CITIZEN FORESTER PROGRAM

Volunteer Handbook

GUAM

The following guidelines may be updated periodically to reflect any updates to best-practice industry standards.

Smart Trees Pacific is a 501(c)3 nonprofit urban forestry organization working to support Guam's Urban and Community Forestry Program of the Department of Agriculture of Guam Forestry & Soil Resources Division and Kaulunani Urban and Community Forestry Program of the DLNR Division of Forestry and Wildlife. The organization is based on the island of Oʻahu serving the Hawaiian Islands and greater Pacific Region.

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Introduction

Citizen Forester Program

The Citizen Forester Program trains, certifies, and supports community members as citizen scientists to collect urban tree inventory data, plant and care for community trees.

Natural resources managers can better care for their trees with data collected to industry standards, and community members become informed ambassadors for the trees in their neighborhoods.

INVENTORY

Collecting location and condition data on public trees to better the management of Hawaii's public trees.

OUTPLANTING & CARE

Planting and establishing new public trees to ensure survival of our growing urban tree canopy.

ADVOCATE

Employs citizen science as a viable approach to gain knowledge and community support for urban forests.

Creating an Urban Tree Inventory

An urban tree inventory was identified as one of the top strategies in the Urban Forestry Section of Hawaii's Forest Action Plan. Like many regions, there is no formal inventory of city trees being used in Hawaii. This hinder efforts to manage, maintain, replace trees, and plan for disasters in the urban forest. Management of any resource begins with an inventory of that resource. Urban Forest Management is no exception. Trees are infrastructure! With this resource, work can be done to add more trees to our urban forests. An accurate inventory directly aids in city planning, environmental impact, and public health assessments while increasing community awareness of the benefits of trees. The program can also assess areas where trees are needed the most, by mapping potential planting sites, so work can be done to increase our green infrastructure.

Growing the Urban Tree Canopy

Sharing the benefits of trees with our community involves maintaining our current urban forest, and growing it. The Citizen Forester Program teaches community members how to properly select, care for and maintain trees as community foresters alongside public partners.

Increasing Awareness for our Urban Forests

Another key strategy that have been identified is improving the public perception of the value and benefits of urban trees. The Citizen Forester program looks to address these strategies by engaging communities in their urban forests through the use of citizen science to develop an urban tree inventory. The program employs citizen science as a viable approach to gain knowledge and community support for urban forests.

Program Partners

The Citizen Forester program is a collaborative project of partners:

The United States Department of Agriculture Forest Service
USDA Forest Service is a federal agency; Urban and Community Forestry is part of the Forest Service's State and Private Forestry (S&PF) division. S&PF reaches across the boundaries of National Forests to States, Tribes, communities and non-industrial private landowners.

Department of Agriculture of Guam
The Guam Department of Agriculture was established under Public Law 3-103, effective August 1, 1956. The Department was established to protect and promote the agricultural resources and economy of the Territory of Guam by research, quarantine, control and conservation.

Department of Agriculture of Guam, Forestry & Soil Resources Division
The mission of the Forestry & Soil Resources Division (Guam Forestry) is to conserve, protect and enhance Guam's vegatative environment and sustain the natural resources which are dependant on healthy forests.

Smart Trees Pacific
Smart Trees Pacific is a non-profit urban forestry organization serving Hawaii & the Pacific Region! Hawaii's tropical urban trees are a vital resource and STP works to raise awareness & support for our urban forests! Smart Trees Pacific manages the State's Kaulunani Urban & Community Forestry Program in partnership with DLNR, DOFAW.

Introduction

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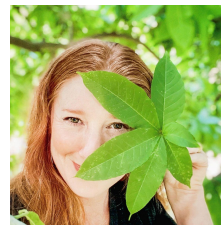
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Urban Forestry

WHAT IS URBAN FORESTRY?

Urban forestry is generally defined as "the art, science and technology of managing trees and forest resources in and around urban community ecosystems for the physiological, sociological, economic, and aesthetic benefits trees provide society".

Urban forestry is practiced by municipal and commercial arborists, municipal and utility foresters, environmental policymakers, conservationists, city planners, consultants, educators, researchers, community activists, and Citizen Foresters!

WHAT IS AN URBAN FOREST?

Simply, urban forests are made up of the trees in our cities and urban areas. The portion of the **urban ecosystem** that consists of forest vegetation, water, soil, and wildlife in densely populated areas and adjacent lands.

WHY ARE URBAN FORESTS IMPORTANT?

Our urban forests are some of the strongest defenses we have against many psychological, sociological, economic and climatic issues we face today. The following several pages with go into more detail on the benefits that tree provide for us and our cities!

OPTIONAL READING:
- **The Guardian.** The importance of urban forests: why money really does grow on trees.
- **Arbor Day Foundation.** The Importance of Urban and Community Forestry

Benefits of Trees

What are some of your favorite **ECOLOGICAL**, **ECONOMICAL**, and **CULTURAL** benefits of trees?

How trees make our lives better

GROWING TREES MAKE GREAT NEIGHBORHOODS

Trees make the places we live feel like home

Trees provide privacy and more comfortable settings.

TREES SLOW TRAFFIC.

TREES REDUCE NOISE.

Trees help reduce crime.[1]

Trees are beautiful.

Trees clean the air and the water

Trees absorb odors and filter pollution out of the air by trapping them in their leaves and bark.

