18170
Hawai'i Lowland Dry Shrubland

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Vegetation Type
Shrubland

Map Zones
79

Geographic Range
This dry lowland forest ecological system occurs on the leeward side of all islands except Ni'ihau and Kaho'olawe.

Biophysical Site Description
Dry lowland shrublands occur mostly on leeward side of all the main islands between 10-1,000m in elevation. Generally less than two meters in height. Rain fall is 500-1,500mm, generally too dry to support forest or woodland, mostly restricted to the winter months, with summers hot and dry. Soils vary from silty loams to relatively unweathered ʻaʻā or pāhoehoe lava.

Vegetation Description
Vegetation consists of low shrubland dominated by *Dodonaea viscosa*, *Wikstroemia* spp., *Bidens* spp., *Sida fallax*, *Waltheria*, *Chamaesyce* spp., or *Sesbania tomentosa*. Stands often have other native shrubs such as *Gossypium*, *Hibiscus brackenridgei*, *Canthium odoratum*, *Capparis sandwichiana*, *Acyranthes* spp., *Nototrichium*, *Styphelia tameiameiae*, *Senna gaudichaudii*, *Canavalia* spp., *Cassytha filiforme*, *Argemone glauca*, *Peperomia tetraphylla*, and *P. leptostegia*, *Plectranthus australis*, *Lipochaeta* spp., *Portulacca* spp., *Santalum ellipticum*, *Abutilon* spp., *Sicyos* spp., *Ipomoea* spp., *Myoporum sandvicense*, ferns (*Doryopteris* and *Pellaea*), and also grasses such as *Heteropogon*, *Eragrostis*, *Panicum*. A few tree species (*Erythrina*, *Reynoldsia*, etc.) may be scattered in this type.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
DOVI	*Dodonaea viscosa*	Florida hopbush
WIKST	*Wikstroemia*	False ohelo
STTA	*Styphelia tameiameiae*	Pukiawe
WAIN	*Waltheria indica*	'uhaloa
HIBR	*Hibiscus brackenridgei*	Brackenridge's rosemallow
CAOD2	*Canthium odoratum*	Alahe'e
GOTO	*Gossypium tomentosum*	Hawai'i cotton
SIFA	*Sida fallax*	Yellow llima

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

Disturbance Description

The density and height of shrubs may be reduced by recent fire or increase with increased moisture, for example when near riparian areas. Lowland dry shrublands are relatively intolerant to grazing pressure and fire and are replaced by grasses or, in modern times, by alien-dominated communities when subject to these disturbances. Severe drought can favor grasses. Hawaiian burning to encourage *Heteropogon* could suppress shrubs in favor of grasses.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	81	15		
Moderate (Mixed)				
Low (Surface)	15	85		
All Fires	12	100		

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

Adjacency or Identification Concerns

This system forms mosaics with adjacent grasslands and lowland dry and mesic forest.

Issues or Problems

Native Uncharacteristic Conditions

Trees when present seldom, if ever, achieve more than 10% canopy closure.

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	C	C	C	C	C	C	C	C	C	C
Herb	0.5-1.0	C	C	C	C	C	C	C	C	C	C
Herb	>1.0	C	C	C	C	C	C	C	C	C	C
Shrub	0-0.5	A	A	A	B	B	B	B	B	B	B
Shrub	0.5-1.0	A	A	A	B	B	B	B	B	B	B
Shrub	1.0-3.0	A	A	A	B	B	B	D	D	D	D
Shrub	>3.0	A	A	A	B	B	B	D	D	D	D
Tree	0-5	D	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	5-10	D	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	10-25	D	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	25-50	D	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	>50	D	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 **3** **Early Development 1 - Open**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
HECO10	Heteropogon contortus	Tanglehead	Upper
WAIN	Waltheria indica	'uhaloa	Low-Mid
DOVI	Dodonaea viscosa	Florida hopbush	Upper
DORYO	Doryopteris	Doryopteris	Lower

Description

Barren lava/cinder/soil to early mixed grassland and shrubland in <30yrs.

Maximum Tree Size Class

None

Class B **11** **Mid Development 1 - Closed**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
DOVI	Dodonaea viscosa	Florida hopbush	Upper
SIFA	Sida fallax	Yellow llima	Upper
HECO10	Heteropogon contortus	Tanglehead	Upper
WAIN	Waltheria indica	'uhaloa	Low-Mid

Description

Shrubland with grasses subdominant.

Maximum Tree Size Class

None

Class C **35** **Mid Development 2 - Closed**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
HECO10	Heteropogon contortus	Tanglehead	Upper
DOVI	Dodonaea viscosa	Florida hopbush	Upper

Description

Disturbances in this class include lava flows. Other disturbances that affect this seral stage include surface fire.

Maximum Tree Size Class
None

Class D 51 Late Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
DOVI	Dodonaea viscosa	Florida hopbush	Upper
GOTO	Gossypium tomentosum	Hawai'i cotton	Upper
WIKST	Wikstroemia	False ohelo	Upper
OSAN	Osteomeles anthyllidifolia	Hawai'i hawthorne	Upper

Description
Shrubland, grasses infrequent.

Maximum Tree Size Class
None

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:OPN	0	Mid1:CLS	30
Mid2:CLS	1	Mid2:CLS	11
Mid1:CLS	31	Late1:CLS	40
Late1:CLS	41	Late1:CLS	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:OPN	Early1:OPN	0.001	1000	No	0
Optional 1	Mid1:CLS	Early1:OPN	0.001	1000	Yes	0
Replacement Fire	Mid1:CLS	Mid2:CLS	0.02	50	Yes	0
Alternative Succession	Mid2:CLS	Mid1:CLS	1	1	Yes	9
Optional 1	Mid2:CLS	Early1:OPN	0.001	1000	Yes	0
Surface Fire	Mid2:CLS	Mid2:CLS	0.2	5	No	0
Optional 1	Late1:CLS	Early1:OPN	0.001	1000	Yes	0
Replacement Fire	Late1:CLS	Mid2:CLS	0.02	50	Yes	0

Optional Disturbances

Optional 1: Lava Flows

References

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