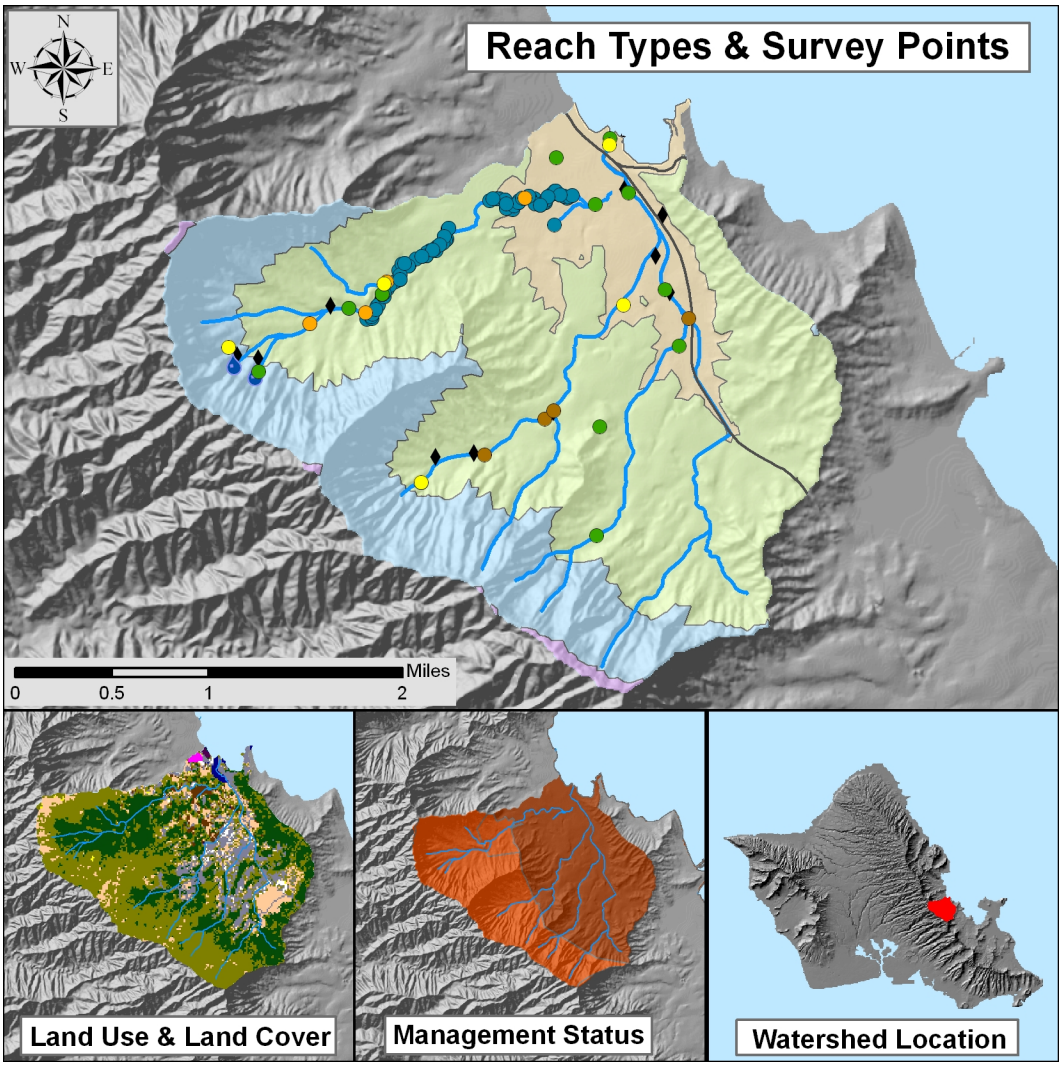
DAR Watershed Code: 32007

Kahaluʻu, Oʻahu



WATERSHED FEATURES

Kahaluʻu watershed occurs on the island of Oʻahu. The Hawaiian meaning of the name is "diving place". The area of the watershed is 6.3 square mi (16.2 square km), with maximum elevation of 2762 ft (842 m). The watershed's DAR cluster code is 4, meaning that the watershed is medium size, steep in the upper watershed, and with embayment. The percent of the watershed in the different land use districts is as follows: 0.2% agricultural, 54.5% conservation, 0% rural, and 45.4% 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	0.3	0.0	45.0	0.0	54.8