Tree foliage absorbs & filters rainwater helping slow down stormwater runoff during rainstorms.

Trees help reduce carbon that builds up in the air. This carbon build up increases temperatures and leads to changes in our climate.

TREES RENEW OUR AIR SUPPLY.

Trees absorb carbon dioxide and produce oxygen.

Trees help your family be healthy

Research shows views of trees improves recovery from stress within 5 minutes as indicated by changes in blood pressure and muscle tension.[2]

Creating natural places with views of trees supports outdoor activities reducing stress and violence, and positively affecting behavior which helps combat obesity.[3]

Kids living in areas with more street trees have less asthma.[4]

MORE REASONS TO Love Trees

One of the earth's greatest natural resources

An **acre** of average trees gives almost **20 people** clean air & shade annually

One large tree can provide enough oxygen for up to **4 people's** daily needs

A building can **reduce** it's air conditioning needs by **30%** if trees are properly placed

The net cooling effect of a young, healthy tree is equivalent to **10** room-size air conditioners operating **20 hours** a day

A mature tree removes almost **70 times** more pollution than a **newly planted** tree

Annually, **10 million** tons of newspaper are tossed in land fills...

If just **half** was recycled, it would save **75 million** trees. That's equivalent to 637 500 000 000 sheets of paper

Every ton of paper recycled saves **7,000** gallons of chemicals

Recycling paper needs **64% less** energy than creating new paper

Replacing your toilet paper to **recycled** ones can have a **huge impact.** We use more than **200,000 trees** every year just to wipe our bums

REFERENCES
http://www.savatree.com
http://www.sfenvironmentkids.org/water/The Pacific Garbage Patch Fact Sheet.pdf
http://environmentvictoria.org.au/content/why-waste-matters
http://answers.yahoo.com/question/index?qid=20081110082126AAaTArK
http://science.howstuffworks.com/environmental/green-science/question16.htm
http://www.zimbio.com/Earth+Day/articles/ZjP5HlhGoh/Earth+Day+15+Celebrities+care
http://www.defra.gov.uk/environment/climate/government/

coolaustralia.org
Educating for a sustainable future

Benefits of Trees

HUMAN HEALTH: Trees have been proven to have a deep impact on our moods and emotions. A healthy urban forest is an essential element of human health. Trees improve physical and mental health by increasing energy levels and speed of recovery, while decreasing blood pressure, stress and even asthma. Students have even been recorded to have higher test scores and better focus when trees are in view.

US Forest Service - Urban Nature for Human Health and Well-Being (Website)
US Forest Service. 2018. Urban Nature for Human Health and Well-Being Full Report (PDF 11mb)

ENVIRONMENTAL HEALTH: Trees also improve the health of the environment by improving air quality, conserving water, reducing soil erosion, filtering runoff, reducing flooding and trapping pollutants such as dust, ash, pollen and smoke that can also damage human lungs. Trees are actually carbon sinks, meaning they absorb CO_2 and other harmful gases and, in turn, replenish the atmosphere with oxygen; Honolulu Trees absorb around 7.9 tons annually! An acre of trees will produce enough oxygen for 18 people every day while absorbing enough CO_2, each year to equal the amount you produce when you drive your car 26,000 miles.

US Forest Service. 2015. The Urban Forest and Ecosystem Services: Impacts on Urban Water, Heat, and Pollution Cycles at the Tree, Street, and City Scale (Downloadable PDF)

SAVE ENERGY: Trees also reduce the greenhouse effect by shading our homes, office buildings and city structures. This reduces air conditioning needs up to 30 percent, thereby reducing the amount of fossil fuels burned to produce electricity. It has been estimated that the total annual energy savings in Honolulu is around $621,760 dollars. If you are able to get professional assistance to assure correct selection of species and their placement, you can maximize energy savings even more.

US Forest Service (2017). Residential building energy conservation and avoided power plant emissions by urban and community trees in the United States
Home Energy Extension (2019). Tree planting for lower power bills.

CREATE WILDLIFE BIODIVERSITY: Trees provide habitat, food and protection to plants and animals, increasing urban biodiversity. Specifically, Hawaii is facing an extinction crisis unlike anywhere else on the planet and urban forests are some of the only refuge our native species have as our cities continue to expand and as their natural habitats decrease. Hawaii's native Manu o Kū, or the White Fairy Tern is one important native species that rely on Urban Forests!

Yale Environment 360. Urban nature: how to foster biodiversity in the worlds cities.
Hiraishi, K. (2017) Hawaii Public Radio. Native birds recolonize urban honolulu.

Benefits of Trees

ECONOMIC BENEFITS: Trees enhance community economic stability by attracting tourists and new businesses. Studies have shown that trees can increase property value by 10-20 percent! Areas with trees experience lower crime rates and in well-landscaped business districts consumers shop more often and longer. Consumers are willing to pay more for parking and pay 12 percent more for goods and services in well landscaped areas. The total annual benefit of trees on property values in Honolulu has been estimated to be around $3.16 Million dollars.

D. Nowak (2017). US Forest Service. Assessing the benefits and economic values of trees.

PROMOTE HEALTHY ACTIVITIES AND EXERCISE:
Trees create attractive landscaped amenities that preserve open land used for recreational activities. Green spaces encourage walking and biking, in fact studies have shown that people judge distances to be less in green spaces and are more likely to travel on foot, which has added health benefits.

