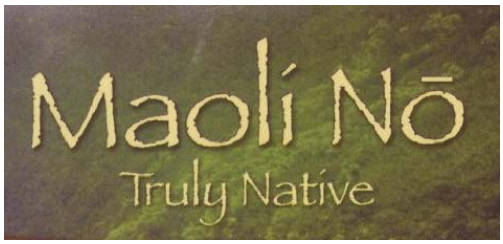


The Many Aspects of the Ahupuaʻa

Lesson Plan for Grades 9-12

Focus Questions
What are the various aspects of an ahupuaʻa, in the physical, cultural, as well as spiritual realms? Why might it be important to understand the ahupuaʻa in these ways?

Lesson at a Glance
Four activities are designed to help students learn about the natural environment of a selected ahupuaʻa. Students will look at Hawaiian vegetation zones, the prominent land features and place names for winds or rains to better understand the Hawaiian cultural perspective of "place" and compare these descriptions to geography's classifications of climate and terrestrial ecosystems. Students will study the forest and water resources of their ahupuaʻa and blend indigenous and modern ideas to describe their home.

Key Concepts
- Ahupuaʻa
- Hawaiian divisions of the land by altitude and vegetation cover
- Contemporary environmental issues including introduced and endangered species
- Basic geography and climatology
- Hawaiian place names

Objectives
Students will be able to:
- Define early Hawaiian and modern classification zones for vegetation and climate
- Define scientific and Hawaiian concepts related to wind and rain
- Develop maps of the ahupuaʻa in which the school is located
- Match native organisms to the zones in which they would be found
- Describe the ahupuaʻa in which the school is located using vegetation zones, names of winds and rain, names of streams, and names of native organisms,
- Compare how early Hawaiians and modern society in Hawaiʻi have managed their watersheds
- Produce a project that synthesizes what they learned about their ahupuaʻa

Subject Areas
Geography, Hawaiian Studies

Time
4-6 classes, plus homework assignments

Materials
- *Maoli Nō* DVD
- DVD player
- Atlases or topographic island maps with physical and environmental themes
- Climate and vegetation data, if available
- Historical maps and literature, if available
- Aerial photos of your region, if available
- Hawaiian literature sources (i.e.Hawaiian Dictionary, Place Names of Hawaii, the Atlas of Hawaii Olelo Noeʻau)
- Internet Access

Teacher Background
The amount and quality of land available in the Pacific varies a great deal, from high islands to low coral atolls. This geography project looks at modern and traditional Hawaiian descriptions of land use, vegetation, wind, rain, and freshwater resources. The subtlety and richness of the Hawaiian cultural perspective is revealed and enhances geography's idea of location and place.

Standards Met
State of Hawaiʻi Social Studies Standards:
Standard 6: Cultural Anthropology: SYSTEMS, DYNAMICS, AND INQUIRY-Understand culture as a system of beliefs, knowledge, and practices shared by a group and understand how cultural systems change over time.
Standard 7: Geography: WORLD IN SPATIAL TERMS-Use geographic representations to organize, analyze, and present information on people, places, and environments and understand the nature and interaction of geographic regions and societies around the world.

Assessment:
Technology Skills – using technology as a tool for research and productivity**—** Students use technology (internet) to locate, evaluate, and collect information from a variety of sources. Students use productivity tools to collaborate in preparing publications, and producing other creative works.

Using the tools of a geographer – Selects and shows useful geographic information and representations (maps) from a variety of sources; analyzes information, draws inferences, formulates valid generalizations.

The ability to communicate effectively – Short essays in each activity is done after research and demonstrates the ability to construct meaning and communicate effectively for a variety of purposes and audiences.

The ability to recognize and produce quality performance and quality products – The culminating project is a visual-media project. (PowerPoint, webpage or exhibit board)

Procedure

Activity 1: Land

1. Introduce students to modern classifications for vegetation and climate found in common world atlases (i.e. Koppen Climate Classification).

