

## Unit: Become an Urban Forester

### Lesson 4: Tree Stewardship

**Lesson Goal:** The goal is to learn about tree stewardship and to plant a tree in your area.

- ❖ What does it mean to be a steward of trees?
- ❖ Learn the benefits of planting native
- ❖ Provide solutions to helping our urban forest

#### Q. What is Stewardship?

Stewardship is the responsible overseeing and protection of something worth caring and preserving. It is our **kuleana** (“responsibility”) to steward our resources, particularly to ensure our resources are used in a sustainable way. Another word that means ‘to take care of’ is **Mālama** and **Malama 'Aina** means to care for and nurture the land.

**Q. Why is it important that we steward our trees, both in forested lands and in the urban area. What would happen if we didn't have anymore trees?** There is no right or wrong answer. This is to get students thinking.

#### Global Issues of local relevance

**Q. Who has heard about deforestation? What is it?**

Deforestation is the process of clearance or clearing trees permanently to make something other than forest. Deforestation can involve conversion of forest land to farms, ranches, or urban use. The most concentrated deforestation occurs in tropical rainforests.

**Q. Is deforestation happening on O'ahu?**

Whilst many think that deforestation happens only in the Amazonian jungle or deep into the heart of Borneo, cities in the US are facing tree loss at a massive and unprecedented rate. Where have you seen the permanent removal of trees is due to housing (re)development or disease, for examples?

Did you know that the **native, endemic** tree 'Ōhi'a was once found in areas ranging from the coast to the summits of our mountains. However, with urban development, these trees are now found only in the mountains.

**Q. What can we do to make a difference?**

We can learn about, protect, and plant native trees. We can also join in planting efforts!

The City and County of O'ahu is committed to:

- ❖ Increasing the urban canopy goal of 35% by 2035.
- ❖ Planting 100,000 trees by 2025.

**Modules 4.1 - 4.3**

#### Deforestation

Human-driven and natural loss of trees—deforestation—affects wildlife, ecosystems, weather patterns, and even the climate.

In the Amazon, for example, around 17% of the forest has been lost in the last 50 years, mostly due to forest conversion for cattle ranching.

In the United States alone, approximately 175,000 acres per year or 36 million trees per year are removed from urban areas.

Did you know that 27,000 trees per day are wiped out for toilet paper?

#### Kinds of Trees

- A **native** tree is one that naturally occurred in its region, ecosystem, or habitat, without human introduction.
- An **endemic** tree is one that is only found in one specific area and nowhere else.
- An **endangered** tree is one that does not have many other of its kind in existence.
- A **keystone species** is a species on which other species in an ecosystem largely depend, if it were removed the ecosystem would change drastically.

*Whenever possible, plant one of these types of trees.*

#### Discussion Questions:

- How did this Unit change your perspective of trees?
- How will you be a better steward for our forests?

#### Ecological and Cultural Importance of Trees

In lesson 3 we talked about the importance of trees. We mentioned the capacity of trees to clean air and produce oxygen, provide shade, reduce air temperatures, contribute to a healthy watershed by reducing runoff and prevent erosion by hold the soil in place.

#### How are trees ecologically Important?

In addition to being important to humans (as discussed in previous lesson) trees provide food and **habitats** for birds, bats, insects, and other wildlife.

In fact plants are the base of the **food chain**. Through photosynthesis they harvest the energy of the sun, then plants are fed upon by insects, which may be eaten by birds, which are eaten by birds of prey, and so on.

An example of ecologically important plant is 'Ilima. 'Ilima attracts native pollinators such as the yellow-faced bees (*Hylaeus spp.*) and provides food for the Nihoa finch (*Telespiza ultima*), an endemic Hawaiian honeycreeper critically endangered. 'A'ali'i provides food for the blackburn butterfly (*Udara blackburni*), caterpillars, two endemic Hawaiian butterflies, and koa bug (*Coleotichus blackburniae*). The seeds were eaten by the extinct Hopue or Greater koa-finch (*Rhodacanthus palmeri*).

Although native forest are being cut, and are changing due to invasion of non native species, they still provide habitat for nativeinsects, birds, bats and other native animals and plants found nowhere else in the world.