University of Washington (2010). Active Living
Arbor Day Foundation (2018). 6 ways trees make you more active outdoors.

REDUCE NOISE POLLUTION: Trees absorb and block noise from the urban environment; a dense tall tree can reduce noise up to 50%! Trees also reduce wind speed, which helps when we are experiencing our 80 mph trade winds.

Trees for Energy Conservation Extension (2019).How does vegetation help reduce noise pollution in urban ecosystems?
Arboricultural Advisory and Information Service (2000).Trees and shrubs for noise.

REDUCE HEAT ISLAND EFFECT Cities suffer from the urban heat island (UHI) effect which describes how urban areas are warmer than its surrounding rural areas. These heat islands result from storage of thermal energy in concrete, steel and asphalt and human activities. Heat islands are 3 to 10 degrees warmer than the surrounding rural areas and trees are one of the main defenses and reduce this effect significantly. So trees can cool our most urban areas!

US EPA Using trees and vegetation to reduce heat islands. (Website)
All Things Considered, NPR (2019). Trees are key to fighting urban heat, but cities keep losing them

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Urban Tree Canopy

WHAT IS URBAN TREE CANOPY?

An **Urban Tree Canopy** (UTC) refers to the layer of tree leaves, branches, and stems that provide tree coverage of the ground when viewed from above.

WHY IS UTC IMPORTANT?

Trees provide many benefits to communities, such as improving water quality, reducing storm water runoff, lowering summer temperatures, reducing energy use in buildings, reducing air pollution, enhancing property values, improving human health, and providing wildlife habitat and aesthetic benefits. Many of the benefits that trees provide are correlated with the size and structure of the tree canopy, which is the layer of branches, stems, and leaves of trees that cover the ground when viewed from above. Therefore, understanding tree canopy is an important step in urban forest planning. A tree canopy assessment provides an estimate of the amount of tree canopy currently present as well as the amount of tree canopy that could theoretically be established. The tree canopy products can be used by a broad range of stakeholders to help communities plan a greener future.

WHAT IS HAPPENING TO OUR CANOPY?

Take time to read through the full report

Honolulu is losing tree canopy.

In fact, we lost nearly 5% of our total urban tree canopy over four years.
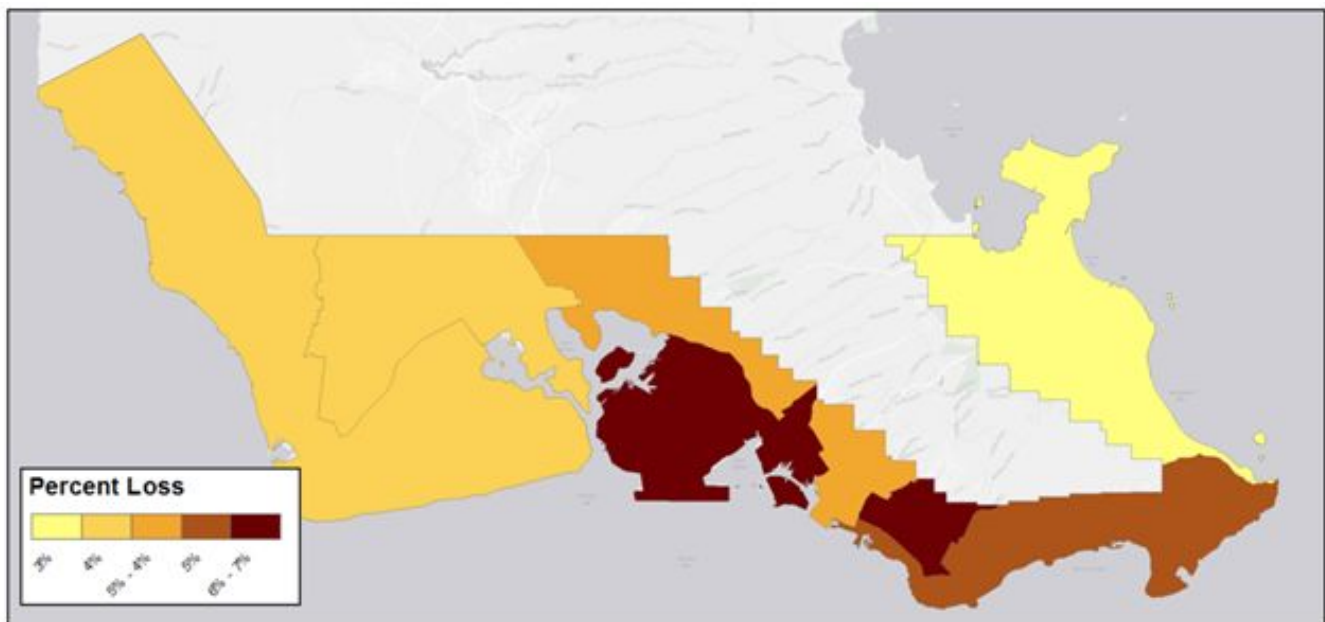
Figure 5: Percent loss in tree canopy for Council Districts, calculated as losses relative to 2010 conditions.. This chart compares the relative magnitude of losses between study units irrespective of gains.

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Urban Tree Inventory

WHAT IS AN URBAN TREE INVENTORY?

