The Role of Botanic Gardens in Biocultural Conservation: A new conservation imperative

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Our Mission

Cultivation
Conservation
Education
Gardens as living museums
Bioswale Garden
Victoria lily

Amorphophallus foetidus
Climate Change and Garden(ing)
Plant hardiness zones

From: Marris, 2007
Flowering dates of *Narcissus pseudonarcissus*

- **March**: 9 Mar, 3 Mar
- **February**: 13 Feb, 12 Feb, 11 Feb
- **January**: 27 Jan

From: Royal Botanic Gardens, Kew (2006)
Extinction Risks

• 15-30% of all species “committed to extinction” by 2050, worldwide

• For plants:
  - Amazonia 53-87%
  - Cerrado 40-50%
  - S. African Proteaceae 24-34%
  - Europe 4-17%

<table>
<thead>
<tr>
<th>Category</th>
<th>Critical</th>
<th>Endangered</th>
<th>Vulnerable</th>
<th>Extant</th>
<th>%CEV</th>
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<tr>
<td>Birds</td>
<td>182</td>
<td>321</td>
<td>680</td>
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<td>610</td>
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<td>Languages</td>
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<td>506</td>
<td>732</td>
<td>6809</td>
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</table>

Language Endangerment

6900 extant languages

50% endangered

Losing one language every 2 weeks (long-term trend)

Source: UNESCO
Language Extinction Hotspots

Enduring Voices Saving Disappearing Languages

Language Hotspots

These areas have a high number of languages in danger of extinction.

THREAT LEVEL
- SEVERE
- HIGH
- MEDIUM
- LOW

Click on a highlighted area to learn more.

Source: Living Tongues Institute for Endangered Languages
Extinction of culture and/or language results in lost:

IEK about plants, animals, etc.

art, music, dance

perceptions of time and nature
Culturally Significant Plants in Hawaiʻi

ʻōhia lehua
Metrosideros polymorpha

koʻa
Acacia koa

kalo (taro)
Colocasia esculenta
Preserving Biocultural Diversity

Taro
sacred and linked to identity and ancestry

Vanua Lava
“we do not cultivate taro to live, but live to cultivate taro “

Republic of Kiribati:
32 flat coral atolls (1.5 – 2m elevation)
1,350,000 square miles of ocean
Kiribati

Negotiating to buy up to 5000 acres in Fiji

A flooded road in Tebikenikoora on South Tarawa (national capital)

Once surrounded by trees, this small village now lies unprotected

Photos by Ciril Jazbec
The Iñupiat of northern Alaska

Climate change is pushing whales further north.

Environmental shifts threatening the culture's fundamental roots.
Hotspots of Biocultural Diversity

Cyanea truncata in tissue culture
Lyon Arboretum, University of Hawai‘i
Extinct in the wild
“Diversity is a way of coping with the possible. It acts as a kind of insurance for the future.

In humans, natural diversity is further strengthened by cultural diversity.”

François Jacob, *The Possible and the Actual* (1982)

Nobel Prize in Medicine, 1965
Article 8j:

respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities … for the conservation and sustainable use of biological diversity
Target 13:

Halt the decline of plant resources, and associated indigenous and local knowledge, innovations and practices.
Royal Botanic Garden of Jordan

HRH Princess Basma bin Ali
International Partnerships and Capacity Building
Welina Mānoa

Mānoa is a genus of orchids, similar to paphiopedilums, that grows around the island. The orchids are native to the area and are found in a variety of habitats, from forested areas to rocky cliffs. The orchids are known for their beautiful colors and unique shapes. The Mānoa is a rare and endangered species, and efforts are being made to protect and conserve it.

1. Lyon Arboretum

Lyon Arboretum is a tropical rainforest botanical garden located in Honolulu. It is home to a diverse collection of plants from around the world. The arboretum offers guided tours and educational programs for visitors of all ages.

2. Mānoa Heritage Center

Mānoa Heritage Center is a cultural and natural history museum located in Honolulu. It features exhibits on Hawaiian culture, history, and natural history. The center also offers educational programs for visitors.

3. Ka Papa Lo'i o Kānewa

Ka Papa Lo'i o Kānewa is a research center located in Honolulu. It focuses on the study of Hawaiian culture and history. The center offers educational programs and research opportunities for visitors.

