

Standard Operating Procedure #17

Riparian Vegetation 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	Photo caption revised.	To make caption consistent with text.	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 how to estimate vegetation as a percent cover of anchialine pool bank vegetation for the Pacific Island Network (PACN) Anchialine Pool Monitoring Protocol.

Sampling Procedure

This survey should be conducted after animal surveys. All plant species found within 1.5 m of the high tide line around the entire pool should be listed on the data sheet. Unknown species should be photographed or collected for identification by the PACN botanist. Observers will then independently record the coverage category (<1% or “trace”, 1-25%, 25-50%, 50-75%, or 75-100%) of each species around the entire pool (i.e., coverage is not based on the vegetated area but on the entire area within 1.5m of the high tide line). Observers should review Figure SOP 17.1 for vegetation cover category examples. Observers should compare results when done and resolve any differences in coverage categories through on-site discussion and additional observations. Plant surveys should generally not take more than 30 minutes. A photographic guide to common anchialine pool vegetation is shown in Figure SOP 17.2. See Table SOP 17.1 for a list of plant species common to anchialine pools.

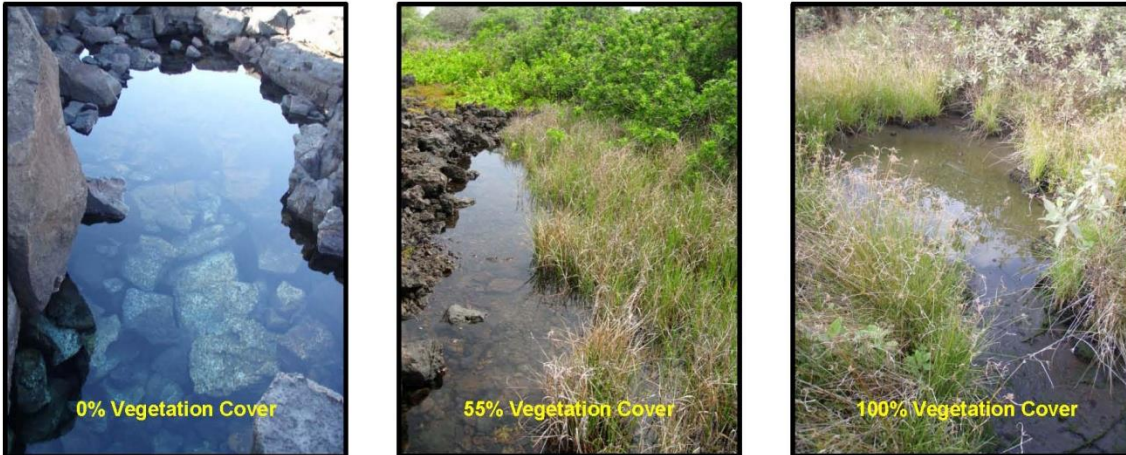


Figure SOP 17.1. General percent cover vegetation survey sampling examples; pictures from left to right would be classified as 0-25% coverage, 50-75% coverage, and 75-100% coverage, within 1.5m of the pool edge, assuming the plant species in question occurs throughout the vegetated area in picture.

Additionally, if a noteworthy species (e.g., non-native invasive or special status) is seen nearby, but is not within the 1.5m sampling area, it should be identified and noted in the “Taxa observed (not otherwise recorded)” section of the data sheet. Non-native species should be removed if possible and consistent with park guidance.



Figure SOP 17.2. Images of common anchialine pool vegetation.

Table SOP 17.1. List of common plant species known to occur around anchialine pools, modified from Pratt (1998): E = Endemic (native and unique to the Hawaii), I = Indigenous (native to the Hawaii and other areas), P = Polynesian Introduced (prior to 1778), and A = Alien (introduced to Hawaii after 1778).

