

Standard Operation Procedure (SOP) #19

Snail (akaleha) Surveys in Guam

Version 1.02 (June 3, 2024)

Change History

New Version #	Revision Date	Author	Changes Made	Reasons for Change	Previous Version #
1.01	3/19/2021	Amanda McCutcheon	Revised text to include changes made to field procedure (sampling half the reach rather than the full reach) and moved the datasheets and field guide to this SOP.	The SOP no longer reflected the field procedure. Datasheets and field guide were originally in an Appendix. We moved them to the SOPs to make them easier to revise when necessary.	1.0
1.02	6/3/2024	Kim Weisenborn	Updated datasheet.	Datasheet had been updated.	1.01

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, identify paragraphs and pages where changes are made, who approved the revision, and the reason for making the changes along with the new version number.

Purpose

This SOP describes conducting a snail survey using a sectional sampling design. This SOP will be used in Guam at WAPA. The [datasheets \(2\)](#) required for this procedure and a [field guide](#) are included below. The general procedure for setting up a site and the order of surveys at WAPA are described in [SOP #10 Conducting Surveys in Guam](#).

Overview of Procedure

Sampling moves from downstream to upstream. The five 6-m sections set up in [SOP #10 Conducting Surveys in Guam](#), will be surveyed for snails. Downstream to upstream these sections will be referred to as T1-T2, T2-T3, T3-T4, T4-T5, and T5-T6. Due to time constraints, only 3 m of stream length within each 6-m section will be surveyed in this sectional search. Sampling requires one or two observers collecting snails and another observer onshore measuring snails and recording data. The observers count egg capsules, collect snails, and count all post-larval snails (spat) that measure

less than 5 mm (Ford 1979; Hodges 1992) in each 6-m section. The onshore observer identifies and measures snails and records data.

Conducting a Survey for Snails

A random subset of three 1-m sections within each of the five 6-m sections will be completely surveyed for snails. Before arriving at the field site, one observer should randomly select which 1-m sections will be sampled and circle those on the snail egg and spat datasheet (below). Ideally two observers would be available to perform in-water counting and collecting simultaneously. One observer can search the right bank to the center of the stream and the other can search the left bank to the center of the stream in order to completely cover the stream width. The in-water observers count egg capsules found on and between rocks using mask and snorkel if necessary. Observers should also pick up smaller rocks and count egg capsules that can often be found underneath rocks. Observers tell the onshore recorder the number of egg capsules counted per 1-m section. The in-water observers also count the number of post-larval snails (any snail ≤ 5 mm – referred to as spat on the datasheet) within each section and inform the onshore data recorder. Wearing a face mask and snorkel, the observer collects all snails (visible or located between and beneath boulders) within the section and hands them to the onshore recorder to identify (Table SOP 19.1) and measure them with calipers (Figure SOP 19.1). As demonstrated in Figure SOP 19.1, shell lengths are measured to the nearest millimeter, as the longest distance between the apex (origin of whorl) and the anterior margin (Ford 1979). The observer should also record whether each snail has evidence of shell corrosion (indicated with a check mark on the datasheet). Shell corrosion is damage to the shell usually around the apex where the outer shell has been eroded away and the lighter color tissues beneath are exposed. All loose gravel, cobble, and rocks are then picked up, searched, and replaced, and additional snails found within the section are collected and measured. Snails are returned to the stream after being measured. Place the snail so that it can reattach to the substrate; you may have to hold it in place for a short time, don't just toss it back in or it may be eaten by a prawn.



Figure SOP 19.1. Measure the snail as the longest distance from the apex of the shell to the anterior margin (indicated by the yellow line).

Species Identification Guide for Guam

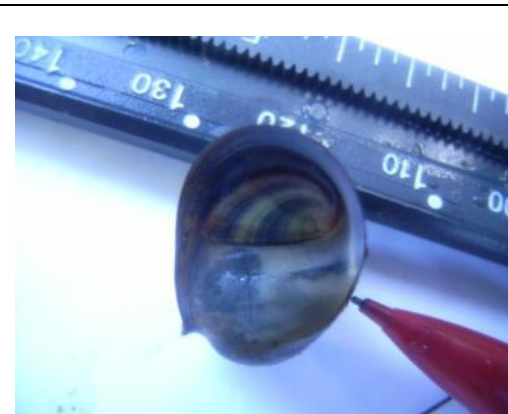
Table SOP 19.1. Guam snail identification guide.



Neritina pulligera



Vittina variegata



Neritina squamaepicta



Septaria porcellana (top)



Septaria porcellana (underside)



Nertina petiti



Snail eggs. Look like white sesame seeds.



Example of "corrosion" on snail shell.

WAPA SNAIL EGGS AND SPAT DATASHEET

Site:	Date:
Observers:	Recorded by:
Snail Notes:	

Randomly choose one meter segment from each row, then circle below:		Number of eggs	Total number of eggs	Number of spat	Previous 6m segment
0-1	1-2				T1-T2
2-3	3-4				T1-T2
4-5	5-6				T1-T2
6-7	7-8				T2-T3
8-9	9-10				T2-T3
10-11	11-12				T2-T3
12-13	13-14				T3-T4
14-15	15-16				T3-T4
16-17	17-18				T3-T4
18-19	19-20				T4-T5
20-21	21-22				T4-T5
22-23	23-24				T4-T5
24-25	25-26				T5-T6
26-27	27-28				T5-T6
28-29	29-30				T5-T6

WAPA SNAIL MEASUREMENT DATASHEET

Site:	Date:
Observers:	Measured by:
Snail Notes:	

[illegible]