18110

Hawai'i Wet Cliff and Ridge Crest Shrubland

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Shrubland

Map Zones

79

Geographic Range

This system occurs between 200-900m (650-2,950ft) elevation on Kaua'i, O'ahu, Moloka'i, Lana'i, Maui, and Hawai'i.

Biophysical Site Description

This system occupies crests of steep ridges and cliff faces throughout the main Hawai'ian Islands. These environments are characterized by regularly windy and usually foggy and wet conditions. Soils are generally thin over soft, highly weathered rock and thin mucky clays.

Vegetation Description

Vegetation is windswept and variable, ranging from dense dwarf shrublands, to dominant sedges with few scattered shrubs, to sparse rock with very little plant life. Dwarf-shrubs are 1-3m in height, are clothed with masses of epiphytic cryptogams, and have a diverse array of native shrubs, vines, herbs and ferns. Woody plants become so stunted in some sites that sedges and ferns form a continuous canopy with them. Dominant species vary according to island and abiotic factors but may include wind-stunted *Metrosideros*, *Cibotium*, *Melicope*, *Myrsine*, and *Vaccinium*. Other species include *Asplenium* spp., *Astelia menziesiana*, *Bidens* spp., *Broussaisia arguta*, *Cyrtandra* spp., *Diplopterygium pinnatum*, *Dicranopteris linearis*, *Dubautia* spp., *Eurya sandwicensis*, *Freycinetia arborea*, *Hedyotis terminalis*, *Lycopodiella cernua*, *Lobelia* spp., *Machaerina angustifolia*, *Peperomia* spp., *Phyllostegia* spp., *Scaevola* spp., *Sadleria pallida*, *Sadleria squarosa*, *Tetraplasandra* spp., *Trematolobelia* spp., and several rare endemic species.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| MEPO5 | *Metrosideros polymorpha* | 'ohi'a lehua |
| BRAR6 | *Broussaisia arguta* | Kanawao |
| GUPE | *Gunnera petaloidea* | Haha |
| DIPI3 | *Diplopterygium pinnatum* | Scrambling fern |
| DILI | *Dicranopteris linearis* | Old world forkedfern |
| VARE | *Vaccinium reticulatum* | Ohelo 'ai |
| FRAR | *Freycinetia arborea* | 'ie'ie |
| HETE21 | *Hedyotis terminalis* | Variable starviolet |

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

Disturbance Description

Landslides occur occasionally in this system, uncovering bare mineral soils, which are colonized by pioneer species such as *Metrosideros*, *Dicranopteris*, and other ruderal natives.

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

Adjacency or Identification Concerns

Adjacent to montane cloud forest, montane rainforest, and lowland rainforest.

Issues or Problems

Native Uncharacteristic Conditions

Comments

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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 | A | A | A | A | A | A | A | A | A | A |
| Herb | >1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0-0.5 | A | A | A | A | B | B | B | C | C | C |
| Shrub | 0.5-1.0 | B | B | B | B | B | B | B | C | C | C |
| Shrub | 1.0-3.0 | B | B | B | B | B | B | B | C | C | C |
| Shrub | >3.0 | B | B | B | B | B | B | B | C | C | C |
| Tree | 0-5 | B | B | B | B | B | B | B | C | C | C |
| Tree | 5-10 | B | B | B | B | B | B | B | C | C | C |
| Tree | 10-25 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | >50 | UN | 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 8 Early Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| MEPO5 | Metrosideros polymorpha | 'ohi'a lehua | Upper |
| DILI | Dicranopteris linearis | Old world forkedfern | Upper |

Description

Fresh landscape scar with pioneer wet cliff vegetation such as *Dicranopteris*, *Metrosideros* seedlings and saplings, and a variety of other ruderal ferns, herbs and shrubs. Starting at the minimum cover of 10%, it would take 25-50yrs to achieve a closed shrub canopy that builds in diversity over time.

*Maximum Tree Size Class*  
None

Class B 16 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| DILI | Dicranopteris linearis | Old world forkedfern | Upper |
| MEPO5 | Metrosideros polymorpha | 'ohi'a lehua | Upper |
| ODCH | Odontosoria chinensis | Chinese creepingfern | Upper |

Description

This is the *Dicranopteris*-dominated phase of pioneer revegetation of landslide scars, and includes most of the species of the uluhe phase of lowland rainforest. Various lichens, mosses and liverworts cover the areas not yet covered by vascular plants. Within 15-40yrs, the climax mixed fern and shrub ecosystem structure and composition is reached.

*Maximum Tree Size Class*  
None

Class C 76 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| MEPO5 | Metrosideros polymorpha | 'ohi'a lehua | Upper |
| DILI | Dicranopteris linearis | Old world forkedfern | Upper |
| VARE | Vaccinium reticulatum | Ohelo 'ai | Upper |
| CIGL | Cibotium glaucum | Hapu'u | Upper |

Description

The climax mix of dense ferns, shrubs, and wind-stunted trees includes dwarf-shrubs 1-3m in height, clothed with masses of epiphytic cryptogams and a diverse array of native shrubs, vines, herbs, and ferns. Dominant species vary according to island and abiotic factors but may include wind-stunted *Metrosideros*, *Cibotium*, *Melicope*, *Myrsine*, and *Vaccinium*. Other species include *Asplenium* spp., *Astelia menziesiana*, *Bidens* spp., *Broussaisia arguta*, *Cyrtandra* spp., *Diplopterygium pinnatum*, *Dicranopteris linearis*, *Dubautia* spp., *Eurya sandwicensis*, *Freycinetia arborea*, *Gunnera* sp., *Hedyotis terminalis*, *Lobelia* spp., *Lycopodiella cernua*, *Trematolobelia* spp., *Machaerina angustifolia*, *Myrsine* spp., *Peperomia* spp., *Phyllostegia* spp., *Scaevola* spp., *Sadleria pallida*, *Styphelia tameiameiae*, *Tetraplasandra* spp., *Trematolobelia* spp., and several rare endemic species.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:OPN | 0 | Mid1:CLS | 10 |
| Mid1:CLS | 11 | Late1:CLS | 30 |
| Late1:CLS | 31 | 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 | 0.004 | 250 | No | 0 |
| Optional 1 | Mid1:CLS | Early1:OPN | 0.004 | 250 | Yes | 0 |
| Optional 1 | Late1:CLS | Early1:OPN | 0.01 | 100 | Yes | 0 |

Optional Disturbances

Optional 1: landslide

References

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