

Standard Operating Procedure #15

Fish Survey

Version 1.01 (April 9, 2020)

Change History

New Version #	Revision Date	Author	Changes Made	Reasons for Change	Previous Version #
1.01	4/9/2020	David Raikow	5 pieces of cat food.	Not previously specified.	1.0

Only changes in this specific SOP will be logged here. Version numbers increase incrementally by hundredths (e.g., version 1.01, version 1.02) for minor changes. Major revisions should be designated with the next whole number (e.g., version 2.0, 3.0, 4.0). Record the previous version number, date of revision, author of the revision, changes made, and reason for the change along with the new version number.

Purpose

This SOP describes conducting a trapping survey for fish for the Pacific Island Network Anchialine Pool Monitoring Protocol.

Overview of Sampling Procedure

This procedure must be done after water quality measurements have been made and should begin at the same time as shrimp trap deployment. A maximum of six baited collapsible minnow traps (Figure SOP 15.1) are deployed. The number of traps deployed depends on the estimated surface area of the pool (Table SOP 15.1, Figure SOP 15.2). Observer(s) identify and count all fish and shrimp in the traps after a deployment time of 30 minutes.

Table SOP 15.1. Table showing number of traps to be deployed as a function of pool surface area.

Surface Area (m ²)	Survey Quadrats
0-5	2
5-10	3
10-20	4
>20	6

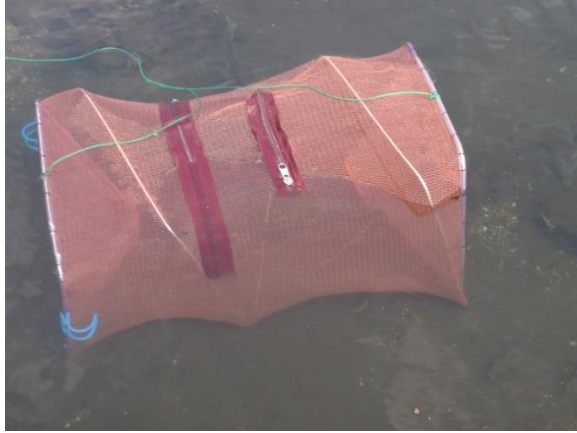


Figure SOP 15.1. Fish trap.

Conducting a Fish Survey

Up to six baited traps are distributed uniformly throughout the pool. The same cat food as used in shrimp traps is used as bait. Five pieces of cat food are placed in a bait holder in the center of the trap. After thirty minutes of deployment, traps are collected one at a time. Fish are transferred from the trap to a five-gallon bucket. At pools where visitors are present, fish are immediately placed in a bucket with the lid secured. If the fish are native, immediately record the species and return the fish to the pool. If the fish are introduced, place the fish in a collection container, label with the trap number, and put in a cooler with ice. Introduced fish will be identified in the laboratory and then sacrificed and processed according to park procedures. The observer(s) records all fish caught in each trap, noting species and sex, when possible. See species identification guide in Figure 15.2. Shrimp caught in a fish trap are placed in a sorting tray, identified and recorded (see SOP #13 Baited Trap Shrimp Survey, and Figures SOP 13.1 - 13.3). All native species are returned unharmed to the pool as quickly as possible. After the fish are properly labeled and in the cooler from one trap and the shrimp species are noted, proceed to the next trap and repeat the processes.

Introduced Species

Both native and introduced fish species caught in a trap should be recorded. Additionally, if an introduced species is seen in the pool, but is not in a trap, it should be identified and noted in a separate location on the data sheet. In general, introduced fish and shrimp should be collected, recorded on data sheet, and removed from the pool as explicitly stated in park permit. If the species is not previously known from that area it should be collected as a voucher specimen. If an introduced species cannot be identified, observers should catch the specimen for expert identification.

Anchialine Pool Introduced Fish Identification Guide



Male tilapia are often brightly colored during the breeding season.

Tilapia (male)

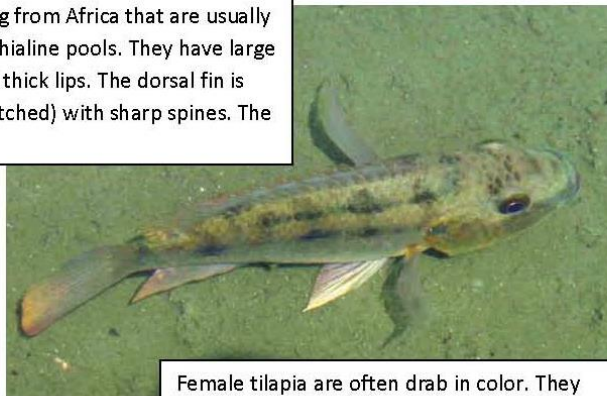
Mosquitofish have beige-colored backs, blue-gray flanks, and white bellies. Females display a dark blue-black "gravid spot" located about mid body. Just below the gravid spot and in front of the anal fin is a small yellow spot.



Gambusia affinis (mosquitofish)

Male mosquitofish are much smaller and slimmer than females (usually not larger than 2.5 cm). Males have a modified splint-like anal fin called a gonopodium. Females can grow twice as large as males up to 5 cm.

Tilapia are cichlids originating from Africa that are usually about 15 cm in length in anchialine pools. They have large mouths, very fine teeth, and thick lips. The dorsal fin is long and continuous (not notched) with sharp spines. The anal fin always has 3 spines.



Female tilapia are often drab in color. They can often be seen mouth brooding (fry take refuge in the mouth of the mother).

Tilapia (female)

The male guppy (pictured) has colorful markings on its body and fins especially the tail.



Poecilia reticulata (guppy)

The female guppy is rather drab and can often be confused with the female mosquitofish. In order to tell them apart look at the gravid spot, the clear patch of the abdominal wall located near the base of the anal fin. In guppies it is yellowish brown to brownish-black in color. In mosquitofish, it is blackish-blue with a lemon-yellow patch just below it.

Figure SOP 15.2. Anchialine pool introduced fish identification guide.