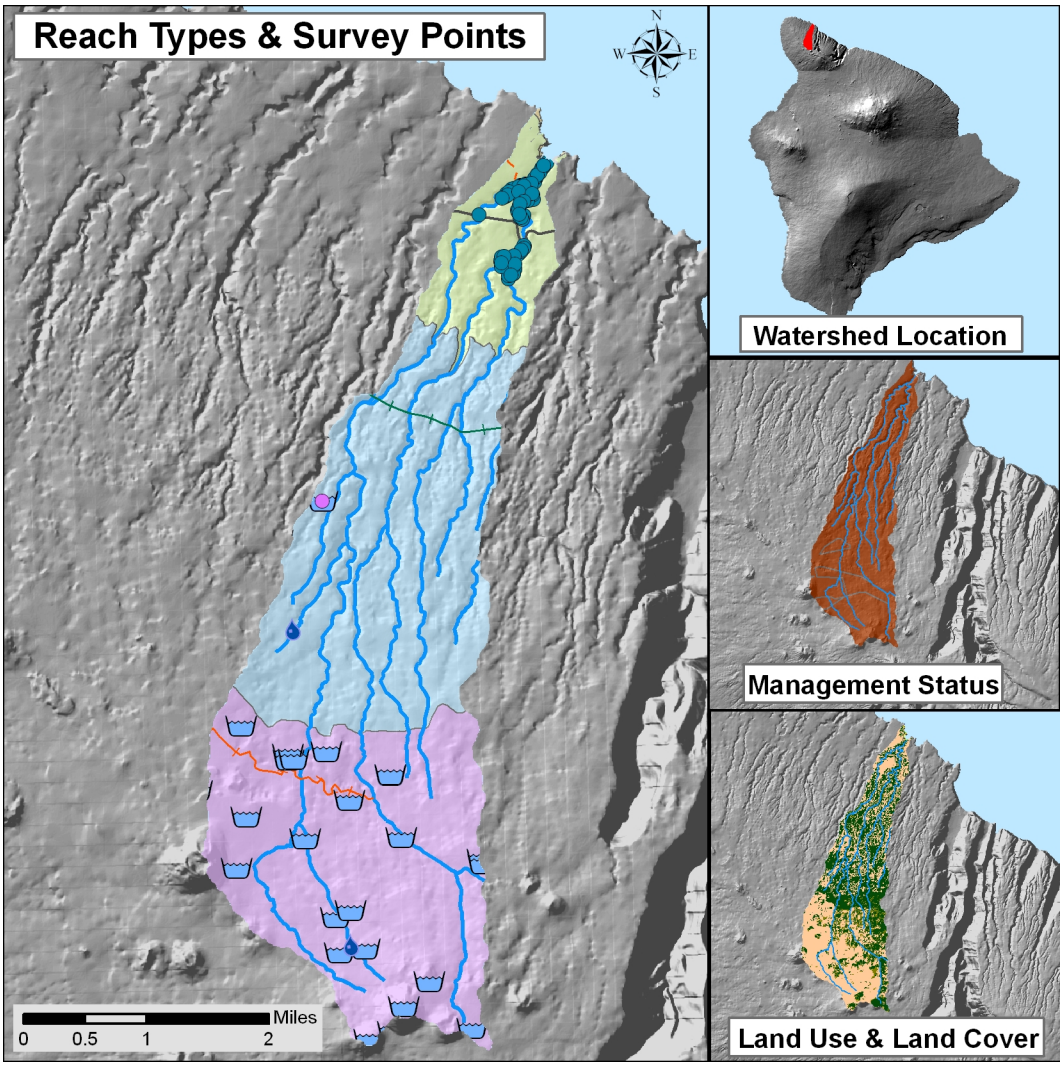
DAR Watershed Code: 81012

ʻAʻamakāō Gulch, Hawaiʻi



WATERSHED FEATURES

ʻAʻamakāō Gulch watershed occurs on the island of Hawaiʻi. The Hawaiian meaning of the name is "crowds [of] black crabs". The area of the watershed is 10.7 square mi (27.8 square km), with maximum elevation of 4009 ft (1222 m). The watershed's DAR cluster code is not yet determined. The percent of the watershed in the different land use districts is as follows: 77.4% agricultural, 22.6% conservation, 0% rural, and 0% 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	8.5	0.0	0.0	0.0	91.5