An urban forest inventory collects relevant information on urban forests within municipalities or urban areas. Inventories can show where new trees can be planted, where undesirable or invasive trees are located, and also where hazardous trees are located. This is particularly important when planning for storm management.

Management of any resource begins with an inventory of that resource. Urban forest management is no exception.

Trees are infrastructure!

Example from West University City, Texas
Vibrant Cities Lab. Street Tree Inventory. (Website and online resource).
North Carolina Forest Service. Urban and Community Tree Inventories (Website).

The Citizen Forester Program is in the process of creating the state's very first systemic urban tree inventory for city-managed trees! This effort began in 2016, and as of 2020 there have been over 10,000 trees mapped on Oahu. The inventory is publicly accessible and can be viewed at PG-Cloud.com/Hawaii. Take a moment to scan the tree already on the map! Our inventory shows:

- **Where our trees are located**
- **Which trees need attention**
- **Where trees are needed**
- **What benefits our trees provide**

Visit Guam's Online Public Tree Inventory

What Can Be Done?

1. PLANT TREES

Plant & Plan for more urban trees! The Good News... We have room for an additional 7,924 acres of the urban land area that could be modified to hold. There is Potential for More Trees!

2. POLICY

Advocate for stronger policy supporting the growth and maintenance of our cities' trees. Let your representatives know that our urban forest is important! Find your representative.

3. JOIN THE CITIZEN FORESTER PROGRAM!

An accurate inventory directly aids in city planning, environmental impact, and public health assessments while increasing community awareness of the benefits of trees.

You are already doing something, thank you!

Opportunities for Improvement

Existing Tree Canopy	Available Green Space for Planting		Available Hard Surfaces		Not Suitable
	Government Lands	67%	Residential Land	52%	
	Rural Land	27%	Commercial/Industrial	21%	
	Residential Land	16%	Government Lands	18%	
	Commercial/Industrial	5%			

Easiest — Hardest

Less — **Impact** — Highest
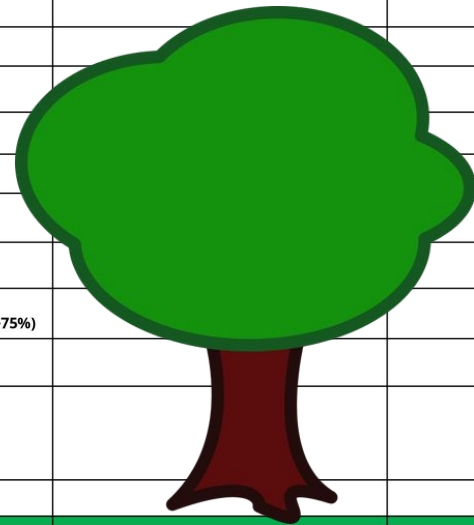
Tree Assessments

Overview

Tree Information:

- Stems

- Diameter at Standard Height or DSH (4.5 feet) – (How wide is the trunk)
  - Using measuring tape or pre-measured string, Determine standard height on each person, & Learn the Exceptions

- Crown Density
  - Crown of Tree versus crown of stems

- Percent Dieback
  - The amount of dead tips of the branches

- Crown Spread
  - 2 measurements; long & short drip line to drip line, using your own pace. Learn the exceptions - drip line is behind a fence, etc

- Tree Height
  - Range finder method, Stacking method

- Live Crown Ratio
  - The live leaf crown as a percent of the tree, observing from the side

- Tree Condition
  - What makes a Tree "good" condition?

Location Information

- Wires - conflict or no conflict

- Land use (Single Family, vacant lots, park, planting strip, unimproved sidewalk)

- Location (front, rear, left, right, park) - relative to buildings or park

- Tree Comments & Photos (of unusual observations or questions for arborist review - burned out holes, many water sprouts, hollow out trunk, bike chains, insect bore holes).

STREET ➡			
TREE ID INFORMATION			
Status (Alive, Dead, Stump)			
Common Name			
Number of Stems			
DSH			
Density: (0-25, 25-50, 50-75, >75%)			
Dieback Percent: (0, <5, 10, 20, 40, >60%)			
Crown Spread (ft.)			
Crown Spread (ft.)			
Height Range			
Live Crown Ratio (0, 25%, 33%, 50%, 67%, 75%, >75%)			
Condition: (Good, Fair, Poor, Dead)			
Tree Comments			
Photos (Y/N)			
Land Use: (SF, MF, Comm., Industrial, Lg. Comm., Park, Vacant, Other)			
Location: (Front, Rear, Left, Right, Rear, Park)			
Growth Space: (unimproved sidewalk/ planting strip, etc)			
Wires (No/Present & No Conflict/Present & Conflict)			14

Tree Assessments

❏ **CLIPBOARD & DATA SHEETS:** Our teams record all of our measurements on paper data sheets. Your team leader will provide these sheets during each mapping meetup.

❏ **DIAMETER TAPE:** is a calibrated measuring tape that uses circumference to find the estimated diameter of a circular object, in our case, a tree. We want to find the diameter of the tree, which would be if you drew a line straight through the center of the tree trunk. You may also remember from geometry class that the equation for diameter is Circumference divided by pi (π).

   Fortunately for us, the tape is conveniently calibrated in divisions of π. The measure assumes the trunk has a circular cross-section and gives a directly converted reading of the diameter.