2. Now introduce students to the Hawaiian vegetation zones: kuahiwi, kuamauna, kuahea, wao nahele, wao maʻukele, wao akua, wao kanaka, ʻapaʻa, ilima, pahe`e, kula uka, kula waena, kula kai, kahakai
(Reference http://www.kumupono.com/land.htm)

3. Play the *Maoli Nō* DVD, Interlude #2 "*The Ahupuaʻa.*

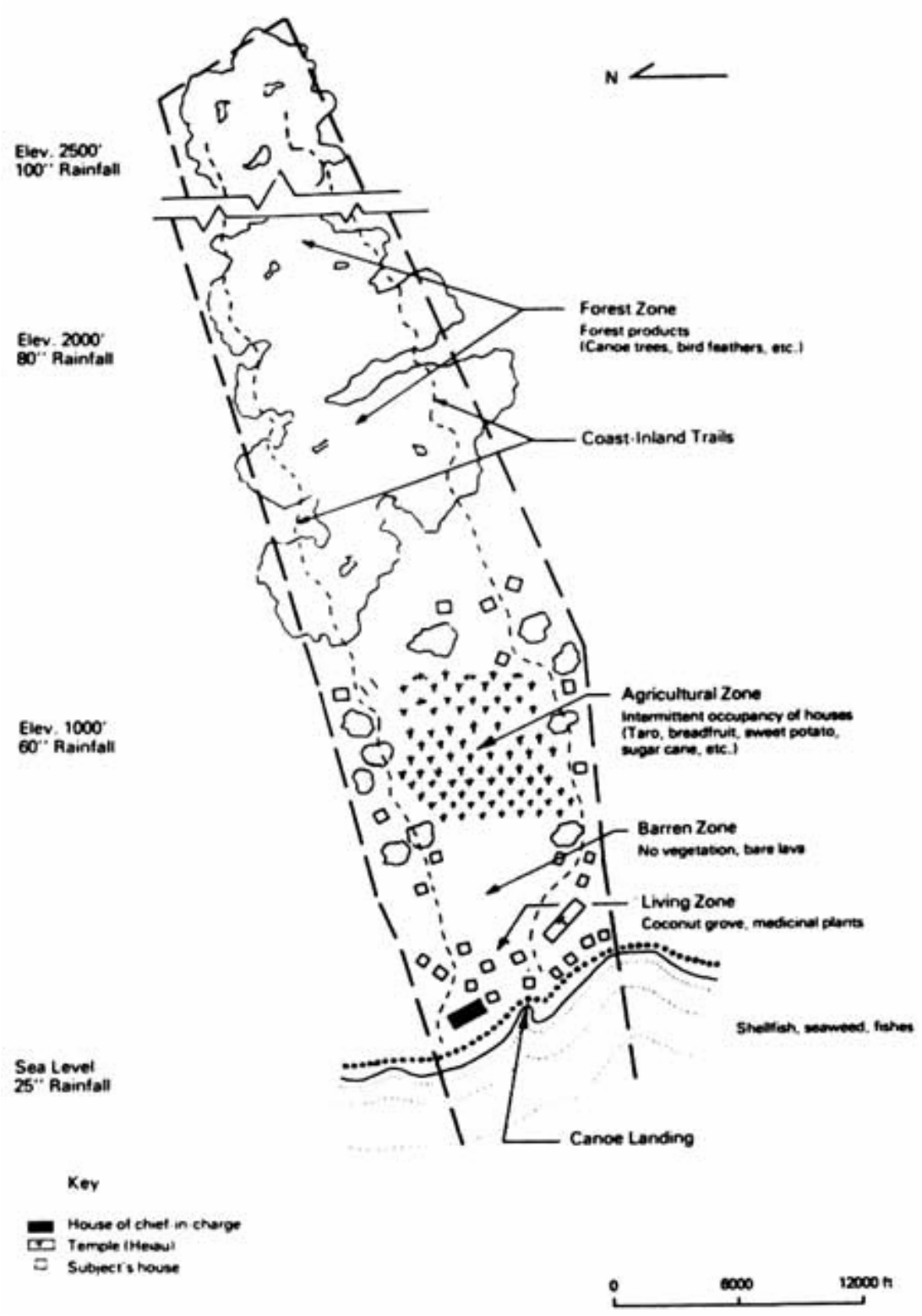
   "Ancient Hawaiian life was based around the ahupuaʻa system of land management, which evolved to protect the upland water resources that sustained human life. A typical ahupuaʻa, or land division, was wedge-shaped and extended from the mountains to the sea. As water flowed from the upland forest, down through the ahupuaʻa, it passed from the wao akua, the realm of the gods, to the wao kanaka, the realm of humans, where it sustained agriculture, aquaculture, and other human uses. Water was a gift from the gods, and all Hawaiians took an active part in its use and conservation."