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	45.2	54.8

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	1.0	0.06	0.16
Low Intensity Developed	11.0	0.69	1.78
Cultivated	2.0	0.13	0.33
Grassland	9.4	0.59	1.53
Scrub/Shrub	43.8	2.74	7.09
Evergreen Forest	31.8	1.99	5.14
Palustrine Forested	0.0	0.00	0.00
Palustrine Scrub/Shrub	0.0	0.00	0.00
Palustrine Emergent	0.2	0.01	0.03
Estuarine Forested	0.1	0.01	0.02
Bare Land	0.2	0.01	0.03
Unconsolidated Shoreline	0.0	0.00	0.00
Water	0.5	0.03	0.08
Unclassified	0.0	0.00	0.00

STREAM FEATURES

Kahaluʻu is a perennial stream. Total stream length is 9.8 mi (15.7 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
2.9	0.0	80.9	16.2	0.0

The following stream(s) occur in the watershed:

ʻĀhuimanu Kahaluʻu Waiheʻe

BIOTIC SAMPLING EFFORT

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

1961	1975	1978	1990	1991	1992	1995
1999	2000	2001	2003	2005		

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

Survey type	Estuary	Lower	Middle	Upper	Headwaters
Damselfly Surveys	1	1	5	1	0
DAR General Surveys	0	2	0	0	0
DAR Observation	0	9	9	0	0
DAR Point Quadrat	0	29	37	0	0
DAR Report	0	0	1	0	0
HDFG	0	1	3	0	0
Published Report	1	5	13	1	0
Unpublished Report	0	1	1	0	0

BIOTA INFORMATION

Species List

Native Species

Crustaceans	*Atyoida bisulcata*
	Macrobrachium grandimanus
	Macrobrachium sp.
Fish	*Awaous guamensis*
	Eleotris sandwicensis
	Gobiid sp.
	Kuhlia sp.
	Kuhlia xenura
	Lentipes concolor
	Mugil cephalus
	Sicyopterus stimpsoni
	Sphyraena barracuda
	Stenogobius hawaiiensis
Worms	Hirudinean sp.
	Namalycastis abiuma
	Namalycastis sp.
	Oligochaete sp.
	Polychaete sp.

Native Species

Insects	Coleoptera sp.
	Collembola sp.
	Dasyrhicnoessa insularis
	Ephydrid sp.
	Hemerodromia sp.
	Hydroptila sp.
	Limonia sp.
	Megalagrion hawaiiense
	Megalagrion nigrohamatum nigrolineatum
	Megalagrion oceanicum
	Megalagrion sp.
	Microvelia vagans
	Orthocladius sp.

Introduced Species

Amphibians	*Bufo marinus*
Clams	*Corbicula fluminea*
Crustaceans	*Macrobrachium lar*
	Neocaridina denticulata
	Procambarus clarkii
Fish	*Archocentrus nigrofasciatus*
	Clarias fuscus
	Corydoras aeneus
	Gambusia affinis
	Hypostomus watwata
	Misgurnus anguillicaudatus

Introduced Species

Insects	*Cheumatopsyche analis*
	Cheumatopsyche pettiti
	Chironomid larvae
	Cricotopus bicinctus
	Culicid sp.
	Discocerina mera
	Dixa longistyla
	Hydroptila arctia
	Ischnura ramburi
	Mesovelia amoena
	Oxythira maya

	Poecilia latipinna	Trichoptera larvae
	Poecilia reticulata	Veliid sp.
	Poecilia sphenops	
	Poeciliid sp.	
	Sarotherodon melanotheron	
	Tilapia sp.	
	unidentified poeciliid	
	Xiphophorus helleri	
	Xiphophorus maculatus	
	Xiphophorus sp.	
Snails	Gastropod sp.	
	Lymnaeid sp.	
	Melania sp.	
	Melanoides tuberculata	
	Physid sp.	
	Pila conica	
	Pomacea canaliculata	
	Tarebia granifera	
	Thiarid sp.	