❏ **100 FOOT MEASURE TAPE:** is a large measuring tape with fractional inch and decimal foot scales. For this program, the 100ft tape is used to measure crown spread, as well as height when using the stick method. (You will learn these assessments in the next section!)

❏ **YARD STICK:** Some teams may also carry a yardstick in order to collect height using the "Stick method" which you will be learning in Tree Assessments

❏ **RANGEFINDER:** Nikon Laser Forestry Pro Rangefinder/Hypsometer 8381. This waterproof and fog-proof rangefinder is made to not only measure distance but also height, vertical separation, horizontal distance and angle. **How-to-Use Video**

❏ **OUTREACH MATERIALS:** Team leaders will be equipped with pamphlets/flyers to hand out when meeting community members!

❏ **TREE ID CARDS:** Each team is equipped with a mini booklet with common street tree identification cards! They are also accessible online: bit.ly/hawaiitrees

Citizen Foresters work outdoors, where there is oftentimes no shade. On top of the above equipment, **each volunteer should prepare by bringing the following**:

   ❏ Mask (if desired, but not required)
   ❏ Sanitation Materials (Gloves, Sanitation Wipes, Hand Sanitizer, etc)
   ❏ Mobile Device with Data Capabilities (Cell Phone, Tablet, Etc)
   ❏ High Visibility Shirt
   ❏ Sun Protection (Sunglasses. Hat. Sunscreen, Etc)

Tree Assessments

Goal: Accurately measure the DSH of a tree

Purpose: Estimate the *volume* of a tree for approximate carbon storage capacity.

Definition: DSH stands for Diameter at Standard Height. DSH is a standard method of expressing the diameter of the trunk or stem of a standing tree. DSH is also referred to as DBH, or Diameter at Breast Height, and the two are used interchangeably. For this program, we use DSH.

Methods: For this program, we use a diameter tape. When used correctly, the diameter will be a direct read from the tape. The conversion is done for you!

Rounding: For this program: we round to the nearest whole number when recording DSH.
For measurements **0.1 - 0.4 = round down**, **0.5 - 0.9 = round up**

Exceptions: Healed wounds, nodules, water sprouts. Move measure up or down to avoid unusual growth to area of trunk that best represents diameter. Note diameter measured AGL in "Tree Comments"

4.5 ft

Tree Assessments
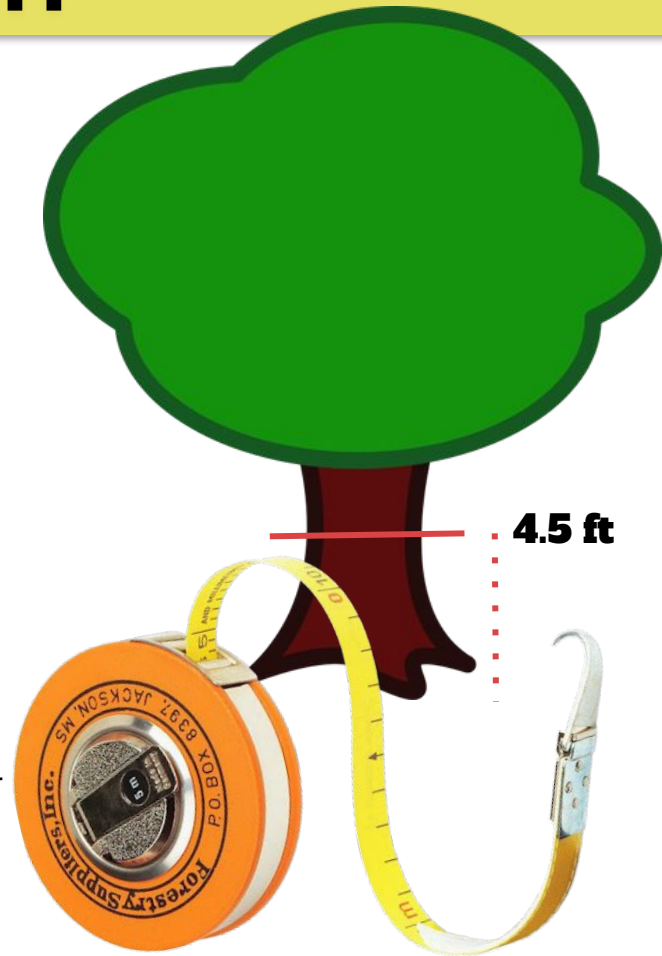
DSH

Unusual Measurements:

- **Leaning Stems:** measure at 4.5 feet high along trunk,

- **Large Stems**: use multiple tapes, or mark the trunk and reuse the tape.

- **Multiple Stems:** If the tree stems originate below 4.5 feet, measure each separate trunk At Ground Level (AGL). If stems are branch forms (not trunks) and originate below 4.5 feet, measure single trunk that best represents diameter.
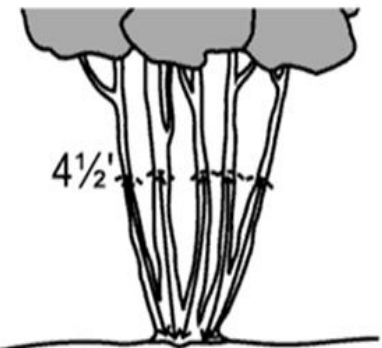
  Make a Note in Tree Comments: "DSH @ AGL or ___ft"

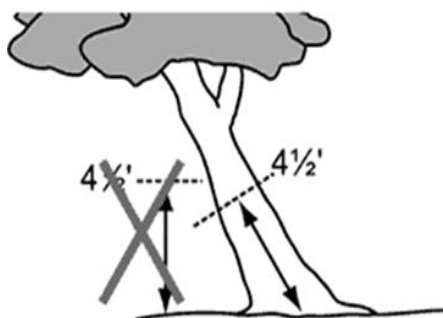- **Tree on a slope**: Measure 4.5 ft on the up slope.