4. Show students an aerial photo or map of the ahupuaʻa in which your school resides. Ask students to identify as many places names as possible from several map sources. List them and find the best possible definition(s) for all Hawaiian place names.

5. For homework, have students draw boundaries and label where they believe are the primary vegetation zones in the ahupuaʻa, using modern and Hawaiian land classifications. Ask students to write a general description of this area using both classification systems and have them answer the question: How do the place names reveal the Hawaiian cultural perspectives on the environment of your ahupuaʻa?

Maoli Nō - Geography Lesson

Use this diagram as a sample to assist students to determine (on one of their own maps) the vegetation land zones of their own ahupua'a. Take note of the *elevation* and *rainfall* on the left side of the diagram.



Example List for Kapahulu
Pālolo Valley to the Sea, Kona ahupuaʻa, Oʻahu

- Kaʻau Crater
- Kapahulu - worn out soil
- Kaimuki - the ki oven; Menehune cooked here. It is actually a small shield volcano
- Kaimana - diamond
- Kapa o Lono
- Kālai O Pōhaku
- Leʻahi/Laeʻahi- (now called Diamond Head) is erroneously spelled Leiahi [or Leahi]." [Lae is a promontory or headland; ʻahi is the yellow-fin tuna.] "Great schools of ʻahi were formerly found about this cape. Another explanation is that the promontory resembles the head of an ʻahi fish"
- Maunalani ridge
- Pālolo- clay; hard, sticky mud
- Pūkele Stream
- Waikīkī- spouting freshwater; during heavy rains, the 3 streams would flood and cause spouting from subterranean sources.
- Waʻahila Ridge

Activity 2: Winds and Rain

1. Introduce students to the climate of the Hawaiian Islands, including the concepts of predominant trade wind weather, orographic rainfall, rain shadow, land/sea breeze, leeward and windward.

2. Ask students whether the land division in which the school is located is considered "windward" or "leeward". Have them describe the predominant wind direction for your area.

3. From climatic data or rainfall maps, have students estimate the annual rainfall in your area. Ask them to describe how the rainfall changes as one goes inland from the coast and from different times of year.

4. Play the song "Waika" on the *Maoli Nō* DVD and ask students to note aspects of climate in the video. Go over the lyrics and take note of the names of the wind, plants, etc. in the song.

5. Now play Interlude #5: *"The Hawaiian Relationship to Nature"* on the *Maoli Nō* DVD.

   "Ancient Hawaiians believed they were direct kin of the plants and animals that shared their world, and that both animate and inanimate things possessed spiritual power, or mana. They believed that beings with great mana could take on the form of other plants and animals, and that one's spirit might cycle through other living things after human death. In such a world, you could talk directly to the winds and rains and expect a response, or have as your ancestral guardian the ʻio, or Hawaiian hawk, watching over you from his perch in the forest. As the youngest descendents among living family, humans had the role of caretakers, while the plants and animals, as the older siblings of the ʻāina, provided guidance. The saying goes: Healiʻi nō ka ʻāina, he kauwā wale ke kanaka. The land is chief, the human is but a servant."

6. For homework, have students research how the early Hawaiians described the winds or wind directions and rains in your ahupuaʻa. Ask them to provide proverbs, stories, songs, and/or sayings regarding the wind or rain in your area.