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

Scientific Name	Status	Minimum Size	Maximum Size	Average Size
Corbicula fluminea	Introduced	0.25	0.25	0.3
Atyoida bisulcata	Endemic	0.75	2	1.6
Macrobrachium lar	Introduced	1.5	4	2.6
Eleotris sandwicensis	Endemic	2.5	3	2.8
Kuhlia xenura	Endemic	1.5	3	2.6
Stenogobius hawaiiensis	Endemic	2	3	2.4
Awaous guamensis	Indigenous	1.5	4	2.9
Archocentrus nigrofasciatus	Introduced	1.5	4	2.8
Gambusia affinis	Introduced	1.5	1.5	1.5
Hypostomus watwata	Introduced	2	8	5.1
Poecilia reticulata	Introduced	0.5	1	0.9
Poecilia sphenops	Introduced	1	3	1.9
Poeciliid sp.	Introduced	0.25	2	0.7
Xiphophorus helleri	Introduced	1	3.5	1.8
Lymnaeid sp.	Introduced	0.5	0.75	0.6
Melania sp.	Introduced	0.5	0.5	0.5
Melanoides tuberculata	Introduced	0.5	0.75	0.6
Tarebia granifera	Introduced	0.5	0.75	0.7

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
Atyoida bisulcata	Endemic			0.29		

Eleotris sandwicensis	Endemic	0.11	
Kuhlia xenura	Endemic	0.79	
Stenogobius hawaiiensis	Endemic	0.45	
Awaous guamensis	Indigenous	0.23	0.57
Archocentrus nigrofasciatus	Introduced	0.23	
Corbicula fluminea	Introduced	0.11	
Gambusia affinis	Introduced	0.11	
Hypostomus watwata	Introduced	1.13	
Lymnaeid sp.	Introduced	0.11	0.21
Macrobrachium lar	Introduced	0.34	0.5
Melania sp.	Introduced	0.23	0.07
Melanoides tuberculata	Introduced		1.86
Poecilia reticulata	Introduced		1.36
Poecilia sphenops	Introduced	9.52	1.29
Poeciliid sp.	Introduced	0.23	0.36
Tarebia granifera	Introduced	0.45	0.07
Xiphophorus helleri	Introduced	5.55	9.75

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	P		
Eleotris sandwicensis	Endemic		P			
Kuhlia xenura	Endemic	P	P			
Lentipes concolor	Endemic			P		
Sicyopterus stimpsoni	Endemic			P		
Stenogobius hawaiiensis	Endemic		P			
Megalagrion hawaiiense	Endemic			P		
Megalagrion nigrohamatum nigrolineatum	Endemic			P	P	
Megalagrion oceanicum	Endemic			P		
Megalagrion sp.	Endemic		P	P		
Microvelia vagans	Endemic			P		
Orthocladius sp.	Endemic			P		
Awaous guamensis	Indigenous		P	P		
Gobiid sp.	Indigenous		P	P		
Kuhlia sp.	Indigenous		P			
Mugil cephalus	Indigenous	P				
Sphyraena barracuda	Indigenous	P				
Dasyrhicnoessa insularis	Indigenous	P				
Limonia sp.	Indigenous			P		
Namalycastis sp.	Indigenous			P		

Bufo marinus	Introduced		P	P	
Corbicula fluminea	Introduced		P		
Macrobrachium lar	Introduced		P	P	P
Neocaridina denticulata	Introduced			P	
Procambarus clarkii	Introduced		P	P	
Archocentrus nigrofasciatus	Introduced		P		
Clarias fuscus	Introduced		P		
Corydoras aeneus	Introduced		P		
Gambusia affinis	Introduced	P	P	P	
Hypostomus watwata	Introduced		P		
Misgurnus anguillicaudatus	Introduced		P	P	
Poecilia latipinna	Introduced			P	
Poecilia reticulata	Introduced		P	P	
Poecilia sphenops	Introduced		P	P	
Poeciliid sp.	Introduced		P	P	
Sarotherodon melanotheron	Introduced		P		
Tilapia sp.	Introduced	P	P		
unidentified poeciliid	Introduced	P	P		
Xiphophorus helleri	Introduced		P	P	
Xiphophorus maculatus	Introduced			P	
Xiphophorus sp.	Introduced			P	
Cheumatopsyche analis	Introduced			P	
Chironomid larvae	Introduced			P	
Cricotopus bicinctus	Introduced	P		P	
Culicid sp.	Introduced			P	
Discocerina mera	Introduced	P			
Dixa longistyla	Introduced			P	
Ischnura ramburi	Introduced	P	P		
Mesovelia amoena	Introduced			P	
Oxythira maya	Introduced			P	
Trichoptera larvae	Introduced			P	
Veliid sp.	Introduced			P	
Lymnaeid sp.	Introduced		P	P	
Melania sp.	Introduced		P	P	
Melanoides tuberculata	Introduced			P	
Physid sp.	Introduced			P	
Tarebia granifera	Introduced		P	P	
Thiarid sp.	Introduced			P	
Coleoptera sp.	Undetermined			P	
Ephydrid sp.	Undetermined			P	
Hydroptila sp.	Undetermined			P	
Hirudinean sp.	Undetermined			P	

