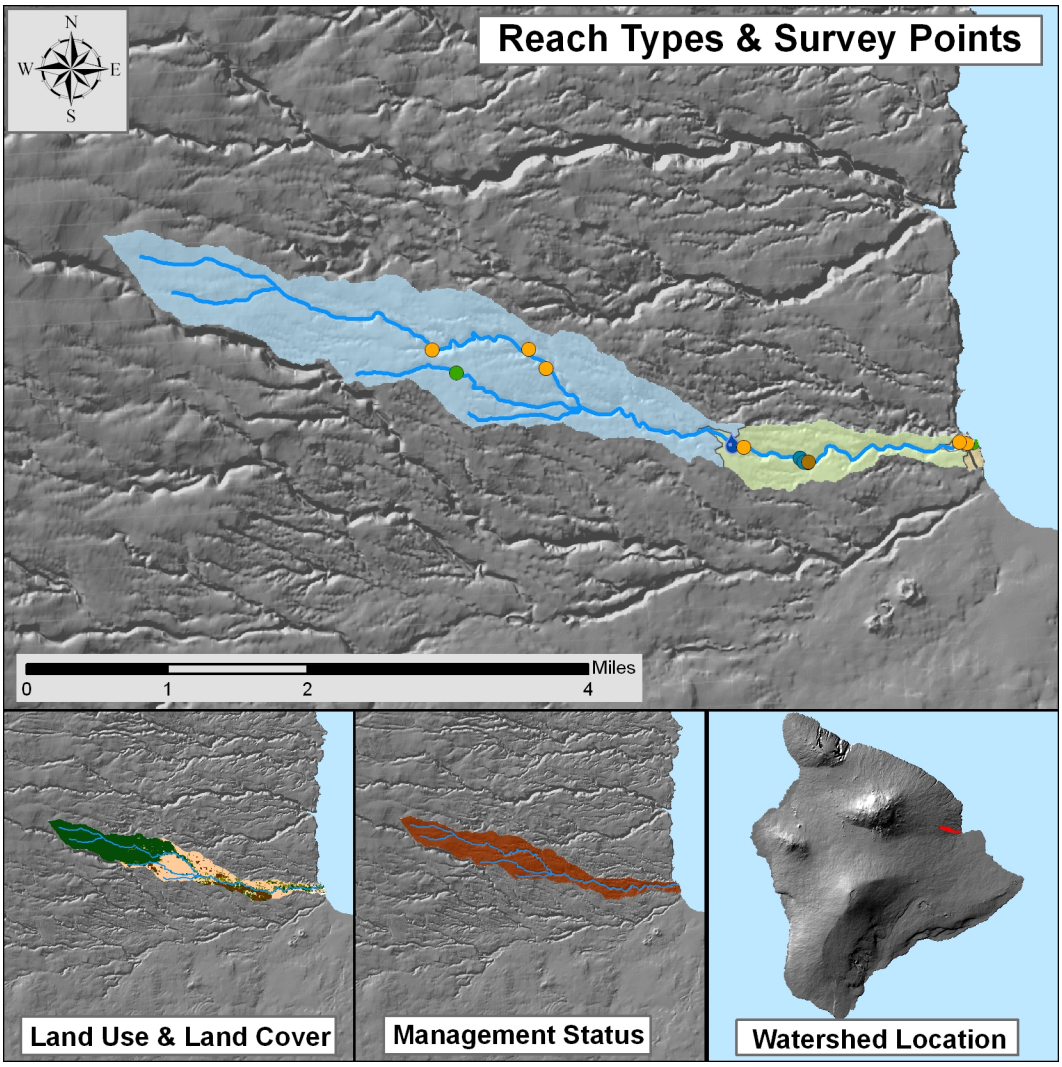
DAR Watershed Code: 82059

Pūkīhae, Hawai‘i



WATERSHED FEATURES

Pūkīhae watershed occurs on the island of Hawai‘i. The Hawaiian meaning of the name is unknown. The area of the watershed is 3.1 square mi (7.9 square km), with maximum elevation of 2333 ft (711 m). The watershed's DAR cluster code is 3, meaning that the watershed is medium small, steep in the upper watershed, and with some embayment. The percent of the watershed in the different land use districts is as follows: 72.7% agricultural, 24.9% conservation, 0% rural, and 2.5% urban.

