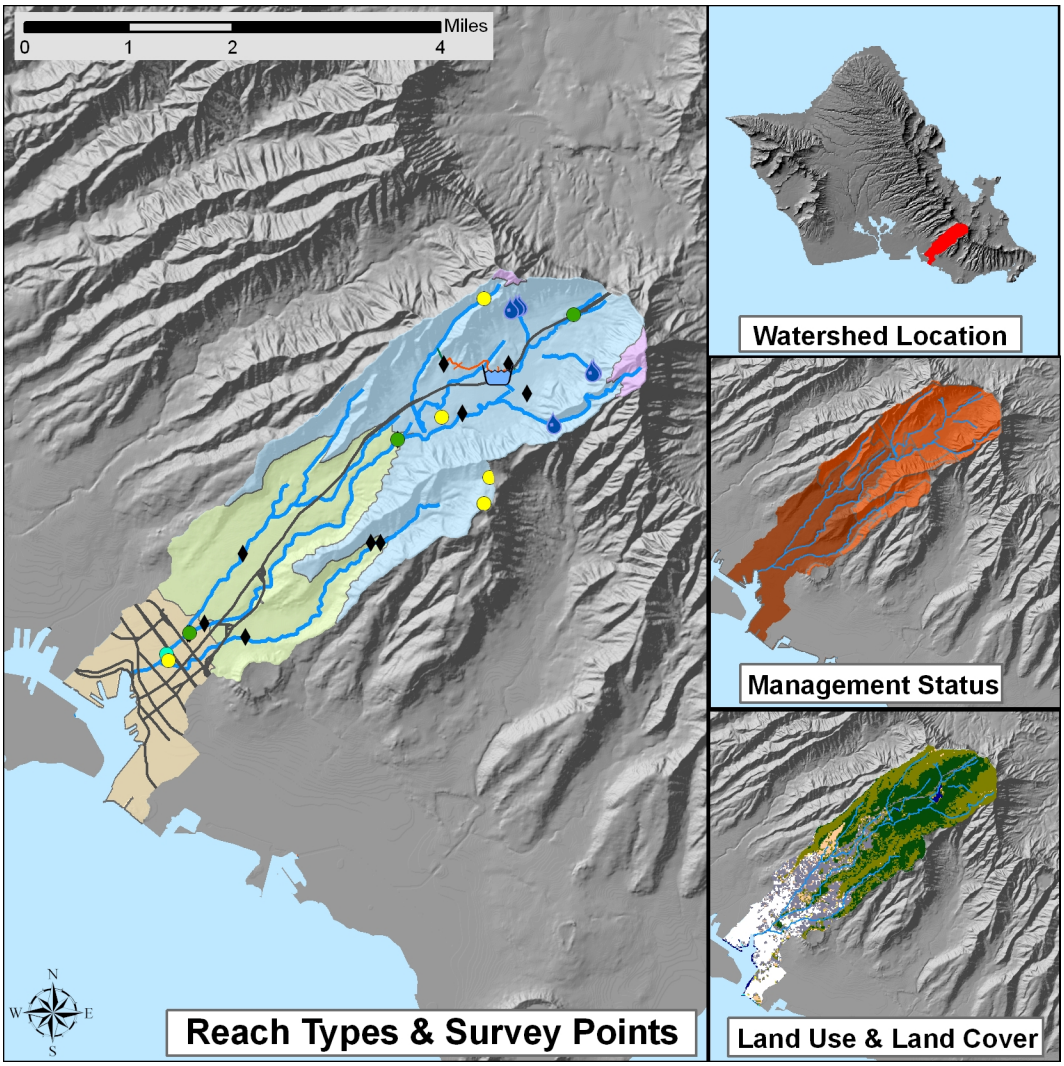
DAR Watershed Code: 33009

Nu‘uanu, O‘ahu



WATERSHED FEATURES

Nu‘uanu watershed occurs on the island of O‘ahu. The Hawaiian meaning of the name is “cool height”. The area of the watershed is 9.5 square mi (24.6 square km), with maximum elevation of 3146 ft (959 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% agricultural, 55.3% conservation, 0% rural, and 44.7% 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	0.3	42.4	0.0	8.8	0.0	48.5

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	55.4	44.6

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	15.3	1.46	3.78
Low Intensity Developed	17.4	1.65	4.28
Cultivated	0.0	0.00	0.00
Grassland	4.0	0.38	0.98
Scrub/Shrub	30.8	2.93	7.58
Evergreen Forest	31.5	2.99	7.75
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	0.2	0.02	0.05
Unconsolidated Shoreline	0.1	0.00	0.01
Water	0.8	0.08	0.21
Unclassified	0.0	0.00	0.00

