18270
Hawai'i Wet-Mesic Coastal Strand

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Vegetation Type
Shrubland

Map Zones
79

Geographic Range
This ecological system occurs along the coastline and the zone immediately back of it on the windward sides of the larger Hawai'ian Islands except Kaho'olawe and Lanai. Stands are restricted to seasonally mesic to wet shoreline and the zone immediately back of it.

Biophysical Site Description
Stands are restricted to seasonally mesic to wet shoreline and the zone immediately back of it. These are dry rocky, cobbly and talus shorelines, on the smaller islands and the leeward side of the larger islands that receive <1,200mm precipitation a year. Substrates are variable and include a mix of sand, cobble and/or bedrock. Elevation is generally below 30m. Annual precipitation ranges from more than 3,500mm to 1,200mm on seasonally mesic sites. Topography ranges from flat rocky beaches, dry alluvium, to talus and eroding weathered basalt slopes.

Vegetation Description
This habitat is driven by its proximity to the sea, with wind and salt spray and loose broken rocky and often unstable unconsolidated substrates. The vegetation is sparse to patchy. Native species that may be locally dominant include *Scaevola sericea*, *Myroporum sandwicense,* and others. Lower rocky shores above the waves but still within the reach of the spray may have a depressed scrub of *Scaevola taccada* and locally *Santalum elliptium,* with *Sesuvium portulacastrum* and *Fimbristylis cymosa* forming patches and tufts in bare areas. On slopes of tuff or disintegrating lava, *Jaquemontia ovalifolia*, *Sida fallax*, *Boerhavia acutifolia*, *B. repens,* and *Fimbristylis cymosa* are common.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
SCSE6	*Scaevola sericea*	Beach naupaka
PESA6	*Peucedanum sandwicense*	Makou
LIIN4	*Lipochaeta integrifolia*	Kure atoll nehe
SPVI3	*Sporobolus virginicus*	Seashore dropseed
MYSA	*Myoporum sandwicense*	Naio
SEPO2	*Sesuvium portulacastrum*	Shoreline seapurslane
JAOV2	*Jacquemontia ovalifolia*	Oval-leaf clustervine

LISU7	*Lipochaeta succulenta*	Seaside nehe

Species names are from the NRCS PLANTS database. Check species codes at http://plants.usda.gov.

Disturbance Description

Primary disturbances include landslides, wind, salt spray, storm surge (major disturbance), salt to soils. Storm surges can scour soil off to bare lava/rock (box A), or can partially remove/kill vegetation and leave the bit of soil, and hence have more rapid recovery of the vegetation (box B).

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement				
Moderate (Mixed)				
Low (Surface)				
All Fires				

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

Scale Description

This system forms a narrow linear zone along the coast; likely not able to be mapped for LANDFIRE.

Adjacency or Identification Concerns

Issues or Problems

Native Uncharacteristic Conditions

Comments

Succession Classes

Mapping Rules

Upper Layer Lifeform	Height (m)	Canopy Cover (%)									
		0-10	11-20	21-30	31-40	41 - 50	51-60	61-70	71-80	81-90	91-100
Herb	0-0.5	A	A	A	A	A	A	A	A	A	A
Herb	0.5-1.0	B	B	B	B	B	B	B	B	B	B
Herb	>1.0	B	B	B	B	B	B	B	B	B	B
Shrub	0-0.5	C	C	C	C	C	C	C	C	C	C
Shrub	0.5-1.0	C	C	C	C	C	C	C	C	C	C
Shrub	1.0-3.0	C	C	C	C	C	C	C	C	C	C
Shrub	>3.0	C	C	C	C	C	C	C	C	C	C
Tree	0-5	C	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	5-10	C	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	10-25	C	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	25-50	C	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	>50	C	UN	UN	UN	UN	UN	UN	UN	UN	UN

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

Description

Class A **5** **Early Development 1 - All Structures**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SCSE6	Scaevola sericea	Beach naupaka	Upper
IPPE	Ipomoea pes-caprae	Bayhops	Upper
FIDI	Fimbristylis dichotoma	Forked fimbry	Upper

Description

Post lava flow hitting the coast, veg is barren/sparse early successional.