Oligochaete sp.	Undetermined		P
Polychaete sp.	Undetermined		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): Moderate

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

CURRENT WATERSHED AND STREAM RATINGS

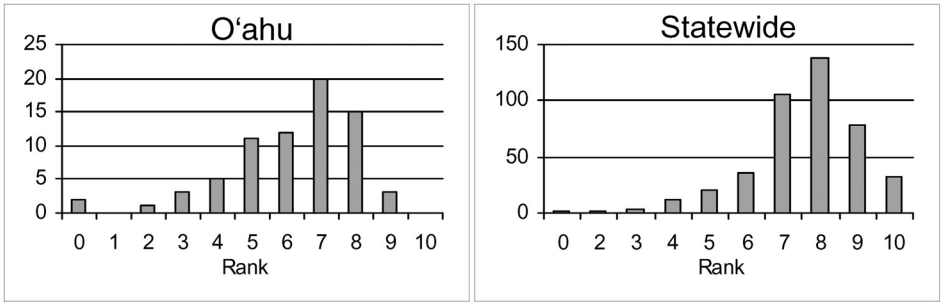
The current watershed and stream ratings are based on the data contained in the DAR Aquatic Surveys Database. The ratings provide the score for the individual watershed or stream, the distribution of ratings for that island, and the distribution of ratings statewide. This allows a better understanding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