Land Stewardship: Percentage of the land in the watershed managed or controlled by the corresponding agency or entity. Note that this is not necessarily ownership.

Military	Federal	State	OHA	County	Nature Conservancy	Other Private
0.0	0.0	0.0	0.0	0.0	0.0	100.0

Land Management Status: Percentage of the watershed in the categories of biodiversity protection and management created by the Hawaii GAP program.

Permanent Biodiversity Protection	Managed for Multiple Uses	Protected but Unmanaged	Unprotected
0.0	0.0	0.0	100.0

Land Use: Areas of the various categories of land use. These data are based on NOAA C-CAP remote sensing project.

	Percent	Square mi	Square km
High Intensity Developed	0.5	0.02	0.04
Low Intensity Developed	0.3	0.01	0.02
Cultivated	6.3	0.19	0.50
Grassland	32.8	1.00	2.60
Scrub/Shrub	7.7	0.23	0.61
Evergreen Forest	52.3	1.60	4.14
Palustrine Forested	0.0	0.00	0.00
Palustrine Scrub/Shrub	0.0	0.00	0.00
Palustrine Emergent	0.0	0.00	0.00
Estuarine Forested	0.0	0.00	0.00
Bare Land	0.0	0.00	0.00
Unconsolidated Shoreline	0.0	0.00	0.00
Water	0.0	0.00	0.00
Unclassified	0.0	0.00	0.00

STREAM FEATURES

Pūkīhae is a perennial stream. Total stream length is 10.4 mi (16.7 km). The terminal stream order is 3.

Reach Type Percentages: The percentage of the stream's channel length in each of the reach type categories.

Estuary	Lower	Middle	Upper	Headwaters
0.0	0.0	18.9	81.1	0.0

The following stream(s) occur in the watershed:
Pūkīhae

BIOTIC SAMPLING EFFORT

Biotic samples were gathered in the following year(s):
1967 1978 1979 1989 1990 1995

Distribution of Biotic Sampling: The number of survey locations that were sampled in the various reach types.

Survey type	Estuary	Lower	Middle	Upper	Headwaters
DAR Point Quadrat	0	0	3	0	0
HDFG	0	2	1	3	0
Published Report	0	1	1	1	0

BIOTA INFORMATION

Species List

Native Species		Native Species	
Crustaceans	*Atyoida bisulcata*	**Insects**	Coleoptera sp.
	Copepod sp.		*Megalagrion sp.*
	Macrobrachium grandimanus		*Telmatogeton sp.*
	Ostracod sp.		Tipulid sp.
Fish	*Awaous guamensis*		
	Gobiid sp.		
	Lentipes concolor		
	Sicyopterus stimpsoni		
Worms	Hirudinean sp.		
	Oligochaete sp.		

Introduced Species		Introduced Species	
Amphibians	*Rana catesbiana*	**Insects**	*Cheumatopsyche analis*
Crustaceans	*Hyalella azteca*		Chironomid larvae
	Procambarus clarkii		
Fish	*Cyprinus carpio*		
	Poecilia reticulata		
	Poeciliid sp.		

Species Size Data: Species size (inches) observed in DAR Point Quadrat Surveys.

Scientific Name	Status	Minimum Size	Maximum Size	Average Size
Lentipes concolor	Endemic	1.5	3.5	2.5
Awaous guamensis	Indigenous	8	10	8.9

Average Density: The densities (#/square yard) for species observed in DAR Point Quadrat Surveys averaged over all sample dates in each reach type.

Scientific Name	Status	Estuary	Low	Mid	Upper	Headwaters
Lentipes concolor	Endemic			0.2		
Awaous guamensis	Indigenous			0.06		

Species Distributions: Presence (P) of species in different stream reaches.