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	0.0	0.00	0.00
Low Intensity Developed	0.1	0.01	0.04
Cultivated	0.0	0.00	0.00
Grassland	50.9	5.47	14.16
Scrub/Shrub	6.6	0.71	1.84
Evergreen Forest	42.3	4.54	11.77
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	0.1	0.01	0.02
Unconsolidated Shoreline	0.0	0.00	0.00
Water	0.0	0.00	0.00
Unclassified	0.0	0.00	0.00

STREAM FEATURES

ʻAʻamakāō Gulch is a perennial stream. Total stream length is 33 mi (53.2 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	2.1	15.2	56.3	26.4

The following stream(s) occur in the watershed:

ʻAʻamakāō	Hooleipalaoa	Mahinakaaka	Puwaiole	Waipuhi
Waipunalau	Walaohia			

BIOTIC SAMPLING EFFORT

Biotic samples were gathered in the following year(s):

1962	1979	1980	2004	2007

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 Observation	0	2	2	0	0
DAR Point Quadrat	0	43	48	0	0
DAR Rapid BioAssessment	0	0	2	0	0
Reservoir	0	0	0	1	0

BIOTA INFORMATION

Species List

Native Species

Crustaceans	*Atyoida bisulcata*
	Macrobrachium sp.
Fish	*Awaous guamensis*
	Eleotris sandwicensis
	Gobiid sp.
	Kuhlia sp.
	Kuhlia xenura
	Lentipes concolor
	Sicyopterus stimpsoni
	Stenogobius hawaiiensis
Snails	*Neritina granosa*

Introduced Species

Crustaceans	*Macrobrachium lar*
Fish	*Carassius auratus*
	Gambusia affinis
	Lepomis sp.
	Poecilia reticulata
	unidentified poeciliid
Snails	*Melanoides tuberculata*

Species found in Impoundments

Fish	*Carassius auratus*
	Lepomis sp.
	unidentified poeciliid

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

Scientific Name	Status	Minimum Size	Maximum Size	Average Size
Macrobrachium lar	Introduced	0.5	5	2.5
Macrobrachium sp.	Unknown	1.5	1.5	1.5
Eleotris sandwicensis	Endemic	2	5	3.5
Kuhlia xenura	Endemic	1	2	1.6
Lentipes concolor	Endemic	1.5	2.5	2.2
Sicyopterus stimpsoni	Endemic	0.75	3.5	1.5

Stenogobius hawaiiensis	Endemic	1	1.5	1.1
Awaous guamensis	Indigenous	0.75	6	2.0
Gobiid sp.	Indigenous	0.625	1.5	0.9
Kuhlia sp.	Indigenous	1	3	2.0
Gambusia affinis	Introduced	0.5	1	0.7
Neritina granosa	Endemic	0.125	1	0.6
Melanoides tuberculata	Introduced	0.25	1	0.8

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
Eleotris sandwicensis	Endemic		0.17	0.08		
Kuhlia xenura	Endemic		0.4			
Lentipes concolor	Endemic			0.24		
Neritina granosa	Endemic		0.75	1.43		
Sicyopterus stimpsoni	Endemic		2.02	0.72		
Stenogobius hawaiiensis	Endemic		0.35			
Awaous guamensis	Indigenous		1.09	0.4		
Gobiid sp.	Indigenous		2.07	0.56		
Kuhlia sp.	Indigenous		2.65			
Gambusia affinis	Introduced		1.21	0.04		
Macrobrachium lar	Introduced		2.19	1.12		
Melanoides tuberculata	Introduced		0.86	0.04		
Macrobrachium sp.	Unknown			0.08		

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

Scientific Name	Status	Estuary	Lower	Middle	Upper	Headwaters
Eleotris sandwicensis	Endemic		P	P		
Kuhlia xenura	Endemic		P			
Lentipes concolor	Endemic			P		
Sicyopterus stimpsoni	Endemic		P	P		
Stenogobius hawaiiensis	Endemic		P			
Neritina granosa	Endemic		P	P		
Awaous guamensis	Indigenous		P	P		
Gobiid sp.	Indigenous		P	P		
Kuhlia sp.	Indigenous		P			
Macrobrachium lar	Introduced		P	P		
Carassius auratus	Introduced				P	
Gambusia affinis	Introduced		P	P		
Lepomis sp.	Introduced				P	
unidentified poeciliid	Introduced				P	
Melanoides tuberculata	Introduced		P	P		
Macrobrachium sp.	Unknown			P		

HISTORIC RANKINGS

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): Outstanding

U.S. Fish and Wildlife Service High Quality Stream (1988): Yes

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	Yes	No
Abundance of Any Native Species	**Presence of Candidate Endangered Species**	**Endangered Newcomb's Snail Habitat**
No	No	No