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

Watershed Rating

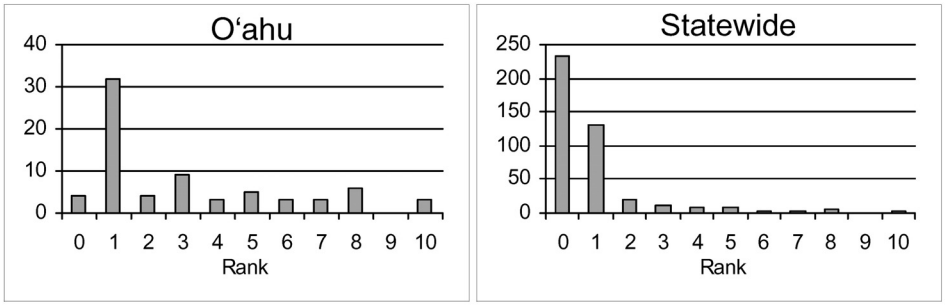
7



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

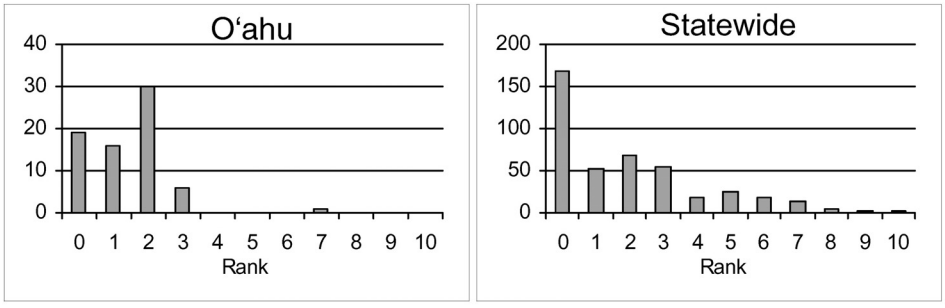
4



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

Watershed Rating

2

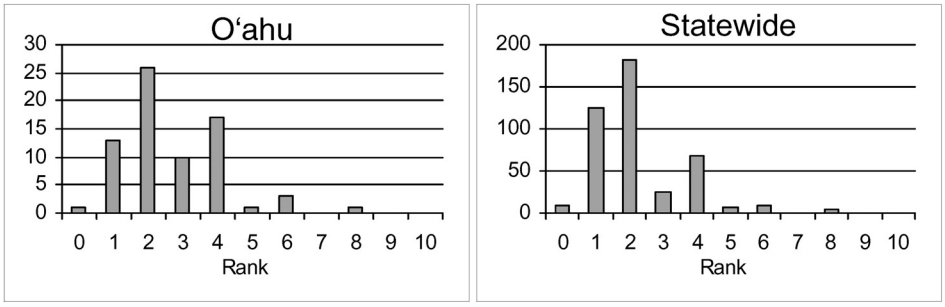


WATERSHED RATING (Cont): Kahaluʻu, Oʻahu

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

Watershed Rating

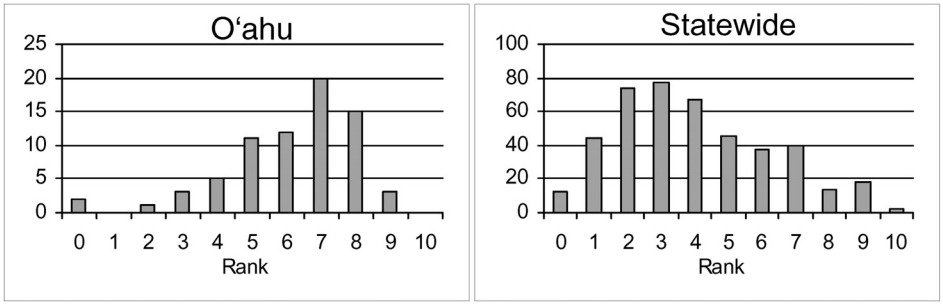
3



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

Watershed Rating

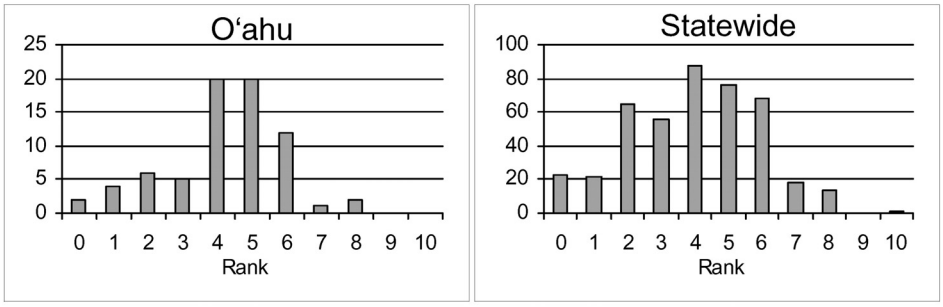
4



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

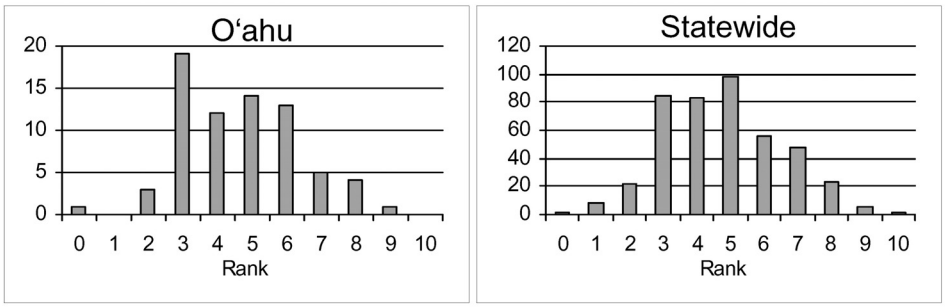
4



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

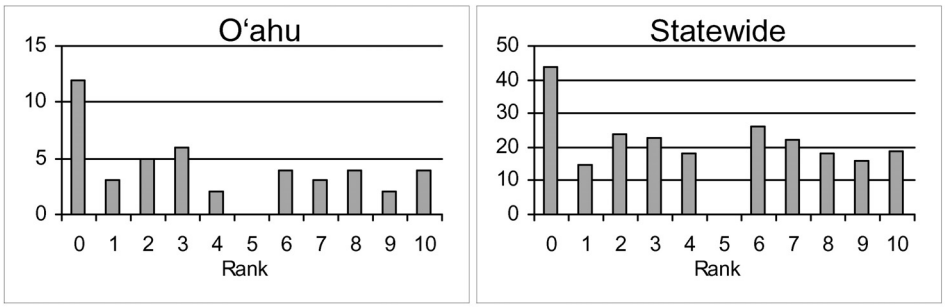