4.5 ft

- **Deformity or Obstruction at 4.5 ft**: Move up or down to avoid unusual growth to area of trunk that best represents diameter. Measure the height of where you took the diameter measurement. Make a Note in Tree Comments: "DSH @ ___ft" (examples of obstruction: healed wounds, nodules, water sprouts, irregular growth, fence or other urban obstruction).
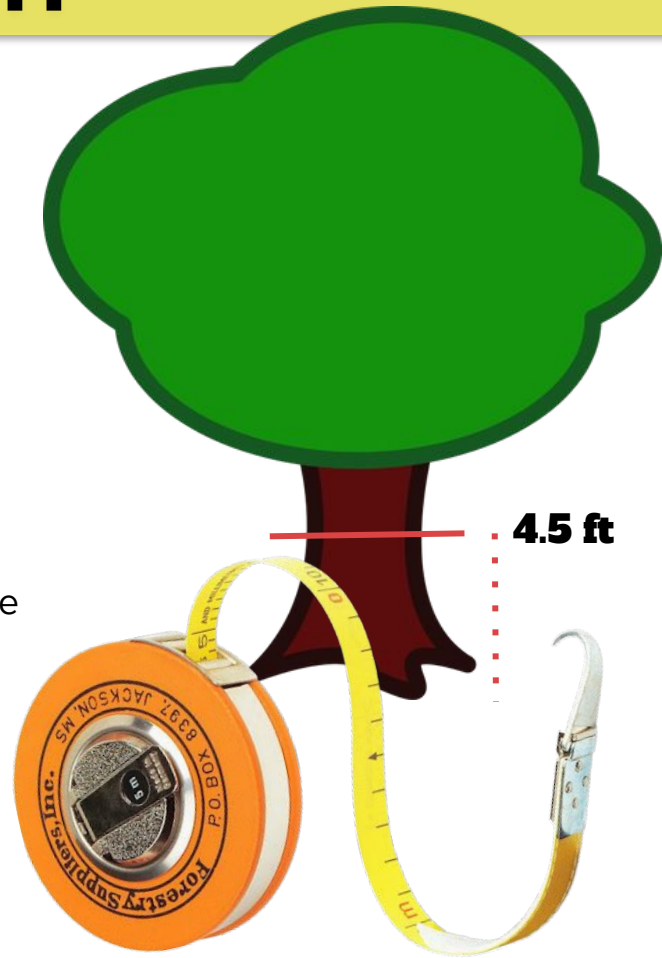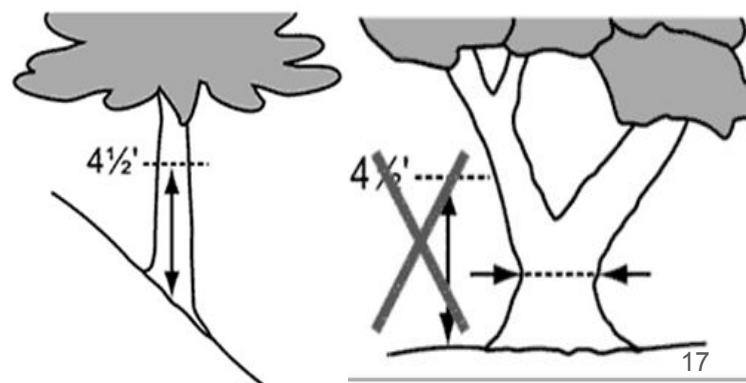
Measuring Multi-stemmed Tree   **Measuring Existing Trees with an Angle or on Slope**   **Measuring Split Trunk Tree**

4½'   4½'   4½'   4½'   4½'

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Tree Assessments

Density

Goal: Accurately determine the thickness of the tree crown uses percentages.

Purpose: By estimating the crown density, we are able to further define the "food" gathering potential of a tree's leaves. Photosynthesis happens in the leaves - where sunlight, water, and carbon dioxide (from the air) are converted into food and oxygen.

Definition: For this program, Crown Density is the amount of light and air penetration through crown. Crown Density includes the % of branches, foliage, and/or fruit that blocks light coming through the live crown.

For example: A crown is 100% dense if no light passes through the foliated branches. A tree crown is 0% dense if light is clearly visible with no live foliage blocking it.

Methods: Stand under tree and look up into crown. For trees of variable crown density, move around to 2 or 3 locations and estimate % of sky visible .

For this program, we record live crown ratio using the nearest percentage estimate in four categories: **0-25%, 25-50%, 50-75%, >75**

Exceptions: For this program, we record all palms as 0-25% unless clearly outside the norm.