STREAM FEATURES

Nu‘uanu is a perennial stream. Total stream length is 21.2 mi (34.1 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
3.3	0.0	44.9	50.9	0.9

The following stream(s) occur in the watershed:

‘Ālewa	Lulumahu	Makuku	Moole	Niniko
Nu‘uanu	Pauoa	Waolani		

BIOTIC SAMPLING EFFORT

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

1915	1929	1967	1974	1977	1978	1982
1990	1996	1998	2000	2001	2002	

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	0	0	8	0
Published Report	0	1	0	1	0
USGS Surveys	1	0	0	0	0

BIOTA INFORMATION

Species List

Native Species

Crustaceans	Amphipod sp.
	Atyoida bisulcata
	Macrobrachium grandimanus
	Ostracod sp.
Fish	*Awaous guamensis*
	Eleotris sandwicensis
	Kuhlia sandvicensis
	Kuhlia xenura
	Lentipes concolor
	Mugil cephalus
	Sicyopterus stimpsoni
	Stenogobius hawaiiensis
Snails	*Ferrissia sharpi*
	Nerita picea
	Neritid sp.
	Neritina granosa
	Neritina vespertina
Worms	*Namalycastis abiuma*
	Namalycastis sp.
	Oligochaete sp.
	Prostoma sp.

Native Species

Insects	*Anax junius*
	Empidid sp.
	Hemerodromia sp.
	Hydroptila sp.
	Limonia sp.
	Megalagrion hawaiiense
	Megalagrion leptodemas
	Megalagrion nigrohamatum nigrolineatum
	Megalagrion oceanicum
	Megalagrion sp.
	Orthocladius sp.
	Telmatogeton sp.

Introduced Species

Clams	*Corbicula fluminea*
Crustaceans	*Hyalella azteca*
	Isopod sp.
	Macrobrachium lar
	Neocaridina denticulata
	Procambarus clarkii
Fish	*Ancistrus cf. temminckii*
	Gambusia affinis
	Hemichromis elongatus
	Hypostomus watwata
	Poecilia reticulata
	Poecilia sphenops

Introduced Species

Insects	*Cheumatopsyche analis*
	Chironomid larvae
	Ischnura ramburi
	Trichoptera larvae

	Sarotherodon melanotheron
	Xiphophorus helleri
Snails	*Melanoides tuberculata*
	Physid sp.
	Pomacea bridgesii
	Pomacea canaliculata
	Tarebia granifera
	Thiarid sp.

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

Scientific Name	Status	Estuary	Lower	Middle	Upper	Headwaters
Macrobrachium grandimanus	Endemic	P	P			
Eleotris sandwicensis	Endemic		P			
Kuhlia xenura	Endemic		P			
Stenogobius hawaiiensis	Endemic		P			
Megalagrion hawaiiense	Endemic				P	
Megalagrion leptodemas	Endemic				P	
Megalagrion nigrohamatum nigrolineatum	Endemic				P	
Megalagrion oceanicum	Endemic				P	
Orthocladius sp.	Endemic	P				
Ferrissia sharpi	Endemic	P				
Neritina granosa	Endemic	P				
Amphipod sp.	Indigenous	P				
Awaous guamensis	Indigenous		P			
Limonia sp.	Indigenous	P				
Namalycastis sp.	Indigenous	P				
Corbicula fluminea	Introduced	P				
Macrobrachium lar	Introduced		P			
Neocaridina denticulata	Introduced	P				
Procambarus clarkii	Introduced	P	P			
Ancistrus cf. temminckii	Introduced		P			
Gambusia affinis	Introduced		P			
Hemichromis elongatus	Introduced		P			
Hypostomus watwata	Introduced		P			
Poecilia reticulata	Introduced		P			
Poecilia sphenops	Introduced		P			
Sarotherodon melanotheron	Introduced		P			
Xiphophorus helleri	Introduced		P			
Cheumatopsyche analis	Introduced	P				
Chironomid larvae	Introduced	P				
Ischnura ramburi	Introduced	P			P	
Trichoptera larvae	Introduced	P				

Melanoides tuberculata	Introduced	P	
Physid sp.	Introduced	P	
Pomacea canaliculata	Introduced		P
Tarebia granifera	Introduced	P	
Thiarid sp.	Introduced	P	
Ostracod sp.	Undetermined	P	
Empidid sp.	Undetermined	P	
Oligochaete sp.	Undetermined	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): Limited