Species	Common Name	Status
Ferns and Allies		
<i>Doryopteris decora</i> Brack.	`iwa`iwa	E
<i>Nephrolepis exaltata</i> ssp. <i>hawaiiensis</i> W.H. Wagner	kupukupu	I
<i>Nephrolepis brownie</i> (Desv.) Hovenkamp & Miyam. [Syn: <i>Nephrolepis hirsutula</i> (G. Forst.) C. Presl]	scaly swordfern	A
Flowering Plants – Dicots		
<i>Tournefortia argentea</i> (L. fil) [Syn: <i>Messerschmidia argentea</i> (L. fil) I. M. Johnst.]	tree heliotrope	A
<i>Bacopa monnieri</i> (L.) Pennell	`ae`ae	I
<i>Batis maritima</i> L.	pickleweed	A
<i>Cordia subcordata</i> Lam.	kou	I
<i>Heliotropium curassavicum</i> L.	seaside heliotrope	I
<i>Hibiscus tiliaceus</i> L.	hau	I
<i>Ipomoea pes-caprae</i> ssp. <i>brasiliensis</i> (L.) Ooststr. [Syn: <i>Ipomoea brasiliensis</i> (L.) Sweet]	pōhuehue, beach morning glory	I
<i>Leucaena leucocephala</i> (Lam.) de Wit	koa haole, false koa	A
<i>Lycium sandwicense</i> A. Gray	‘ōhelo kai	I
<i>Morinda citrifolia</i> L.	noni, Indian mulberry	P
<i>Passiflora foetida</i> L.	love-in-a-mist, scarlet-fruited passion flower	A
<i>Passiflora suberosa</i> L.	huehue haole, indigo berry	A
<i>Pithecellobium dulce</i> (Roxb.) Benth.	`opiuma, Manila tamarind	A
<i>Pluchea carolinensis</i> [Syn: <i>Pluchea odorata</i> (L.) Cass., <i>Pluchea symphytifolia</i> (Mill.) Gillis]	sourbush, shrubby fleabane	A
<i>Portulaca oleracea</i> L.	pigweed, common purslane	A
<i>Portulaca pilosa</i> L. [Syn: <i>Portulaca cyanosperma</i> Egler]	kiss me quick	A
<i>Prosopis pallida</i> (Humb. & Bonpl. ex Willd.) Kunth	kiawe, mesquite	A
<i>Scaevola taccada</i> Roxb. [Syn: <i>Scaevola sericea</i> Vahl]	naupaka kahakai	I
<i>Schinus terebinthifolius</i> Raddi	Christmas berry	A
<i>Sesuvium portulacastrum</i> (L.) L.	‘ākulikuli, sea purslane	I
<i>Talinum fruticosum</i> (L.) Juss. [Syn: <i>Talinum triangulare</i>]	no common name	A
<i>Thespesia populnea</i> (L.) Sol. ex Correa	milo	I
<i>Waltheria indica</i> L. [Syn: <i>Waltheria americana</i> L.]	`uhaloa, hi`aloa	I
Flowering Plants - Monocots		
<i>Cocos nucifera</i> L.	niu, coconut	P
<i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	A
<i>Cyperus laevigatus</i> L.	makaloa	I
<i>Fimbristylis cymosa</i> ssp. <i>spathacea</i> (Roth) T. Koyama	mau`u `aki`aki	I
<i>Cyperus javanicus</i> Houtt. [Syn: <i>Mariscus javanicus</i> (Houtt.) Merr. &	`ahu`awa, `ehu`awa	I

Species	Common Name	Status
Metcalfe]		
<i>Melinis repens</i> (Willd.) Zizka [Syn: <i>Rhynchelytrum repens</i> (Willd.) Hubb.; <i>Tricholaena rosea</i> Nees]	Natal redtop	A
<i>Pandanus tectorius</i> S. Parkinson ex Z	hala, pūhala	I
<i>Cenchrus setaceus</i> (Forssk.) Morrone	fountain grass	A
<i>Cyperus polystachyos</i> Rottb. [Syn: <i>Pycneus polystachyos</i> (Rottb.) P. Beauv.]	manyspike flatsedge	I

Suggested References and Identification Guides

Integrated Taxonomic Information System, available at <https://www.itis.gov/> (accessed November 7, 2018).

NPSpecies, Information on Species in National Parks, available at <https://irma.nps.gov/NPSpecies/> (accessed November 7, 2018)

Pratt, L. W. 1998. Vegetation management strategies for three National Historical Parks on Hawaii Island CPSU Technical report 121, Cooperative National Park Resources Studies Unit Technical Report Series: Cooperative National Park Resources Studies Unit, University of Hawaii at Manoa, Honolulu, Hawaii.

Wagner, W. L., D. R. Herbst, and S. H. Sohmer. 1999. Manual of the Flowering Plants of Hawaii. Revised Edition. University of Hawaii Press and Bishop Museum Press, Honolulu, Hawaii.

Walther, M. 2004. A Guide to Hawaii's Coastal Plants. Mutual Publishing, LLC, Honolulu, Hawaii.