Notes: Leaf size has no relation to this measure

| 0-25% | 25-50% | 50-75% | >75% |
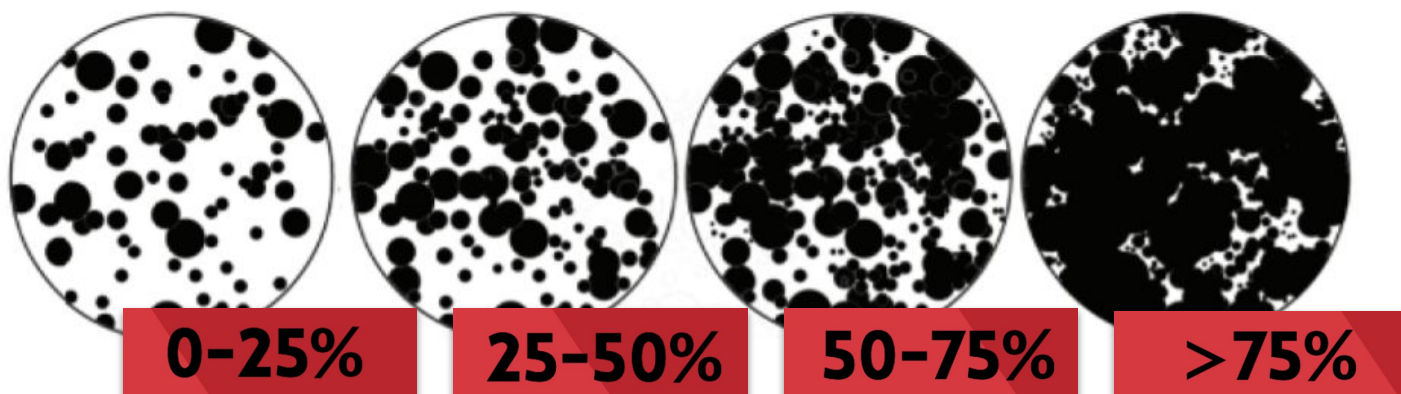
Dieback

Goal: Accurately assess the crown dieback and describe it using percentages.

Purpose: This observation helps us determine the tree's reaction to its environment. Crown dieback is an important indicator of tree health.

Definition: For this program, Tree Dieback refers to the death of ends of branches in upper and outer portion of crown. Dieback indicates loss of moisture at ends of branches most often caused by drought, root loss through disease or damage, water uptake restrictions through soil compaction, or vascular disease. Dieback is not caused by natural leave shedding.

Deciduous trees shed their leaves naturally at the end of their growing season. This occurs in the dry season in tropical and subtropical regions. In Hawaii, not all introduced trees that are deciduous in their native ranges shed their leaves in Hawaii due to the consistently warm climate. Their growing season is year-round!

For this program, we record percent dieback using the nearest percentage estimate using the following numbers: **0, <5%, 10%, 20%, 40%, 60%**

Ask yourself:

- Does this tree have dead branches?
- Do the dead branches show fine twig structure?
- Is this tree deciduous?

<5%   20%   60%

Tree Assessments

Crown Spread

Goal: To accurately measure the size of a tree's crown. The crown spread is often the first sign of a tree's size.

Definition: For this program, crown spread is the measurement taken at two (2) horizontal widths of the crown, taken from dripline to dripline.

Dripline: the outer boundary to the area located directly under the outer circumference of the tree crown. Imagine the tree as an umbrella, when the tree-umbrella gets wet, excess water from the top would roll down to the ground along the dripline of the umbrella - that is the dripline of the tree.

Methods: Cross method.

- 100 ft Measuring tape
- Pace
- Rangefinder

(if the spread is estimated to be greater than 50ft)
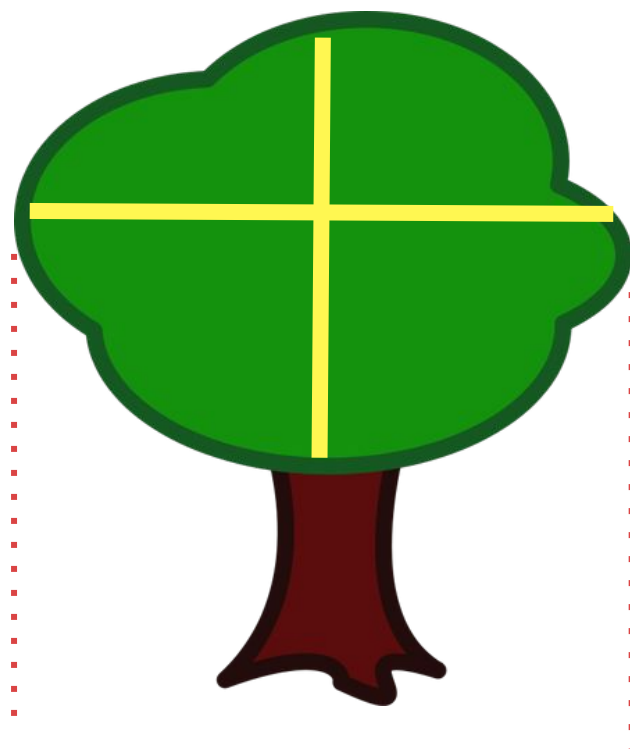
We record two (2) lengths, that make a cross:

- The longest spread from drip line to drip line (or edge to edge) across the crown
- The longest spread perpendicular to the first cross-section through the central mass of the crown. The measurements should be approximately right angles from each other. This is written in as the shorter measurement.

Note: Crown spread is taken independently of trunk position.