CURRENT WATERSHED AND STREAM RATINGS

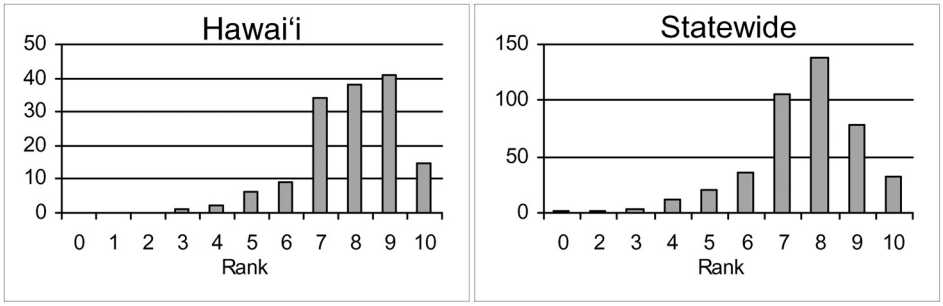
The current watershed and stream ratings are based on the data contained in the DAR Aquatic Surveys Database. The ratings provide the score for the individual watershed or stream, the distribution of ratings for that island, and the distribution of ratings statewide. This allows a better understanding 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: ʻAʻamakāō Gulch, Hawaiʻi