Example
List of Winds
Kona Ahupuaʻa, Oʻahu
http://apdl.kcc.hawaii.edu/~oahu/stories/winds.htm

Puʻuokona is of Kuliʻouʻou,

Ma-ua is the wind of Niu,

Holouha is of Kekaha,

Māunuunu is of Wai'alae,

The wind of Leʻahi turns here and there,

'Ōlauniu is of Kahaloa,

Waiʻōmaʻo is of Pālolo,

Kuehu-lepo is of Kahua,

Kūkalahale is of Honolulu,

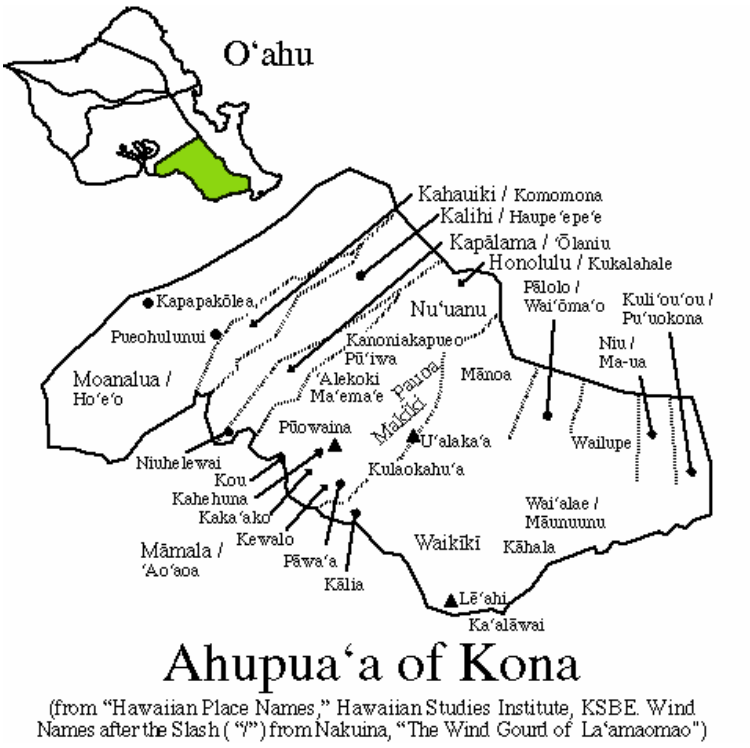
ʻAoʻaoa is of Mamala,

ʻŌlauniu is of Kapālama,

Haupeʻepeʻe is of Kalihi,

Kō-momona is of Kahauiki,

Hoʻeʻo is of Moanalua



Ahupuaʻa of Kona

(from "Hawaiian Place Names," Hawaiian Studies Institute, KSBE. Wind Names after the Slash ("/") from Nakuina, "The Wind Gourd of La'amaomao")

Activity 3: The Forest

1. Have students review the Hawaiian vegetation zones of your area, referring to the maps that they developed earlier.

2. Play the *Maoli Nō* DVD, interlude # 1: *In the Forest Reside the Gods.*
   "The ancient Hawaiians recognized gods everywhere in nature and honored a pantheon of natural deities. The upland forest was wao akua, the realm of the gods, and trees were physical manifestations of various gods in this spiritual realm. Entry into the forest was limited to a few consecrated individuals and involved a strict protocol, including a statement of identity and purpose and appropriate offerings. If the purpose was to collect trees, only a single tree or species could be collected at a time. The upland forest was sacred to Kū, the god of war, governance, and leadership. ʻŌhiʻa lehua was the physical manifestation of Kū, and the taking of a large ʻōhiʻa was regarded as a sacred action, requiring the most significant offerings."

3. Ask students to think about conservation ethics and "right" behaviors when interacting with nature. How do these ethics compare to Hawaiian values and traditions as to how one should behave while in the forest? Compare these attitudes and practices with the outdoor ethics program used at most national parks known as "Leave No Trace." (see Resources section)

4. Now focus student attention on what Hawaii's native forests have to offer. Play the *Maoli Nō* DVD, interlude #4 – *A Storehouse of Biological Riches.*

   "Charles Darwin never made it to Hawai'i, but other naturalists who did documented its astonishing natural diversity. From sun-baked coasts to snow-capped summits, Hawai'i is an evolutionary wonder, and its native forests a storehouse of biological riches. Biologists today are still cataloguing what lives in the Islands' native forests, but already they have described a litany of wonders: happy-face spiders and carnivorous caterpillars; giant, flowering lobelioids and brilliantly hued song birds – even a remarkable native fish whose powerful pelvic fins allows it to scale thousand-foot waterfalls. Hawai'i is home to over 10,000 native species, more than 90% of which are found nowhere else in the world. Science calls this phenomenon endemism, when species naturally occur in only one place. High rates of endemism signify biologically unique regions. With more endemic species than any place of similar size on Earth, Hawai'i is biologically rich, and its native forests are globally important."