Scientific Name	Status	Estuary	Lower	Middle	Upper	Headwaters
Atyoida bisulcata	Endemic		P	P	P	
Macrobrachium grandimanus	Endemic		P			

Lentipes concolor	Endemic		P	
Sicyopterus stimpsoni	Endemic	P	P	
Megalagrion sp.	Endemic		P	P
Awaous guamensis	Indigenous	P	P	P
Gobiid sp.	Indigenous	P		P
Telmatogeton sp.	Indigenous		P	P
Rana catesbiana	Introduced		P	
Hyalella azteca	Introduced			P
Procambarus clarkii	Introduced		P	
Cyprinus carpio	Introduced		P	
Poecilia reticulata	Introduced	P		P
Poeciliid sp.	Introduced	P	P	P
Cheumatopsyche analis	Introduced			P
Chironomid larvae	Introduced			P
Copepod sp.	Undetermined			P
Ostracod sp.	Undetermined			P
Coleoptera sp.	Undetermined			P
Tipulid sp.	Undetermined			P
Hirudinean sp.	Undetermined			P
Oligochaete sp.	Undetermined			P

Historic Rankings: These are rankings of streams from historical studies. "Yes" means the stream was considered worthy of protection by that method. Some methods include non-biotic data in their determination. See Atlas Key for details.

Multi-Attribute Prioritization of Streams - Potential Heritage Streams (1998): No

Hawaii Stream Assessment Rank (1990): Substantial

U.S. Fish and Wildlife Service High Quality Stream (1988): No

The Nature Conservancy- Priority Aquatic Sites (1985): No

National Park Service - Nationwide Rivers Inventory (1982): No

Current DAR Decision Rule Status: The following criteria are used by DAR to consider the biotic importance of streams. "Yes" means that watershed has that quality.

Native Insect Diversity > 19 spp.	Native Macrofauna Diversity > 5 spp.	Absence of Priority 1 Introduced
No	No	No
Abundance of Any Native Species	**Presence of Candidate Endangered Species**	**Endangered Newcomb's Snail Habitat**
No	No	No

CURRENT WATERSHED AND STREAM RATINGS

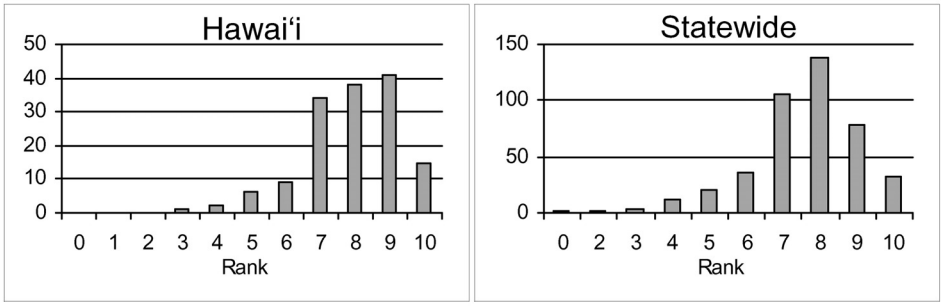
The current watershed and stream ratings are based on the data contained in the DAR Aquatic Surveys Database. The ratings provide the score for the individual watershed or stream, the distribution of ratings for that island, and the distribution of ratings statewide. This allows a better understanding of the meaning of a particular ranking and how it compares to other streams. The ratings are standardized to range from 0 to 10 (0 is lowest and 10 is highest rating) for each variable and the totals are also standardized so that the rating is not the average of each component rating. These ratings are subject to change as more data are entered into the DAR Aquatic Surveys Database and can be automatically recalculated as the data improve. In addition to the ratings, we have also provided an estimate of the confidence level of the ratings. This is called rating strength. The higher the rating strength the more likely the data and rankings represent the actual condition of the watershed, stream, and aquatic biota.

WATERSHED RATING: Pūkīhae, Hawai‘i

Land Cover Rating: Rating is based on a scoring sytem where in general forested lands score positively and developed lands score negatively.

Watershed Rating

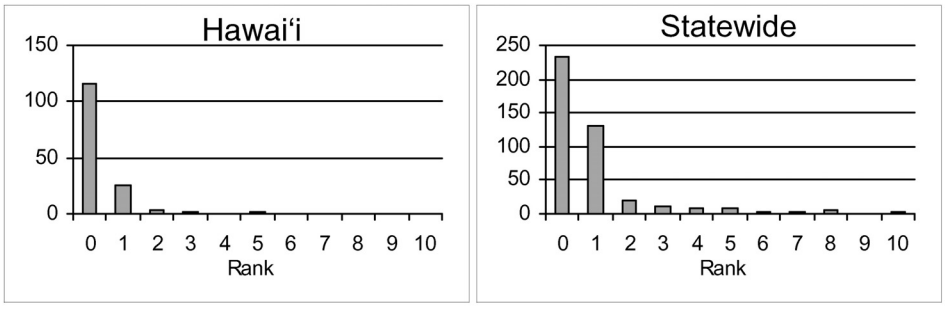
8



Shallow Waters Rating: Rating is based on a combination of the extent of estuarine and shallow marine areas associated with the watershed and stream.