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

Watershed Rating

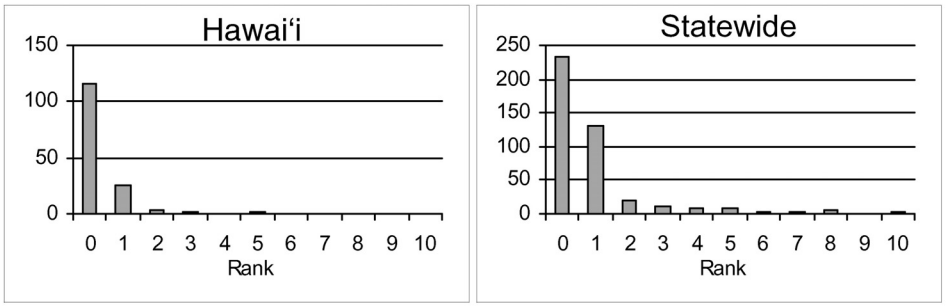
8



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

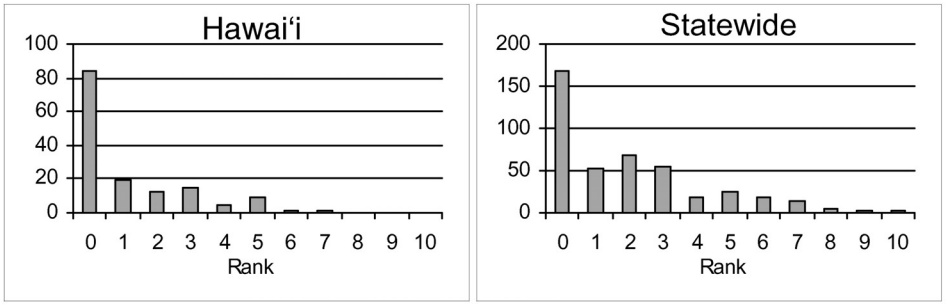
0



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

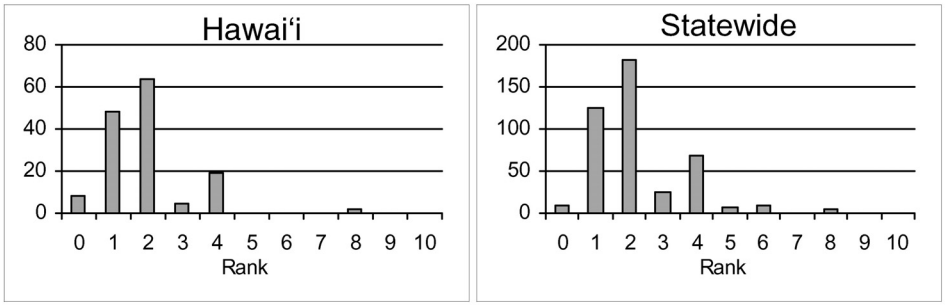


WATERSHED RATING (Cont): ʻAʻamakāō Gulch, Hawaiʻi

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

Watershed Rating

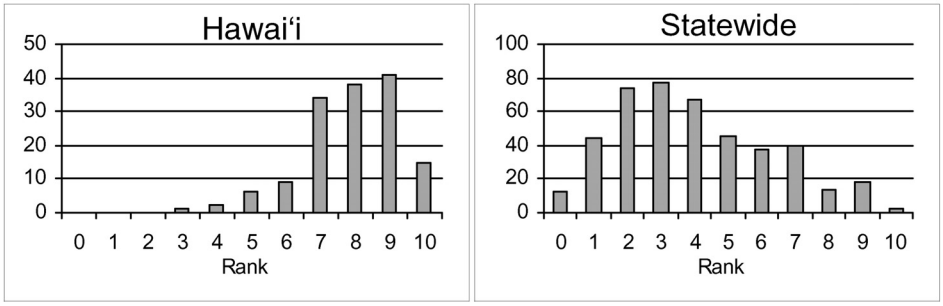
4



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

Watershed Rating

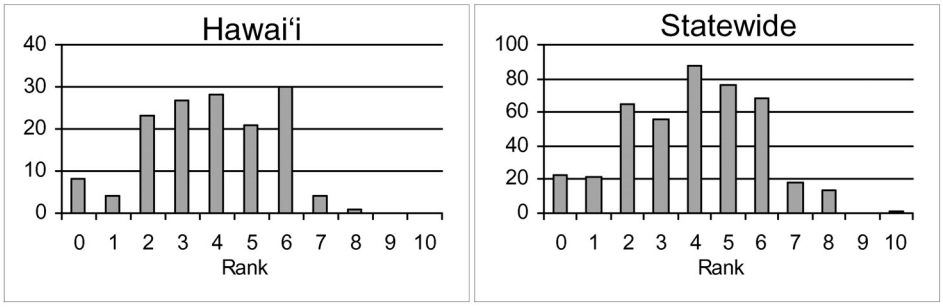
4



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

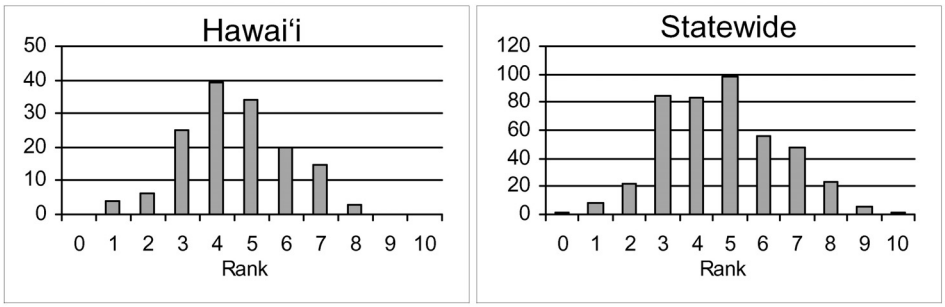
7



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

5

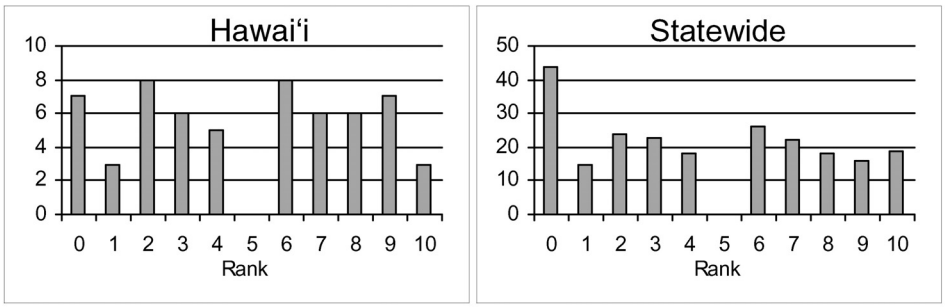


BIOLOGICAL RATING: ʻAʻamakāō Gulch, Hawaiʻi