5. Discuss students' interpretation of what they just heard. Have they seen any of the things that were talked about – in real life? Discuss the meaning of endemism and why Hawai'i has such a high rate.

6. Ask students to identify native plants that would have been found in the *mauka* region of your area. Match your environmental conditions to native species most likely to thrive in that kind of environment. Identify forest resources that were likely used by the early Hawaiians. Go to the website by Dr. Gerald Carr for information on native plants (see Resources section).

7. Now play the *Maoli Nō* DVD, interlude #3 – *The Extinction Crisis*.

   "Hawai'i has the dubious distinction of being home to more than one-third of the birds and plants on the U.S. Endangered Species List. When spiders, snails, and insects are included, nearly 60% of Hawaii's total native flora and fauna is imperiled, by far the highest percentage of any state. Destruction and the loss of forest habitat is the primary cause of species decline. If we are to preserve our remaining native forests and prevent further species loss, we must halt the continuing invasion of non-native plants and animals that is undermining the ecological stability of our Islands."

8. Play the song, "Ke Ho'olono Nei" on the DVD. It talks about three native Hawaiian birds in different stages of threat or extinction. Discuss the meaning of the song using the song notes as a guide.

9. Talk about how the forest has changed in your area as well as in other areas on your island, and on other islands in Hawaii. What has caused those changes? What are the consequences of those changes?

10. As a research and writing project, ask students to use Internet sources, printed publications, and interviews to research the following questions. What types of native birds, insects, plants, and ocean organisms were once common to your area and how they were used by the early Hawaiians? What is the current status of these native species? Identify some endangered species and invasive species in your area and discuss any policies or programs to address these issues.

Activity 4: Watershed and Water Resources

1. Have students review the Hawaiian vegetation zones of your area, referring to the maps that they developed earlier. Ask them to identify prominent stream(s) or freshwater sources in your area. List their names and offer the best possible definitions for each.

2. Discuss whether the streams are perennial (flow all year round) or intermittent (seasonal). It is likely that most of the streams are intermittent. Discuss why that might be.

3. Play the *Maoli Nō* DVD, interlude #8 – *The Watershed: Nature's Collection Basin* and interlude #9 – *A Giant Sponge.*

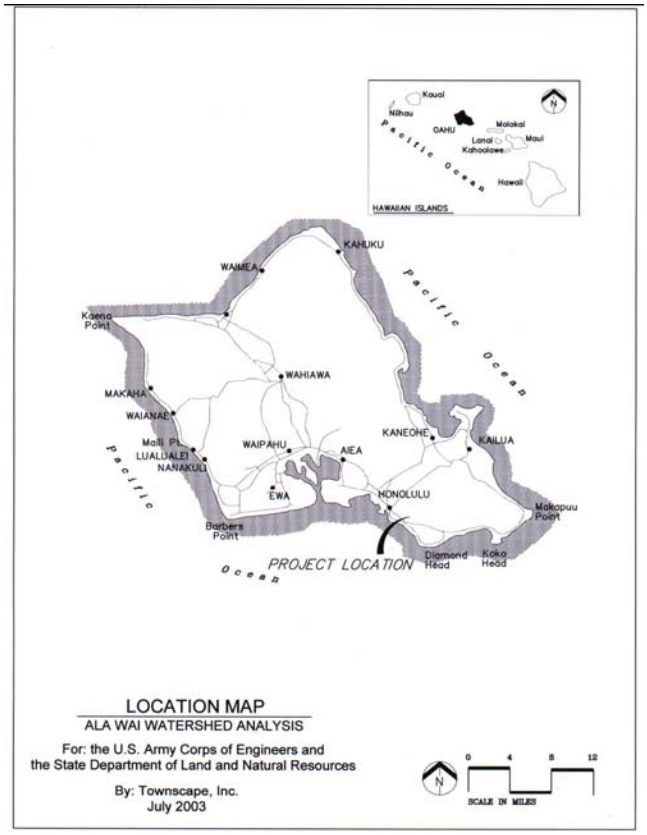
   "A watershed is an area of land, such as a mountain or a valley, that catches and collects rain water. Topography influences how water moves toward the ocean via rivers, streams, or movement underground. In Hawai'i, our forested mountains are our primary watersheds. These areas, which contain both native and non-native forests, recharge our underground aquifers and provide a dependable source of clean water for our streams."

