sandy River had only longfinned dace. All in all a busy week of activity that was great fun for all involved.

The following weekend I visited Fossil Creek in the upper Verde River near Payson. The whole creek is spring fed. Native fish were abundant, including speckled dace, desert suckers, and an enigmatic chub population (*Gila "robusta"*). Fossil Creek has one of only a few populations of this chub, which is morphologically intermediate between the roundtail chub (*Gila robusta*) and the Gila chub (*G. intermedia*); its taxonomy is yet to be resolved. It is indeed a rare treat in Arizona to be able to sit and observe an intact native fish fauna without many exotic fishes; only a few bluegills were observed. At this moderate altitude, three species is the normal diversity that would be expected to occur. (Seven species is the highest native fish diversity still found in any waterbody in Arizona. Unfortunately, it is not uncommon to find more than seven exotic fishes in many waterbodies.)

The next day I headed out to collect genetic samples for a fellow graduate student. The first destination was the upper Santa Maria River to sample Date Creek. Here the creek has perennial water (i.e., the only water present) for about three quarters of a mile as it passes through a gorgeous little canyon. Longfinned dace, adults and juveniles, were abundant. For the first time I observed their breeding pits. These consist of small, dug-out depressions in the sand. Males don't guard territories; when a female passes by, several males chase her and spawn in one of the many depressions. There is no parental care. Exotic fathead minnows (Pimephales promelas), which had been previously recorded here, were absent. In canyons, it's not uncommon for exotic fish to disappear after the first larger flood. Native fish are adapted to survive the torrential flows through the canyon; exotics, on the other hand, get washed downstream to desiccate in the desert. The Hassayampa River was the other site sampled that day. Young longfinned dace were abundant, but only a few adults were found.

The next weekend it was off into the wilds again, this time to Aravaipa Creek with students from the ichthyology class. Aravaipa is a special place in Arizona as it contains seven native species and few exotics. Dr. Minckley has been sampling Aravaipa Creek for over 35 years! This data is used to determine changes in relative species abundance over time, and to identify the origins of such changes (e.g., variations in stream discharge).

The reason that fishes exist at Aravaipa Creek is because it flows through a major canyon. Various geomorphological factors that make up a canyon force water to the surface, thus water exists perennially. The



Fig. 2. Fairbanks Spring, Ash Meadows, Nevada, before vegetation removal. Photo by Peter J. Unmack.

canyon is approximately 20 miles in length. Above and below the canyon, water is not usually present.

We split into three groups to allow the nine sites to be sampled over the weekend. The seven native species recorded include desert suckers, Sonoran suckers (Catostomus insignis), threatened spikedace (Meda fulgida), threatened loach minnow (Tiaroga cobitis), speckled dace, roundtail chub, and longfinned dace. Exotic fish collected included green sunfish (Lepomis cyanellus) and yellow bullheads (Ameiurus natalis), while additional records exist for red shiner, fatheads, largemouth bass, black bullhead (A. melas), carp, and "damnbusia." These exotics either don't survive longterm, or never get a chance to build up large populations due to the marginal habitat, or to the huge 1983 flood that wiped out most of their numbers. (Interestingly enough, the abundance of natives did not change.) However, the numbers of exotic fish in the lower portion of Aravaipa Creek has increased since the 1983 flood. This is because the creek now flows farther, allowing exotics to migrate from the San Pedro River.

Desert Springs Action Committee Ash Meadows Work Party October 10-12, 1997

The Desert Springs Action Committee in conjunction with the Bay Area Killifish Association presents their latest conservation field day and eco-tour to the Nevada desert.

During October 10-12 we will be undertaking conservation work at the Ash Meadows Wildlife Refuge under the supervision of Fish and Wildlife Service staff. Several graduate students, including myself, will be on hand to make this one of the best trips to date.

Ash Meadows, Nevada, is a special place. It has a higher number of endemic species for its given area than any other place in the United States. This is primarily due to the presence of permanent freshwater springs that allow life to flourish in the desert. Ash Meadows was also the site of one of the longest environmental battles in North America (1967-1984). For a considerable time the area was threatened by ranchers who diverted spring



Fig. 3. Fairbanks Spring, Ash Meadows, Nevada, after vegetation removal. Photo by Peter J. Unmack.

outflows and pumped excessive quantities of ground water for irrigation, threatening the continued existence of the springs. The next principal impact was a proposed desert city that would have also required large quantities of ground water. As a combined result of these impacts, one fish species is extinct, and the remainder are currently listed as endangered species by the United States Fish and Wildlife Service. Today the area is a National Wildlife Refuge. Despite its current protected status, problems still occur regularly, i.e., exotic fish species are still introduced into springs threatening native aquatic fauna.

Our primary objective is the removal of non-native organisms, including "damnbusia," largemouth bass, mollies, crayfish and bullfrogs. There will be ample opportunity to see the native pupfishes and dace close up. We may also have the chance to get a close view of the famous Devils Hole pupfish (*Cyprinodon diabolis*), which has the most restricted natural range of any vertebrate species in the world. This fish usually remains behind locked gates. Please note, however, that no native fish may be removed from the refuge as all are fully protected by the Endangered Species Act.

We will likely be granted permission to camp at the refuge headquarters; alternative accommodations are available at the nearby Longstreet Casino (1-800-508-9493). Ash Meadows is located a few miles north of the CA-NV border on Hwy. 373 and is clearly marked by a signpost. Some cooking equipment will be available, and Jim Lawson will be doing an outstanding effort as chef. Our stay out there will be similar to a pot luck, sharing items like chips, snacks, and fresh fruit. The mainstay of our foods will be provided by the Desert Springs Committee. A \$20 stipend towards the food is requested in advance and covers a two-day menu with a special barbecue Friday night. Please inform us if you intend to go so car pools can be organized, if needed.

For more information and the required registration forms, contact Jim Lawson, 802 Arlington Way, Martinez CA 94553; 71740.3177@compuserve.com; 510-335-9346. The non-refundable stipend is due Sept. 15, 1997.