Watershed Rating

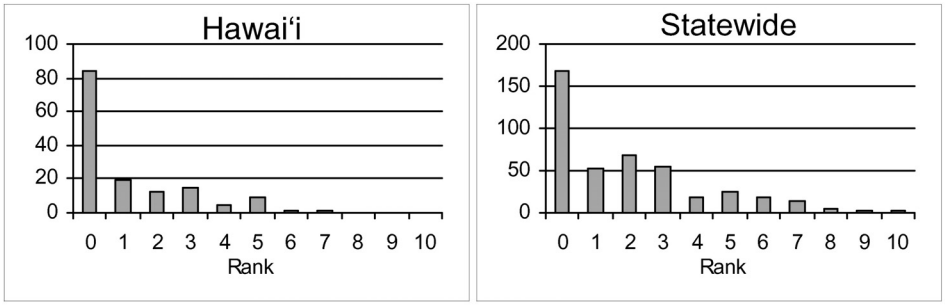
2



Stewardship Rating: Rating is based on a scoring system where higher levels of land and biodiversity protection within the watershed score positively.

Watershed Rating

0

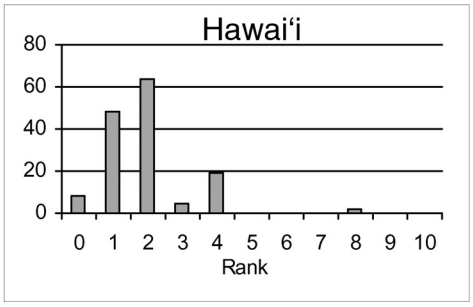


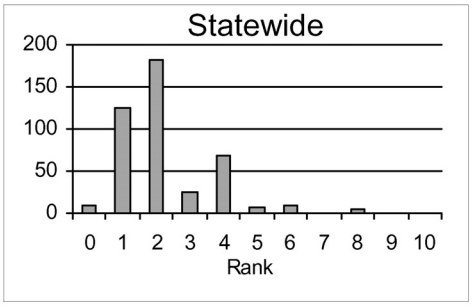
WATERSHED RATING (Cont): Pūkīhae, Hawai‘i

Size Rating: Rating is based on the watershed area and total stream length. Larger watersheds and streams score more positively.

Watershed Rating

3

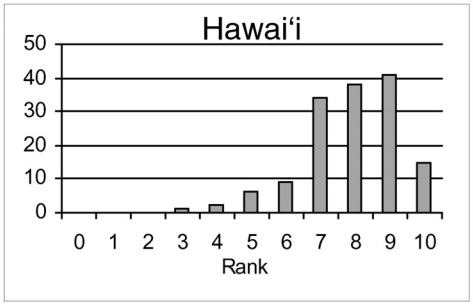


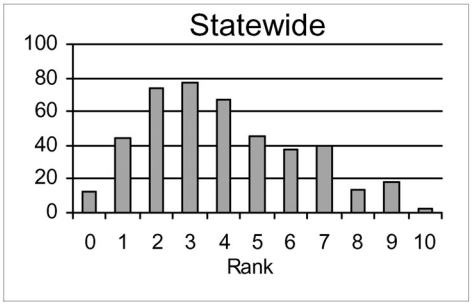


Wetness Rating: Rating is based on the average annual rainfall within the watershed. Higher rainfall totals score more positively.