#### Have you ever heard about the cultural importance of plants?

Plants are essential for human life and are important for all human cultures. Trees and plants provide food for our communities, medicine, materials for construction, tools for building, for fishing and for agriculture, clothes, ornamentation and resources for cultural practitioners; they even provide material for making supplies for sport and recreation, such as canoes and traditional surfboards.

In the past, plants were so important than when the ancient Polynesians came to Hawaii in their canoes, they brought with them a variety of plants called **canoe plants**. Since Canoe plants were brought to Hawaii, they are not native, however they are an important part of our cultural heritage. Some examples of canoe plants are: taro, kukui, breadfruit, coconut, banana, ti, noni, olena, kava, hala and sugarcane

If native Hawaiian forest becomes extinct, many aspect of Hawaiian culture will be irrevocably lost for young people.

#### Habitat

natural home or environment of an animal, plant, or other organism

#### Food chain

In ecology, a food chain is a series of organisms that eat one another so that energy and nutrients flow from one to the next.

Every living thing—from one-celled algae to giant blue whales—needs food to survive. Each food chain is a possible pathway that energy and nutrients can follow through the ecosystem. For example, grass produces its own food from sunlight. A rabbit eats the grass.

## Unit: Become an Urban Forester

### Lesson 4: Tree Stewardship

#### THE SIGNIFICANCE OF NATIVE TREES

Few of us know much about native plants in Hawai'i and how important they are to the health of our unique ecosystems. Many of our native trees are a keystone species in our forests and were very significant and sacred trees in Hawaiian culture, for such uses as hula, medicine, and mythology. It is crucial that we do our part to preserve our native trees. Below is a description of just native trees but there are many more species about which to learn.

***Thespesia populnea*, Milo**, also known as a portia tree, is a member of the Hibiscus family, the *malvaceae*. It is a widespread species throughout Polynesia and Micronesia, as well as in tropical Africa.



Although rare today, in old Hawai'i milo was a commonly found tree, cultivated as a shade plant around homes near sunny coastal areas with loose soil. It does not grow in the high inland forests.

Milo wood has an attractive grain that takes to a high polish. It was skillfully crafted in pio bowls and plants ('Umeke la'au), paddles and other carved objects, as well as for an occasional canoe.

The milo tree is a small to medium-sized one, growing to less than 40 feet high. The trunk can be 2 feet in diameter at full maturity. The bark is corrugated, with scaly twigs. The branches are widely spread and usually horizontal, making for an ideal shade tree. The glossy heart-shaped leaves are 3-5 inches across. Young leaves are edible. Bell-shaped pale yellow flowers with maroon or purple centers turn purplish-pink as they do in their short one day hibiscus life.

***Metrosideros polymorpha*, 'Ōhi'a**. The scientific name *metrosideros polymorpha* derives the Greek *metra*, heartwood, and *sideron*, iron, referring to the very hard wood of these plants. *Polymorpha* is from the Greek *poly*, many, and *morphos*, forms, in reference to the numerous forms or shapes of this species. Probably no other native Hawaiian plant is found in a greater number of varieties than this one. The sheer number and variations of 'Ōhi'a shrub to tree forms, leaf colors and shapes, and floral colors are a sight to see. The diversity of the 'Ōhi'a tree could stem from the fact that it is capable of growing in most soil types across the Hawaiian Islands from mauka to makai.



When the Hawaiian Islands were still taking form, lava erupted and it produced barren and new lands. The first pioneer or signs of life emerging from the lava fields were 'Ōhi'a shrubs and trees. From those first 'Ōhi'a sprung life in the form of many other plants, birds, insects, even snails. Because of the 'Ōhi'a's special capability to colonize first, 'Ōhi'a trees are known as a **keystone species** and debatably the most important native Hawaiian plant.

Since this species was dominant across the landscape, it shaped many aspects of Hawaiian culture. 'Ōhi'a's sturdy wood was used to create weapons, cloth beaters, boards for pounding poi, enclosures and statues; its leaves were used as a medicinal tea; its flowers were used as adornments for hula or ceremonies; and its flowers and seeds fed native birds. In songs and story, the 'Ōhi'a and its flowers, lehua, are associated with the physical manifestations of Hawaiian gods such as Pele, Hi'iaka, Kāne, Kū, Kapo, and Laka.

