

**2018 Annual Summary of Activities**  
**Pahrump Poolfish Safe Harbor Agreement**

by

**Las Vegas Valley Water District**

The following report is an annual summary of activities under Enhancement of Survival Permit # TE17874C-0 issued to the Las Vegas Valley Water District. This permit was granted under the Safe Harbor Agreement for Pahrump poolfish at the 180-acre Springs Preserve (Enrolled Property) in Clark County, Nevada.

**Executive Summary:** A total of 250 Pahrump poolfish were introduced to two ponds at the springs Preserve in May 2018. These fish began reproducing almost immediately, as the first fry were observed about 3 weeks later. By early October 2018, the population had increased to an estimated 386 fish, a 64.8% increase in population size in just over four (4) months. Subsequently, an estimated 5.7% (N = 22) of the population died as a result of a virulent attack by a Flavobacterium and secondary fungal infection. Two pathologists concurred that the mortalities were the result of a stressor that resulted in compromised immune systems. The two confounding stressors were: (1) environmental - a 7°C degree drop in water temperature (i.e., from 22°C to 15°C between the 1<sup>st</sup> and 2<sup>nd</sup> capture sessions; and (2) anthropogenic - trapping, handling, and marking during a mark-recapture survey.

#### **Habitat Creation**

In Spring 2018, a Restoration Ecologist planted native emergent aquatic plants in planter pockets within the periphery of both constructed ponds. In addition, rushes in pots were placed in both ponds to increase nutrient absorption and to increase habitat structure. This native vegetation matured throughout the 2018 growing season, enhancing the habitat quality of the fish.

#### **Establishment of Refugia**

##### **29 May 2018**

250 Pahrump poolfish introduced into ponds NF-1a and NF-1b (125 in each) at approximately 20:00 by Brandon Senger (NDOW), Thomas O'Toole (Springs Preserve), Raymond Saumure (SNWA), and Aaron Ambos (SNWA).

##### **05 June 2018**

USFWS inspection of Springs Preserve ponds by Fish Biologist James Harter.

##### **18 June 2018**

Documented the first Pahrump Poolfish fry within pond NF-1a. Fry were already about a week old.

##### **27 June 2018**

Second cohort of Pahrump poolfish detected in pond NF-1a.

## **20 September 2018**

Two (2) 10 mm Pahrump poolfish fry observed in pond during algae removal, which suggests they are 2-3 weeks old.

## **Population Survey**

### **03 October 2018**

Assisted NDOW with 1<sup>st</sup> fish mark-recapture session. Captured and tail clipped 372 Pahrump poolfish; 134 from downstream (NF-1a) pond and 238 from upstream (NF-1b) pond. That is 122 more fish than was introduced on May 31st, 2018.

### **08 October 2018**

Pahrump Poolfish recapture session conducted by NDOW. A total of 165 Pahrump poolfish were captured in the upstream (NF-1b) pond; of these, only nine (9) were unmarked. A total of only five (5) Pahrump poolfish were captured in the downstream (NF-1a) pond; of these, only one (1) was unmarked.

### **09 October 2018**

Resampled pond NF-1a because of poor recapture rate on 08-October-2018. Of the five Pahrump poolfish captured only (2) were recaptures. Fish are inactive because of water temperature drop since 3 October 2018.

### **The population estimates and 95% Confidence intervals (CI) calculated by NDOW for the two ponds were:**

Downstream Pond (NF-1a): 134 Pahrump poolfish with 95% CI of 63-310.

Upstream Pond (NF-1b): 252 Pahrump poolfish with 95% CI of 215-295.

The combined estimate for both ponds was 386 Pahrump poolfish. Thus, the mark-recapture estimates produced by NDOW revealed that the Pahrump poolfish population had increased by approximately 136 fish, a 64.8% increase in population size...in just over four (4) months!

## **Mortalities**

A total of 22 dead or dying Pahrump poolfish were collected from 8 October to 27 November 2018. This represented a loss of 5.7% of the population. All instances were reported in writing to USFWS and NDOW. Several fish were sent to two different pathology labs, including the USFWS CA-NV fish pathology lab. The consensus was an attack by a Flavobacterium and secondary fungal infection. Both organisms are common in aquatic environments and likely only become a problem when fish have a compromised immune system because of a stressor. In this case, there were two confounding stressors: (1) a 7°C degree drop in water temperature (i.e., from 22°C to 15°C between the 1<sup>st</sup> and 2<sup>nd</sup> capture sessions; and (2) trapping, handling, and marking during the mark-recapture survey.