Watershed Rating

9

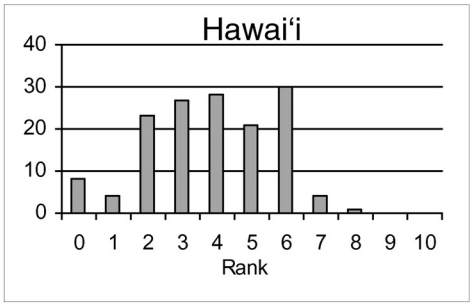


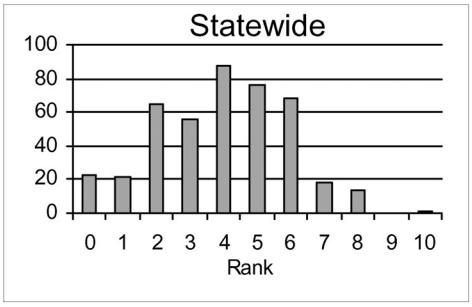


Reach Diversity Rating: Rating is based on the types and amounts of different stream reaches available in the watershed. More area in different reach types score more positively.

Watershed Rating

4

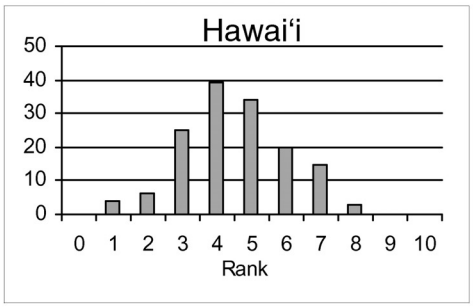


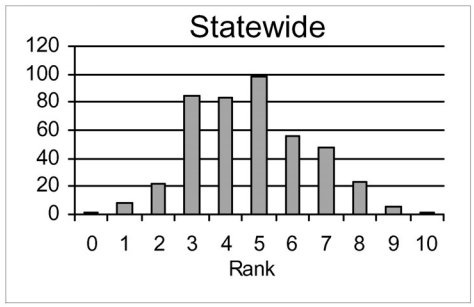


Total Watershed Rating: Rating is based on combination of Land Cover Rating, Shallow Waters Rating, Stewardship Rating, Size Rating, Wetness Rating, and Reach Diversity Rating.

Watershed Rating

6



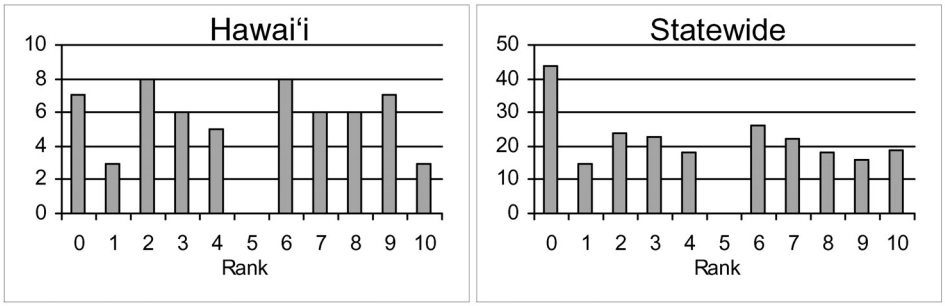


BIOLOGICAL RATING: Pūkīhae, Hawai‘i

Native Species Rating: Rating is based on the number of native species observed in the watershed.

Stream Rating

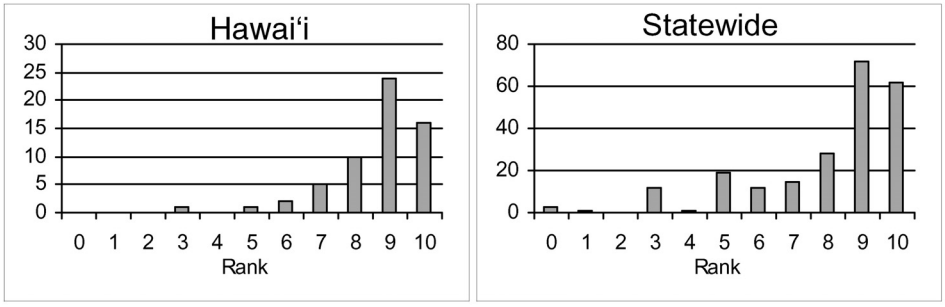
6



Introduced Genera Rating: Rating is based on the number of introduced genera observed in the watershed.