4. Waikiki Aquarium

Waikiki Aquarium is a marine-life aquarium located in Honolulu. It features a wide variety of marine animals and exhibits. The aquarium offers educational programs and guided tours for visitors of all ages.
‘Aina

‘Aina is the land or earth. The root word of ‘āina is ‘ā, which means to eat, so ‘āina can refer to how the land feeds us. By caring for the land, we care for ourselves; we must respect the land and its resources so that we do not harm our environment or take more than what is needed. This is important to maintain ecological balance and sustain ‘āina. It is our kuleana to malama the ‘āina.

Plant Usage Symbols

- Plants used for medicine and healing
- Plants used for food
- Plants used for canoe building
- Plants used for clothing and the making of kapa
- Plants used for fishing
- Plants used for canoe and canoe decoration
- Plants used for the construction of hale and other buildings
Help Pʻinao find these plants!

As you walk down the path where the Native Hawaiian plants grow, see if you can spot the plants that Pʻinao has pointed out. Gently and carefully touch, smell, look, and listen as you explore each plant.

**ʻUlu** – The ʻulu, or breadfruit, is a tree whose fruits are used for food. The wood of the ʻulu tree is used for surfboards, medicine, and poi pounding boards.

**ʻOhiʻa lehua** – The ʻōhiʻa lehua is a tree endemic to Hawaiian islands. Its hard wood is used for poles in house building, caning, and canoe building and its flowers are used for lei. Lehua flowers come in a number of colors including red, pink, yellow, orange and white.

**Hau** – The hau is a lowland tree that comes from the hibiscus family. In olden times, its wood was used for outriggers for canoes, its bast fiber was used for rope and its sap and flowers were used for medicine.

**Kalo** – Kalo, or taro, is the staple food of Hawai`i from ancient times. The cooked taro is pounded to make poi. There are numerous varieties of kalo plant, and each part of the plant can be used for food.

**Hala** – Hala, or pandanus, is a tree whose leaves are used to weave mats, hats, bags and other accessories. The fruits of the hala are used for food and brushes, and other parts of the plant are used for medicine.

**ʻOhiʻa ai** – The ʻōhiʻa ai, or mountain apple, is a tropical tree that often grows wild and is commonly found in shady mountain valleys. Various parts of the ʻōhiʻa ai were used traditionally: the strong wood from the trunk was used in house-building, roots and bark were used for dyes, and leaves and bark were used in various ways for medicinal purposes.

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**Moʻolelo**

The back of Manoa Valley is famous for the waiʻa, the rain water. The misty area near the mountain is called Kauao. When the usual begins to move with the Haukani wind, it is called the Tuzine rain. This waiʻa fills the waterfalls throughout the valley and also feeds the plants that grow in the valley.

Long ago, when only Hawaiians lived in Hawaiʻi, they farmed kalo throughout the valley and the waiʻa was very important for the life of the ʻIoʻi kalo. The waiʻa also helped to feed the Hawaiian forests in the area, with trees like koa, ʻōhiʻa, and ʻihli. But later, foreigners allowed cattle to run through Manoa and the cattle stomped on all the baby Hawaiian plants so they couldn’t grow tall. With no trees or loʻi anymore, the waiʻa couldn’t be absorbed back into the earth.

Big trees were planted to catch the waiʻa so that it could trickle back into the ground. But these big trees took over the valley and no Hawaiian plants could be grown.

Today, people are removing the big invasive trees and re-planting Hawaiian plants in Manoa, which help to capture the waiʻa and also are useful in many different ways. Let’s go find some of these plants!
“The kids here, they get to work in the lo‘i. They get to pull taro, pound it, make poi, eat it...we have Hawaiian games...we like to use a lot of the Hawaiian values...malama āina (care for land), lōkahi (harmony), and we do teach about the ahupua‘a...[so] we’re quite immersed in Hawaiian things” (Environmental educator, personal communication, July 19, 2012).
The Tree of the Great Long Leaves

**Eagle:** Sits atop of the tree, chosen for its superior vision to watch for the signs of aggression and unhealthy mind.

**Pine Cone:** Model for leadership: Male chiefs and female clanmothers.

**Branches:** Spread outwards to provide shade/shelter for those individual and nations seeking protection under the message of peace.

**Needles:** A symbol of the union between the original Five Nations (Mohawks, Oneidas, Onondagas, Cayugas and Senecas).

**Trunk:** A symbol of confederacy chiefs as they support the nations and individuals; as well as a symbol of singlemindedness or unanimity.

**Roots:** Four white roots of peace spreading in four directions towards other nations and individuals sharing or willing to accept the message of peace.

**Uprooting:** To bury the weapons of war underneath the tree and allow the stream below to take them away from future generations.

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One touch of nature makes the whole world kin
— William Shakespeare (Troilus & Cressida)