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

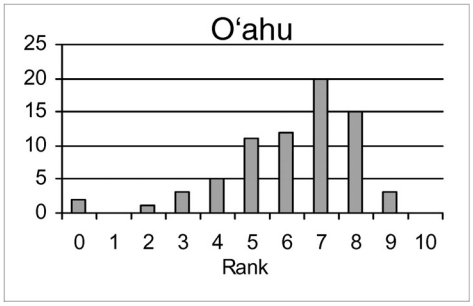
The current watershed and stream ratings are based on the data contained in the DAR Aquatic Surveys Database. The ratings provide the score for the individual watershed or stream, the distribution of ratings for that island, and the distribution of ratings statewide. This allows a better understanding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

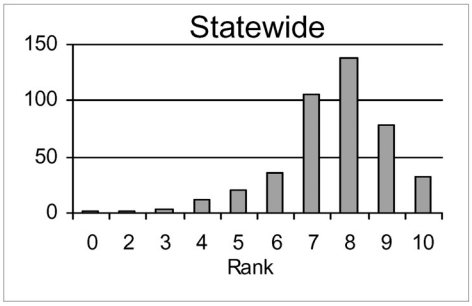
WATERSHED RATING: Nu‘uanu, O‘ahu

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

Watershed Rating

5

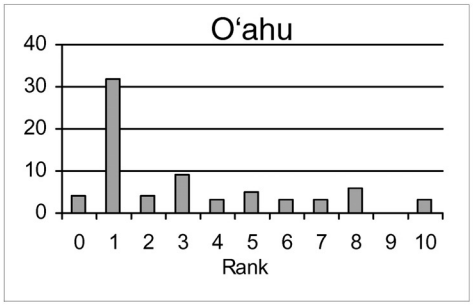


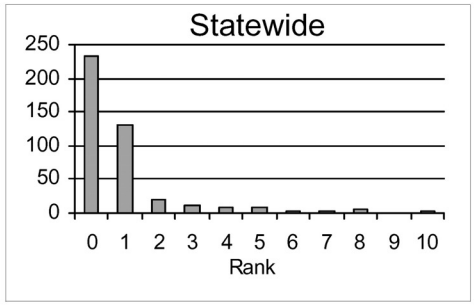


Shallow Waters Rating: Rating is based on a combination of the extent of estuarine and shallow marine areas associated with the watershed and stream.

Watershed Rating

5

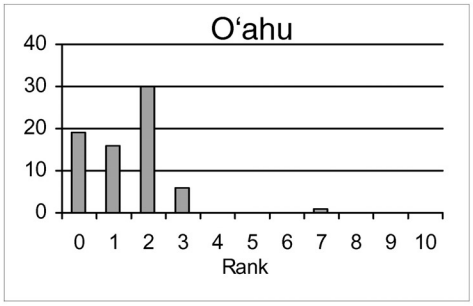


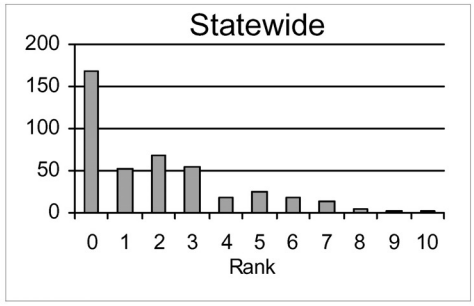


Stewardship Rating: Rating is based on a scoring system where higher levels of land and biodiversity protection within the watershed score positively.