Stream Rating

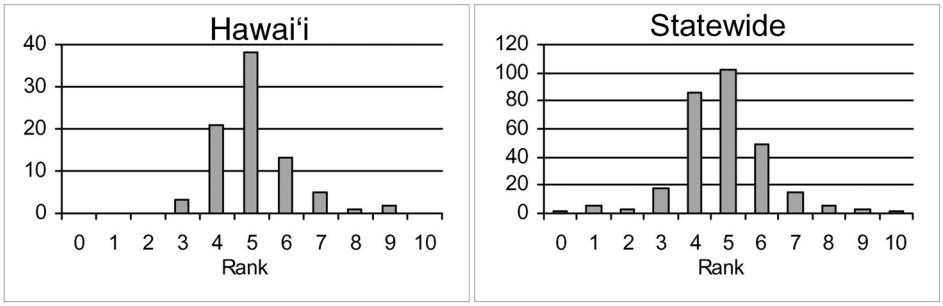
9



All Species' Score Rating: Rating is based on the Hawaii Stream Assessment scoring system where native species score positively and introduced species score negatively.

Stream Rating

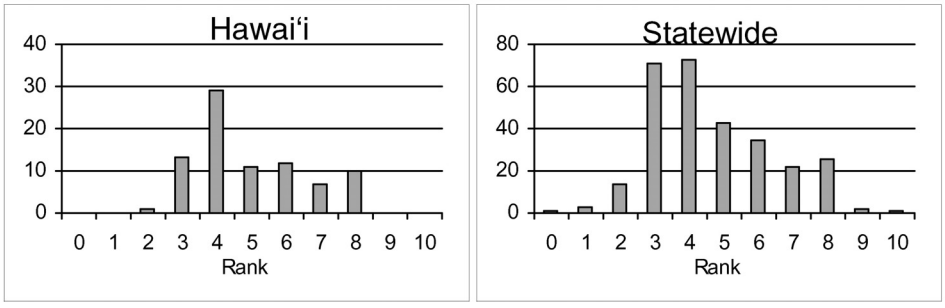
5



Total Biological Rating: Rating is the combination of the Native Species Rating, Introduced Genera Rating, and the All Species' Score Rating.

Stream Rating

6

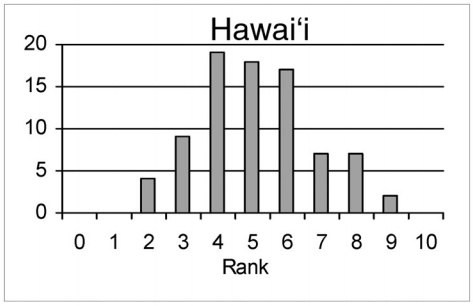


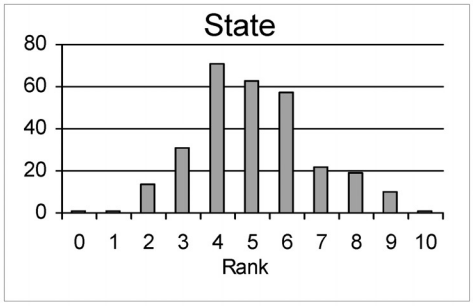
OVERALL RATING: Pūkīhae, Hawai'i

Overall Rating: Rating is a combination of the Total Watershed Rating and the Total Biological Rating.

Watershed Rating

6



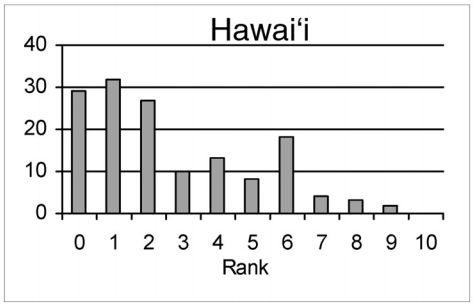


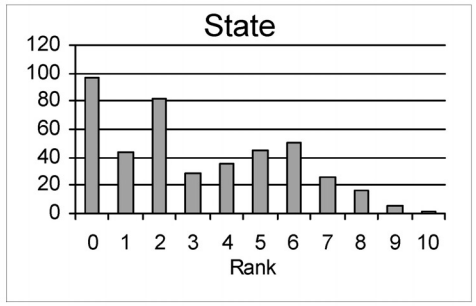
RATING STRENGTH: Pūkīhae, Hawai'i

Rating Strength: Represents an estimate of the overall study effort in the stream and is a combination of the number of studies, number of different reaches surveyed, and the number of different survey types.

Information Rating

6





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