   "Millions of years of evolution have made the Hawaiian forest highly efficient at capturing and retaining water. Generally speaking, the more complex the structure of a forest, the more enhanced its watershed functions. The Hawaiian rainforest, with its marvelous multi-layered structure– tall canopy, secondary trees, shrubs and fern layers, ground-hugging mosses and leaf litter– acts like a giant sponge, absorbing water and allowing it to drip slowly underground and into streams. Even without rain, the forest can pull moisture from passing clouds. In Hawai'i, this interception can push water capture above and beyond total annual rainfall by as much as 30 percent."

4. Play the song, "E Hīhīwai" on the *Maoli Nō* DVD and discuss what the song is about using the lyrics and song notes.

5. As a writing project, ask students to write an essay based on the following: Hawai'i is a small, finite environment and freshwater is a critical resource that should be carefully monitored by the government. Consider traditional, early Hawaiian attitudes, beliefs, or practices concerning the use of water. Compare those practices to modern water use. What is the current status of fresh water resources in your ahupua'a? What are the major concerns and management plans for this watershed area? How would you describe the respect that is shown by all Hawai'i users to freshwater?

Ala Wai Watershed Analysis
State of Hawaii Department of Health. (1998).



www.poh.usace.army.mil/.../Ala%20Wai%20Watershed%20Analysis%20Final%20Report%20Body1_Jul2003.pdf

The Ala Wai watershed is located in the south, central sector of the island of O'ahu and includes the Makiki, Mānoa, and Pälolo drainages, as well as Wakīkī (Figure 1). Since the development of the Ala Wai Canal in the 1920's to drain the wetlands of Wakīkī, the Canal's water quality has deteriorated to where it is aesthetically objectionable and may also pose some health risk to the public. This watershed analysis was conducted to address these conditions.

The channelization of streams has led to a disconnect between people and the natural environment that has in turn led to neglect. Ala Wai watershed residents and users need to reconnect with the natural environment in order to foster a sense of responsibility and guardianship over watershed resources. Awareness and accessibility to information and the natural environment itself are integral parts of increasing stewardship.[2]

Activity 5: Culminating activity

1. Review what the students have learned throughout this lesson.

2. Ask students to work in small groups to develop and present a visual-media project (using PowerPoint, webpage, exhibit board, etc.) that reflects what they have learned about their ahupua'a.

3. Invite other classes, faculty, and administration to listen to your student teams as they present their projects so that they have a better understanding of the place in which the school is located.

Extended Activities

- Have students take landscape photos of the area where they live or where the school is located (if different). Then have them find historical photos of these areas and compare and contrast the photos.

- Ask students to offer moʻolelo, proverbs, or sayings for the forest birds and other animals that were once common in your area.

- There are many freshwater and wetland native Hawaiian plants and animals that were used for food and medicine. Have students list their names, how they were used, and provide proverbs, stories, songs or sayings that offer a Hawaiian cultural perspective to their value and importance.

Resources

Internet:
Leave No Trace at http://www.lnt.org/programs/lnt7/index.html
UH Botany Department - www.botany.hawaii.edu/faculty/carr/natives.htm
Board of Water Supply, City and County of Honolulu - http://www.hbws.org/

Mary Pukui, *ʻŌlelo Noʻeau* (book)

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

ʻImi Pono no ka ʻĀina
Seeking Excellence for the Land