Maximum Tree Size Class

None

Class B **15** **Mid Development 1 - Open**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
CAMO15	Canavalia molokaiensis	Molokai jackbean	Upper
LISU7	Lipochaeta succulenta	Seaside nehe	Upper
LYMA4	Lysimachia mauritiana	Spoonleaf yellow loosestrife	Upper

Description

Post lava flow hitting the coast, veg is barren/sparse early successional.

Maximum Tree Size Class

None

Class C **80** **Late Development 1 - Open**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PESA6	Peucedanum sandwicense	Makou	Upper
BIMO	Bidens molokaiensis	Molokai beggarticks	Upper
ISBY	Ischaemum byrone	Hilo murainagrass	Lower
FIDI	Fimbristylis dichotoma	Forked fimbry	Upper

Description
On all substrates sand, cobble, rock, etc. Vegetation is more developed but still open shrubby/herbaceous.

Maximum Tree Size Class
None

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:OPN	10
Mid1:OPN	11	Late1:OPN	20
Late1:OPN	21	Late1:OPN	999

Probabilistic Transitions

Disturbance Type	Disturbance occurs In	Moves vegetation to	Disturbance Probability	Return Interval (yrs)	Reset Age to New Class Start Age After Disturbance?	Years Since Last Disturbance
Optional 1	Early1:ALL	Early1:ALL	0.001	1000	No	0
Wind or Weather or Stress	Early1:ALL	Early1:ALL	0.05	20	No	0
Optional 1	Mid1:OPN	Early1:ALL	0.001	1000	Yes	0
Optional 2	Mid1:OPN	Mid1:OPN	0.004	250	No	0
Wind or Weather or Stress	Mid1:OPN	Mid1:OPN	0.01	100	No	0
Optional 1	Late1:OPN	Early1:ALL	0.001	1000	Yes	0
Optional 2	Late1:OPN	Mid1:OPN	0.004	250	Yes	0
Wind or Weather or Stress	Late1:OPN	Early1:ALL	0.005	200	Yes	0
Wind or Weather or Stress	Late1:OPN	Mid1:OPN	0.01	100	Yes	0

Optional Disturbances

Optional 1: Lava Flows
Optional 2: Landslides

References

Gagne, W.C., and L.W. Cuddihy. 1990. Vegetation. Pages 45-114 in: W.L. Wagner, D.R. Herbst, and S.H. Sohmer, editors. Manual of the Flowering Plants of Hawai'i. 2 Volumes. University of Hawaii Press, Honolulu.

Mueller-Dombois, D., and F.R. Fosberg. 1998. Vegetation of the tropical Pacific islands. Springer-Verlag, New York. 733 pp.

NatureServe. 2008. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: September 3, 2008).

Price, J.P., S.M. Gon III, J.D. Jacobi, and D. Matsuwaki. 2007. Mapping plant species ranges in the Hawaiian Islands: Developing a methodology and associated GIS layers. Hawai'i Cooperative Studies Unit. Technical Report HCSU-008. Pacific Aquaculture and Coastal Resources Center (PACRC), University of Hawai'i Hilo. 58 pp., includes 16 figures and 6 tables.

Wagner, W. L., D. R. Herbst, and S. H. Sohmer. 1999. Manual of the flowering plants of Hawaii. Revised edition. Volumes 1 and 2. University of Hawaii Press and Bishop Museum Press, Honolulu. 1919 pp.

Warshauer, F. R., J. D. Jacobi, and J. Price 2009. Native coastal flora and plant communities in Hawai‘i: Their composition, distribution, and status. Hawai‘i Cooperative Studies Unit Technical Report HCSU-014. University of Hawai'i at Hilo.

Western Ecology Working Group of NatureServe. No date. International Ecological Classification Standard: International Vegetation Classification. Terrestrial Vegetation. NatureServe, Boulder, CO.