'Ōhi'a is under many threats, including disease as mentioned Lesson 2.



### Module 4.1: Native Tree Planting

**Objective:** Learn how to plant a tree a service action help our community. Remember that native plants are always the better option.

#### Materials:

- Compost (optional)
- Mulch (optional)
- Potted tree or shrub
- Shovel
- Trowel
- Water
- Watering can or container

If you do not have a tree to plant, many of our Hawaiian trees can be **grown from a branch** (called cuttings) and Hawaiian plants by **dividing a plant root**. Search the internet for details on these simple and inexpensive techniques to grow a tree.

#### Procedure:

1. Choose a spot on the property
  - a. It should match your tree species' ideal growing conditions (full sun, partial sun, shade, dry, wet, etc.).
  - b. It should allow your tree to grow to mature size without interfering with anything (such as power lines, other trees and infrastructure).
  - c. It should be accessible for watering or irrigation.
2. Dig the hole
  - a. The width should be 3 times the width of the root ball to allow the roots to spread out.
  - b. The depth should be the height of the root ball.
3. Free your tree
  - a. Carefully remove the tree from the container by massaging the outer edges of the container - do NOT pull on the trunk.
  - b. If removing from a small container, place your hand on the root ball surface and flip the container upside down over the hole to remove the container.
4. Plant your tree
  - a. Place your tree straight so the trunk flare (the area where roots start to flare out at the base of the tree) will be slightly visible above the ground.
5. Add soil
  - a. Fill the hole with soil - a few inches at a time. Compress soil lightly and settle with water to make sure there are no air pockets.
6. Mulch (if you have)
  - a. Add a 2-4 inch thick ring of mulch around the base to help the soil retain moisture.
  - b. Do not pile mulch on the trunk - this can decay the bark.
7. Water your tree
  - a. Remember to water, but don't over-soak the soil.
  - b. Enough to keep the soil moist, which is usually at least once a week.

### Module 4.2: Toilet Paper Roll Seed Starting

This is good if you have access to a seed and do not have access to a tree or shrub. Focus on planting native, bee friendly plant, and/or food producing seeds.

**Objective:** Use an environmentally-friendly method that recycles an everyday household item to grow a seed.

#### Materials:

- Seed
- Cardboard toilet paper, paper towel, or wrapping paper rolls
- Scissors
- Tray/platet to put seed pots on
- Soil
- Water



#### Procedure:

1. Make a series of 1 to 1 1/2-inch cuts around one end of the roll, approximately a half an inch apart.
2. Fold the cut sections in toward the center of the roll. This will create the bottom of your pot.
3. Fill the pots with soil, moisten the soil, and pot and plant your seeds.
4. Maintain the planted seeds as you would any seeds sown indoors. Typically, you will have to wait a few weeks before you can remove the plants and embed them into the garden.
5. Plant the toilet paper seed pods in the garden, cardboard tube and all. Cardboard will biodegrade and feed your new plant.



### Module 4.3: Adopt a Tree

**Objective:** Officially adopt and register the newly planted your tree. By signing the Certificate of Adoption, you are making a commitment to be responsible stewards toward their tree.

**Materials:**

- Certificate of Adoption
- Marker or pen
- Planted shrub/tree
- Cell phone or computer
- Certificate of adoption



**Procedure:**

1. Read the certificate
2. Sign the certificate
3. Register your tree online
  - a. On the Certificate of Adoption, use your camera on your cell phone to select the QR code. You will be directed to <https://BIT.do/treesoahu> where you will register your tree.
  - b. By computer, type <https://BIT.do/treesoahu> into the url.
  - c. Follow the prompts. Please remember to mention Pop-Up Labs for Sustainability in the comment section.
4. Continue to care for your tree

### Discussion Questions

- Why is it important to monitor trees?
- Explain why you think foresters would want to track this information?
- What does it mean to make a commitment?

Look up facts about your tree and what parameters it needs to survive (e.g., partial sun or sun, lots of water or little water).

You are assisting the City & County of Honolulu with reaching its goal of 100,000 trees by 2025 and increasing the canopy cover by 35% by 2035!