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

Stream Rating

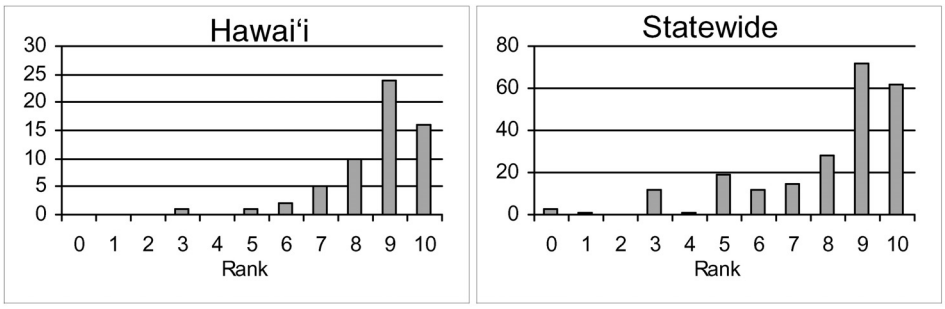
9



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

Stream Rating

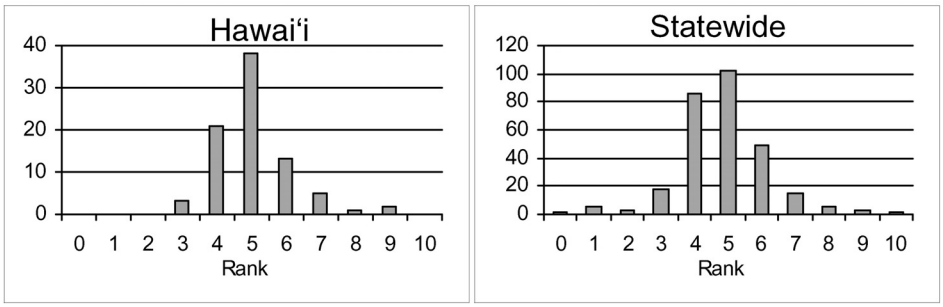
8



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

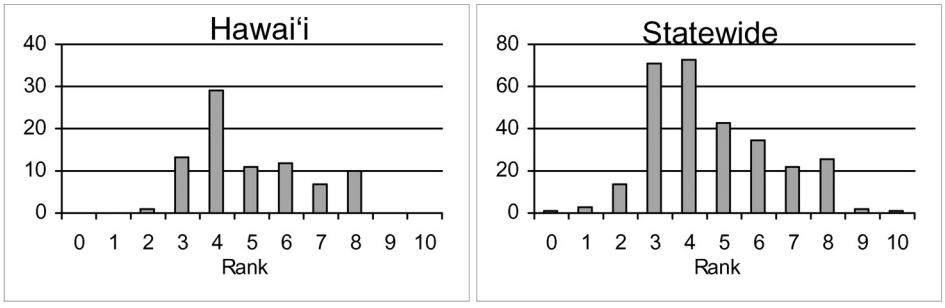
5



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

Stream Rating

7

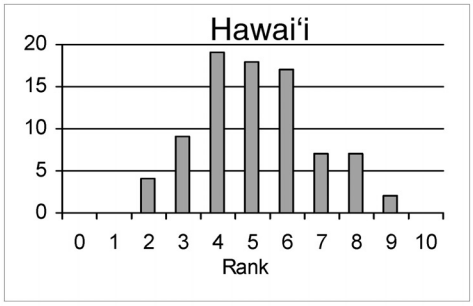


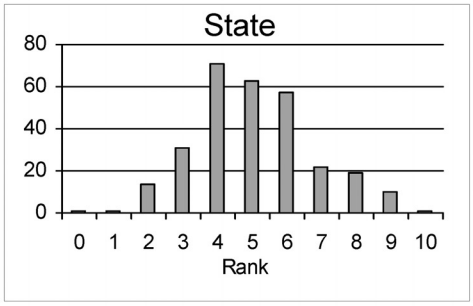
OVERALL RATING: ʻAʻamakāō Gulch, Hawaiʻi

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

Watershed Rating

6



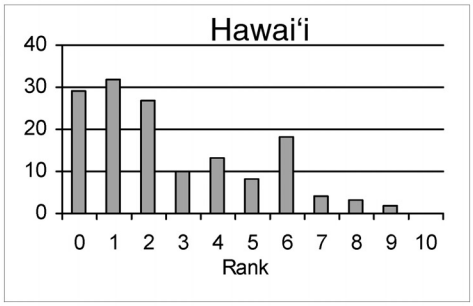


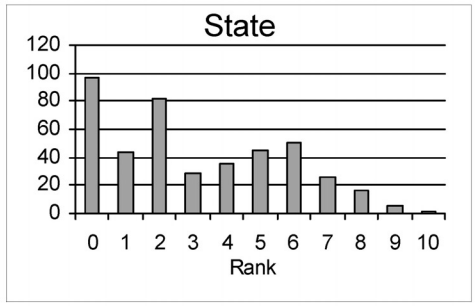
RATING STRENGTH: ʻAʻamakāō Gulch, Hawaiʻi

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

5





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