BIOLOGICAL RATING: Kahaluʻu, Oʻahu

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

Stream Rating

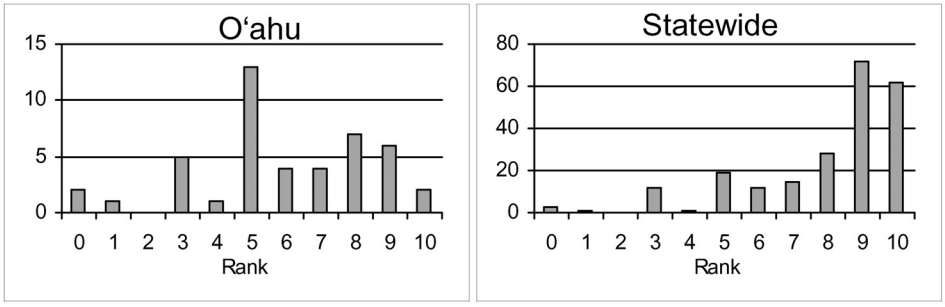
9



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

Stream Rating

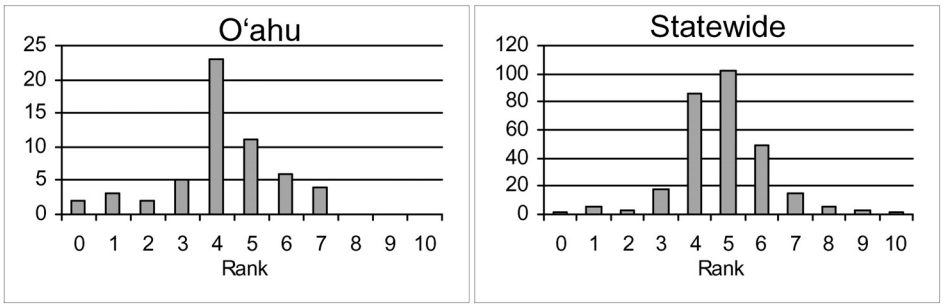
3



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

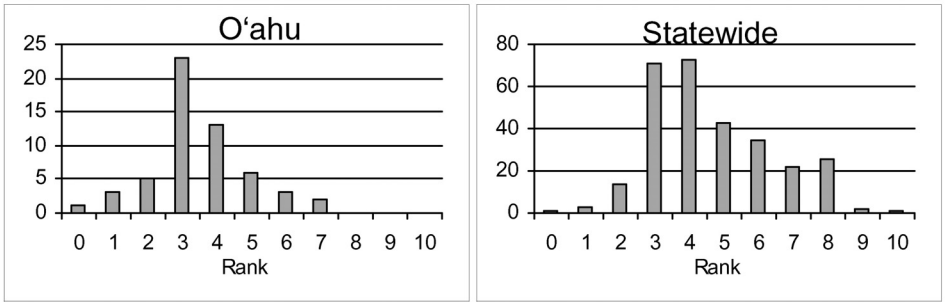
2



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

Stream Rating

4

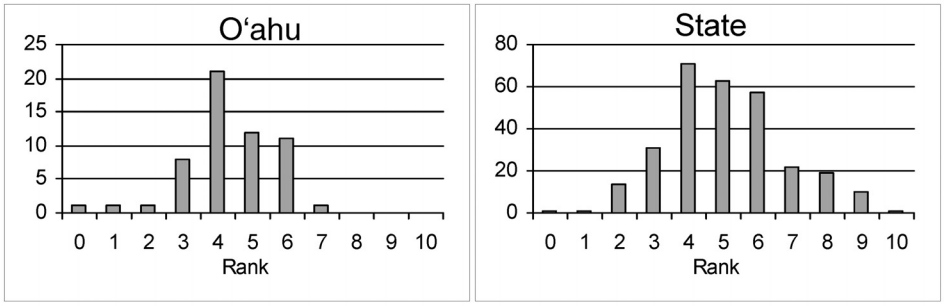


OVERALL RATING: Kahaluʻu, Oʻahu

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

Watershed Rating

5

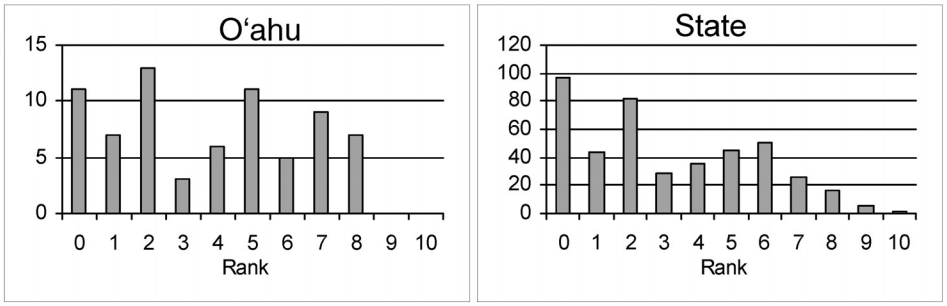


RATING STRENGTH: Kahaluʻu, Oʻahu

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

8



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