Watershed Rating

2



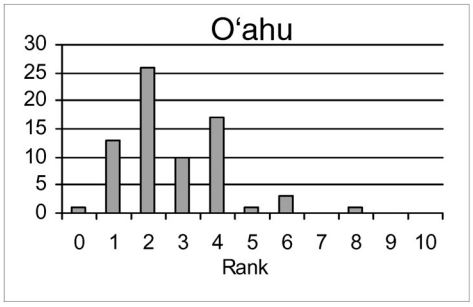


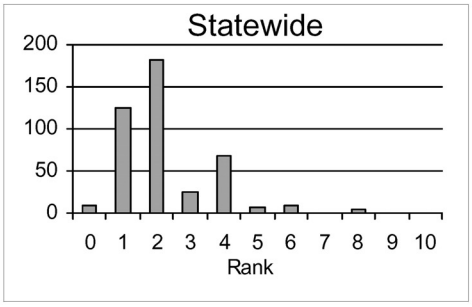
WATERSHED RATING (Cont): Nu‘uanu, O‘ahu

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

Watershed Rating

4

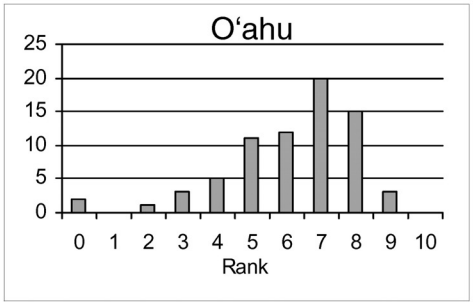


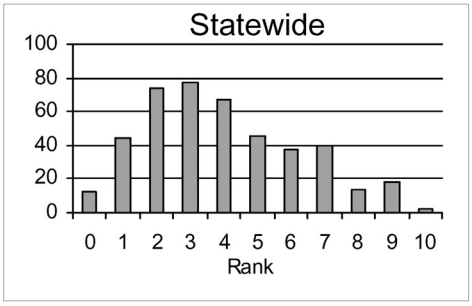


Wetness Rating: Rating is based on the average annual rainfall within the watershed. Higher rainfall totals score more positively.

Watershed Rating

4

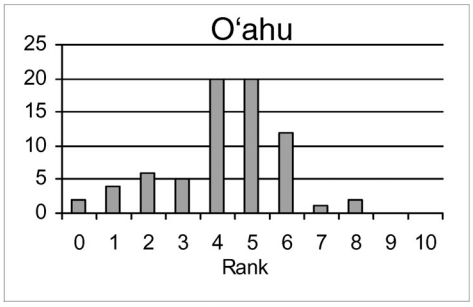


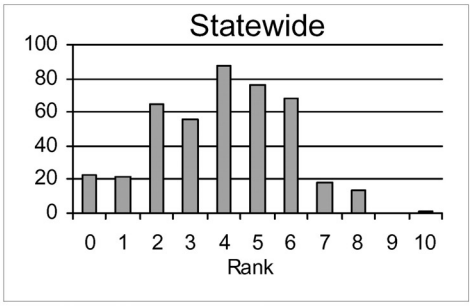


Reach Diversity Rating: Rating is based on the types and amounts of different stream reaches available in the watershed. More area in different reach types score more positively.

Watershed Rating

5

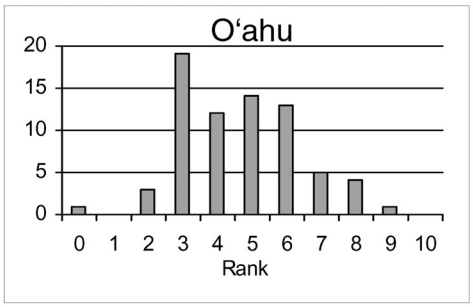


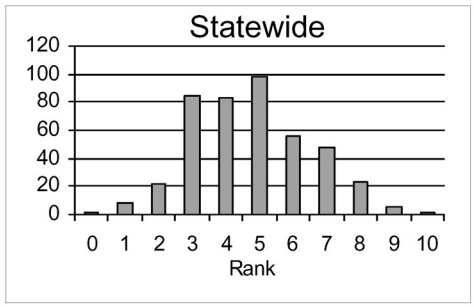


Total Watershed Rating: Rating is based on combination of Land Cover Rating, Shallow Waters Rating, Stewardship Rating, Size Rating, Wetness Rating, and Reach Diversity Rating.

