

Devils Hole pupfish Count – Fall 2015



The FALL 2015 Devils Hole pupfish (DHP) survey for adult and smaller observable pupfish in Devils Hole was conducted on September 26th and 27th. The Incident Command Team has reviewed the results and agreed that the “official” count for fall 2015 is 131 pupfish. This estimate is the average of the “without net” counts (first count each day), which reflects the monitoring process extending back to the 1970s.

Two methods are used to count DHP on two adjacent days:

- “Without Net” is the first method used each day, and involves no block net to limit movement of pupfish between the shallow shelf and deeper portions of Devils Hole. This is the “traditional” method used for decades to count Devils Hole pupfish.
- “With Net” is the second method used each day, and involves a block net placed to prevent or limit movement of pupfish to and from the shallow shelf. This method has been used since spring 2009.

Results of the four counts of DHP, fall 2015 (second diver’s results in parentheses)

Day	Without Net	With Net
Saturday (26 th September)	153 (151)	128 (110)
Sunday (27 th September)	109 (113)	132 (120)
Arithmetic Mean	131	130

Interpretation:

1. The fall 2015 count of 131 DHP represents a 22% increase from the level observed a year earlier (107 pupfish) and double the level observed two years earlier in fall 2013, when the count was at a historic low of only 65 pupfish.
2. Historically, the fall count has been the high point for the pupfish population each year. The count this past spring was 80 pupfish.
3. Pupfish in Devils Hole in fall 2015 appear to be healthy and behaving normally.
4. The range of pupfish sizes observed in Devils Hole in fall 2015 indicates that reproduction and recruitment (survival of young fish to larger sizes) has continued during summer 2015. Fish observed were from about 8 to >25 mm in length.
5. Cover on the shallow shelf has been augmented since May 2013, consisting of several vertically oriented shrubs obtained locally and anchored to the shelf. These cover packets continue to be maintained as they support algae and other biota and are frequented by pupfish. One cover packet displaced by a seiche (standing wave) to the second shelf (about 20 feet deep) was observed to be frequented by pupfish during the fall count.
6. Supplemental feeding has been ongoing in Devils Hole since early 2007. Feeding has been adjusted over time to reduce the frequency of provision and to provide higher quality food. Feeding no longer occurs on weekends. Currently, high-quality food is provided twice per week at a rate (on each of two days) of 6% of estimated pupfish biomass

(interpolated between spring and fall counts). On other weekdays, a broadcast feeder releases larval fish food at a rate (on each of three days) of 1% of the pupfish biomass.

7. The shallow shelf continues to be dominated by cyanobacteria, although *Spirogyra* (more prevalent in earlier decades) was relatively abundant during summer 2015 compared to other recent summers.
8. Seismically-generated seiches (standing waves) have impacted Devils Hole minimally over the past two years. There have also been no major flood events since 2012.
9. Monitoring of the Devils Hole environment, cover augmentation, and supplemental feeding of the wild DHP population has continued in 2015. These management actions will continue to be reviewed regularly by the 3 management agencies (FWS, NPS, NDOW).
10. The DHP population continues to be a great concern for management, but the current count, range of pupfish sizes in the wild population, and successful recovery of viable eggs and captive propagation over the past two years represents encouraging progress.

About the Count

The “official” count is developed from several individual estimates that vary due to chance and divers’ ability to see fish within the complex habitats in Devils Hole. The “official” count represents the ICT’s consensus about what the actual number of observable pupfish likely are based on the evidence obtained. Pupfish may be overlooked or counted multiple times during any particular survey. The ICT recognizes that smaller fish are routinely undercounted, particularly juveniles and especially larvae and post-larvae, which can be almost invisible under a wide range of conditions.