You can also volunteer with a group that is planting trees in your neighborhood!

# Certificate of Adoption

Congratulations! You are the new proud owner of a

---

Your seedling will add to the future tree canopy of Hawai'i! Your support and care of this new tree is an important part of ensuring a green and livable Hawai'i. Mahalo nui.

*"The best time to plant a tree was 20 years ago... The second best time is now."*

By accepting this seedling, we ask that you act in accordance with the following two requests:

**Download Your Care Card**



All Trees are not created equal! To ensure the best chance at survival for your tree.  
[Download](https://www.ArborDayHawaii.org/TreeCare) your tree species' specific planting & care instructions here:  
[www.ArborDayHawaii.org/TreeCare](https://www.ArborDayHawaii.org/TreeCare)

**Register Your Tree**



Honolulu's Mayor set a goal to increase Honolulu's canopy by planting 100,000 trees by 2025! Help O'ahu reach this goal.  
**Register** your tree here:  
[BIT.do/treesoahu](https://BIT.do/treesoahu)

Funding institution is an equal opportunity provider and employer.

---

(Please sign in agreement)



# Certificate of Adoption

Congratulations! You are the new proud owner of a

Your seedling will add to the future tree canopy of Hawai'i! Your support and care of this new tree is an important part of ensuring a green and livable Hawai'i. Mahalo nui.

*"The best time to plant a tree was 20 years ago... The second best time is now."*

By accepting this seedling, we ask that you act in accordance with the following two requests:

## Download Your Care Card



All Trees are not created equal! To ensure the best chance at survival for your tree..  
[Download](#) your tree species' *specific* planting & care instructions here:  
[www.ArborDayHawaii.org/TreeCare](http://www.ArborDayHawaii.org/TreeCare)

## Register Your Tree



Honolulu's Mayor set a goal to increase Honolulu's canopy by planting 100,000 trees by 2025!  
Help O'ahu reach this goal..  
[Register](#) your tree here:  
[BIT.do/treesoahu](http://BIT.do/treesoahu)



Funding institution is an equal opportunity provider and employer.

(Please sign in agreement)

# Tree Planting & Care Tips

Give your tree the best start!



## 1. Choose a Spot on your Property

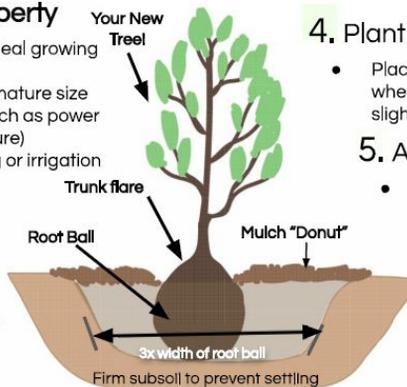
- It should match your tree species' ideal growing conditions
- It should allow your tree to grow to mature size without interfering with anything (such as power lines, other trees & other infrastructure)
- It should be reachable! For watering or irrigation

## 2. Dig the Hole!

- **Width:** should be 3 times the width of the root ball to allow the roots to spread out
- **Depth:** only dig the hole as deep as the height of the root ball

## 3. Free Your Tree

- Carefully remove your tree from the container - do NOT pull on the trunk
- Carefully handle the root ball and straighten any circling roots



## 4. Plant Your Tree

- Place your tree straight so the trunk flare (the area where roots start to flare out at base of tree) will be slightly visible above the ground

## 5. Add Some Soil

- Fill in the hole with soil a few inches at a time - settle with water to make sure there are no air pockets

## 6. Mulch!

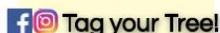
- Add a 2-4" thick ring of mulch (aka the Mulch Donut) around the base to help the soil retain moisture
- Do not pile mulch ON the trunk - this can decay the bark

## 7. Water Your Tree

- Remember to water- but don't over-soak the soil!
- Enough to keep the soil moist, which is usually at least once a week

### \* Tree Hugger Tip\*

Share your Aloha! Studies have shown that plants grow faster when you talk them! How far will you go to become a full fledged tree-nerd?



Tag your Tree!

Share your tree with us, we would love to see where our keiki trees end up.

#Kaulunani @Kaulunani #PulsHawaii @pulshawaii