Watershed Rating

6



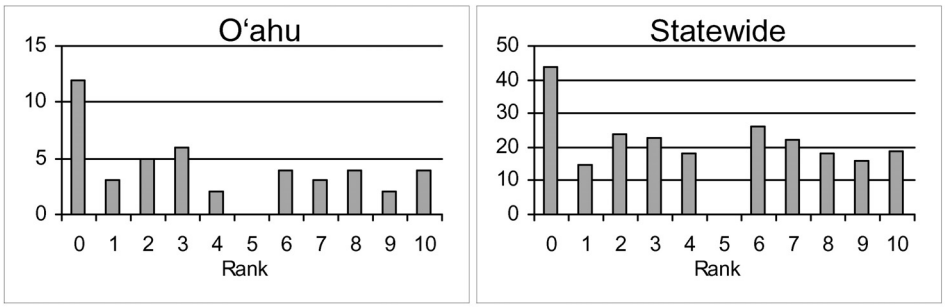


BIOLOGICAL RATING: Nu‘uanu, O‘ahu

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

Stream Rating

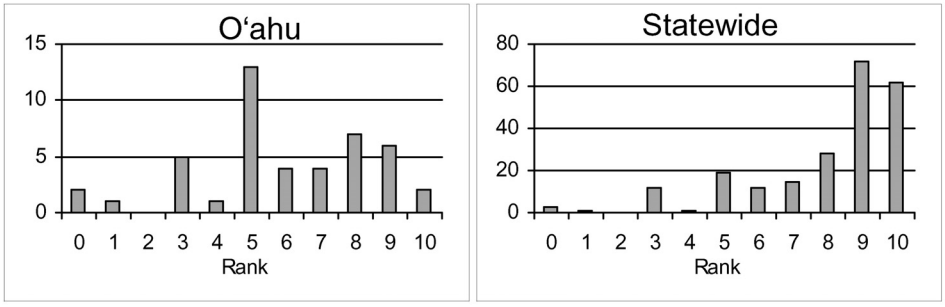
10



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

Stream Rating

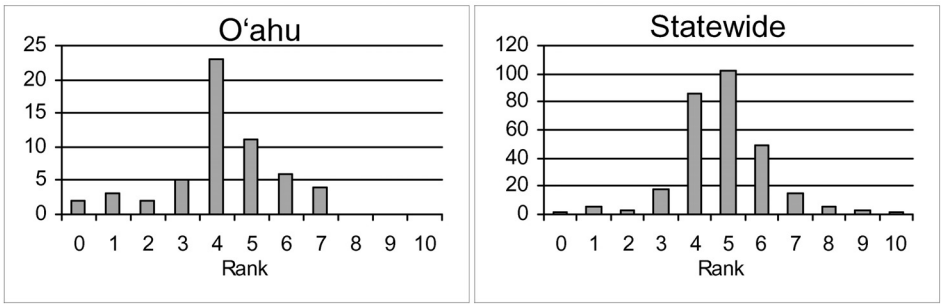
5



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

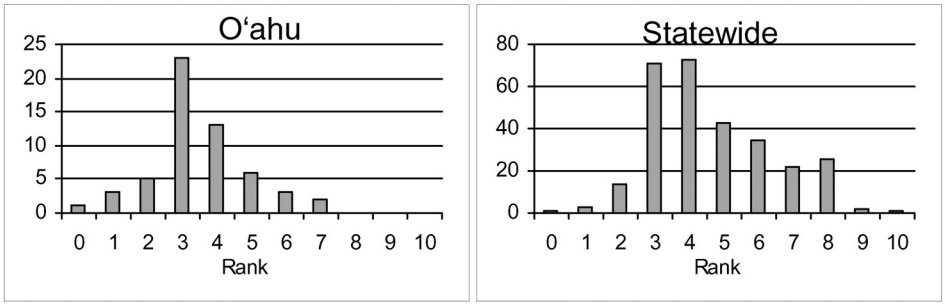
7



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

Stream Rating

7

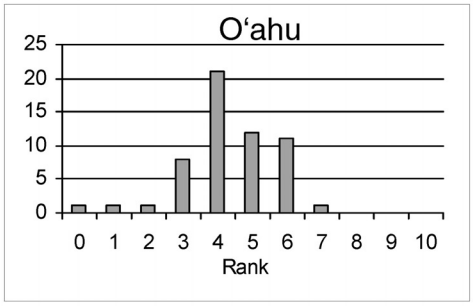


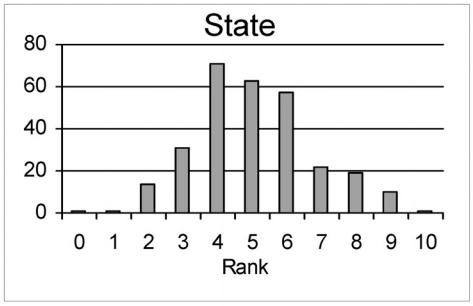
OVERALL RATING: Nu‘uanu, O‘ahu

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

Watershed Rating

7



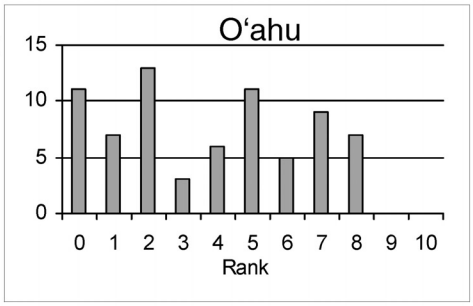


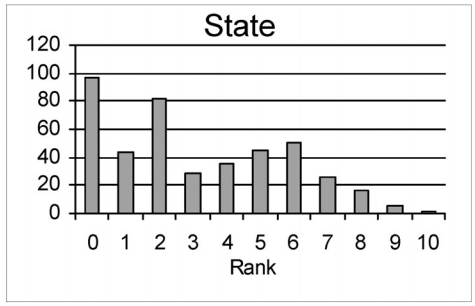
RATING STRENGTH: Nu‘uanu, O‘ahu

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

7





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