

Standard Operating Procedure #22

Odonate Survey in Hawaiian Streams

Version 1.0 (June 21, 2024)

Change History

New Version #	Revision Date	Author	Changes Made	Reasons for Change	Previous Version #
1.0	6/21/2024	Amanda McCutcheon	Adapted anchialine pool SOP for streams.	Odonate surveys were added to Hawaii streams monitoring in 2022.	NA

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 conduct the visual damselfly and dragonfly (collectively called odonates) survey for the Pacific Island Network (PACN) Stream Monitoring Protocol in Haleakalā National Park and Kalaupapa National Historical Park.

Overview of Sampling Procedure

Visual surveys for adult odonates are conducted for 15 minutes along each 30 m reach. The [datasheet](#) required for this procedure and a [field guide](#) are included below.

Conducting a Survey for Odonates

Prior to the start of the survey observers should be familiar with commonly observed odonates (damselflies and dragonflies, Figures SOP 22.1–22.4). One observer will slowly walk up one bank beginning at the downstream end of the reach. When they reach the end of the 30 m reach, the observer will walk slowly down the other bank. This slow walk should take a total of 15 minutes, spending about half the time on each bank and targeting the riparian zones. While the observer is walking the reach they will record information on the adult odonates observed. The number, species, gender (if possible), and behavior of all adult odonates observed in the visible area are recorded. Weather conditions at the time of the survey should also be recorded. These surveys are ideally conducted between 10 am and 2 pm when the weather is sunny, as this is when the odonates are most active, but field schedule and logistics may require surveys to occur in other conditions.

Species Identification Guide for Hawai'i

 ©HBS 1996	 ©HBS 1996	 ©HBS 1996
<i>Megalagrion hawaiiense</i> (Top: Male, Bottom: Female)	<i>Megalagrion blackburni</i> (Top: Male, Bottom: Female)	<i>Megalagrion calliphya</i> (Top: Male, Bottom: Female)
 ©HBS 1996	 ©HBS 1996	 ©HBS 1996

Figure SOP 22.1. Images of adult odonates for identification purposes. All images are from <http://hbs.bishopmuseum.org/> (last accessed 21 June 2024).

 ©HBS 1996		
<i>Megalagrion nirgohamatum</i> (Top: Male, Bottom: Female)	<i>Megalagrion pacificum</i> (Top: Male, Bottom: Female)	Top: <i>Ischnura ramburii</i> (Male) Bottom: <i>Megalagrion xanthomelas</i> (Left: Male, Right: Female)
 © HBS 1996	 ©HBS 1996	

Figure SOP 22.2. Images of adult odonates for identification purposes (continued). All images are from <http://hbs.bishopmuseum.org> (last accessed 21 June 2024).

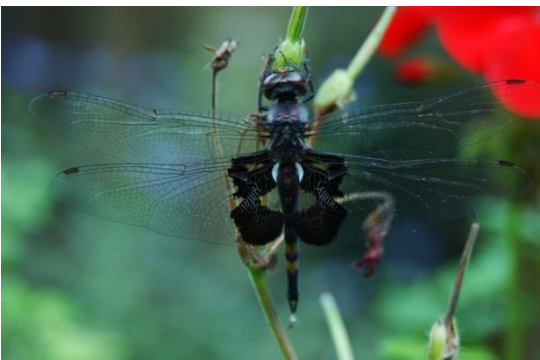
		
Top: <i>Anax junius</i> (Male) Bottom: <i>Orthemis ferruginea</i> (Male)	<i>Tramea lacerata</i> (Top: Male, Bottom: Female)	Top: <i>Anax strenuus</i> (Male) Bottom: <i>Pantala flavascens</i> (Male)
		

Figure SOP 22.3. Images of adult odonates for identification purposes (continued). All images are from <http://hbs.bishopmuseum.org> (last accessed 21 June 2024), <https://animaldiversity.org> (last accessed 21 June 2024), <https://dlnr.hawaii.gov> (last accessed 21 June 2024), and <https://dept.harpercollege.edu> (last accessed 21 June 2024). *Anax strenuus* is distinguished from *Anax junius* by its much larger size and lack of bright yellow markings on the front portion of its forewings.

	
<i>Enallagma civile</i> (Male)	<i>Ischnura posita</i> (Male)

Figure SOP 22.4. Images of adult odonates for identification purposes (continued) Images are from <http://marylandbiodiversity.com> and <https://unsm-ento.unl.edu/Odonata/ispo.html> (Last accessed August 13, 2024)

HAWAII ODONATE DATASHEET

Park:	Reach:
Observer:	Date:

Odonates (10 minutes) Start Time: _____ End Time: _____ Observer: _____

Weather (circle):	Sunny (≥ 75% sun)	Partly cloudy (≥ 25% and ≤ 75% sun)	Mostly cloudy (≤ 25% sun)	Overcast	Rain
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Taxa (damselflies)	#		
	M	F	U
<i>Enallagma civile</i> (Familiar Bluet)			
<i>Ischnura ramburii</i> (Rambur's Forktail)			
<i>Ischnura posita</i> (Fragile Forktail)			
<i>Megalagrion pacificum</i> (Pacific Hawaiian Damselfly)			
<i>Megalagrion xanthomelas</i> (Orangeblack Hawaiian Damselfly)			
<i>Megalagrion blackburni</i> (Blackburn's Hawaiian Damselfly)			
<i>Megalagrion calliphya</i> (Beautiful Hawaiian Damselfly)			
<i>Megalagrion hawaiiense</i> (Hawaiian Upland Damselfly)			
<i>Megalagrion nigrohamatum</i> (Blackhook Hawaiian Damselfly)			

Taxa (dragonflies)	#		
	M	F	U
<i>Pantala flavescens</i> (Globe Skimmer)			
<i>Anax junius</i> (Common Green Darner)			
<i>Orthemis ferruginea</i> (Roseate Skimmer)			
<i>Tramea lacerata</i> (Black Saddlebags Dragonfly)			
<i>Anax strenuus</i> (Giant Hawaiian Darner)			

Odonate Notes: _____