Tree Assessments

Crown Spread

Pace

Definition: For this program, we label "pace" as one walking stride; equal to two natural steps (left step, and right step).

Using 100ft Tape:
A pace is equal to two steps. To determine your pace, lay out a 100-foot measuring tape, and count every other step, remember to walk normally so your pace is accurate.

Formula: 100 / number of paces = one pace

Rangefinder

Set mode to 'HOR'

Accurately aim at a target (a person standing directly under the dipline) using the laser point and the viewfinder. Calibrate to find distance. Press the button and then you can conveniently read the result on the display.

Field Challenges: Drip line behind a fence, in a busy street, and intermixed canopies. Provide your best estimate.

Rounding: For this program: we round to the nearest foot (the nearest whole number) when recording Crown Spread.

- For measurements 0.1 - 0.4 = round down
- For measurements 0.5 - 0.9 = round up
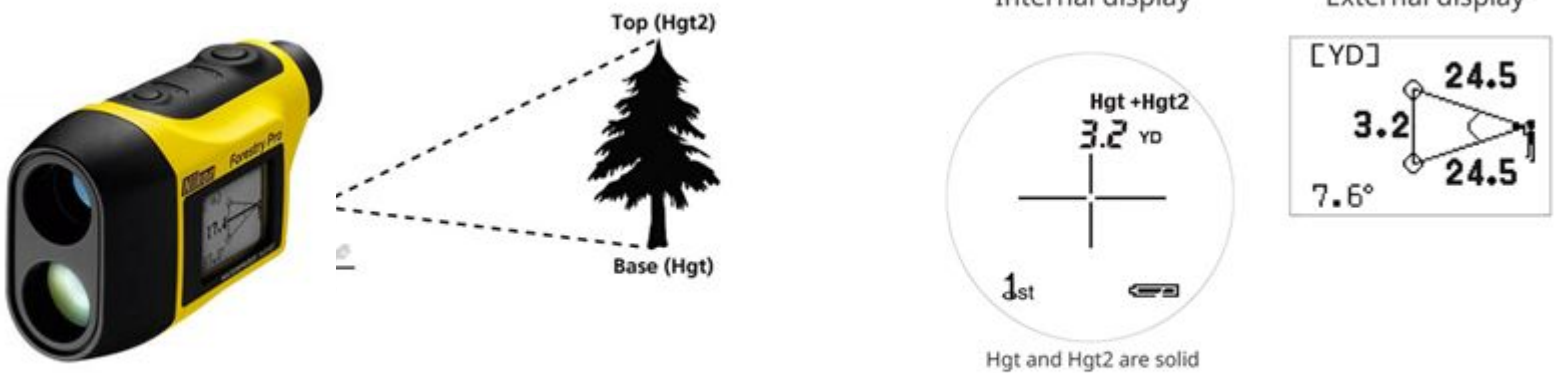
Tree Assessments

Tree Height

Goal: Learn how to determine the height of a tree and measure using various methods

Definition: For this program, tree height begins at the ground level trunk (or stem) to highest point of the tree above ground level (the highest terminal branch tip).

Methods: Hypsometer, Stacking Method, Stick Method, Pencil Method

Laser Hypsometer or Rangefinder

Measurement example (two-point height measurement)

Top (Hgt2)

Base (Hgt)

Internal display

Hgt +Hgt2
3.2 YD

1st

Hgt and Hgt2 are solid

External display

[YD]   24.5
3.2
7.6°   24.5

When the measurement is successful, you see the height from the base to the top displayed on the internal LCD with **Hgt+Hgt2** (solid).
For more information, refer to the external LCD.
"Base" and "Top" can be switched.

Stacking Method

Have a team member stand next to the tree. Approximate the size of your team member by measuring their height with your hand, then stack their height to the top of the tree. Multiple the number of stacks by their height.
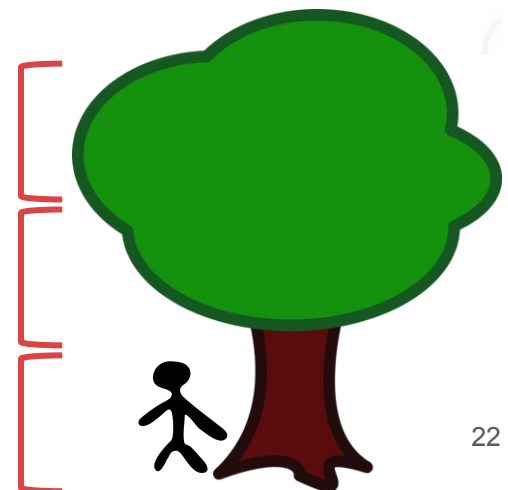
Tree Assessments

Live Crown Ratio

The "Shaka"

Goal: Accurately estimate the size of the crown as a percent of the total tree.

Purpose: By determining the crown ratio, we are able to estimate the "food" gathering potential of a tree, since all of the photosynthesis happens in the leaves!

Definition: For this program, Live Crown is the amount of height of the tree that is composed of live crown: branches and foliage.

Methods: The "shaka" estimation

For this program, we record live crown ratio using the nearest estimate of the following percentages: 0%, 25%, 33%, 50%, 67%, 75%, >75%

Notes: Learning species-specific growth pattern may help to determine a pattern of abnormality from natural species form.

25%

33%

50%

Crown (50%)

Height (100%)
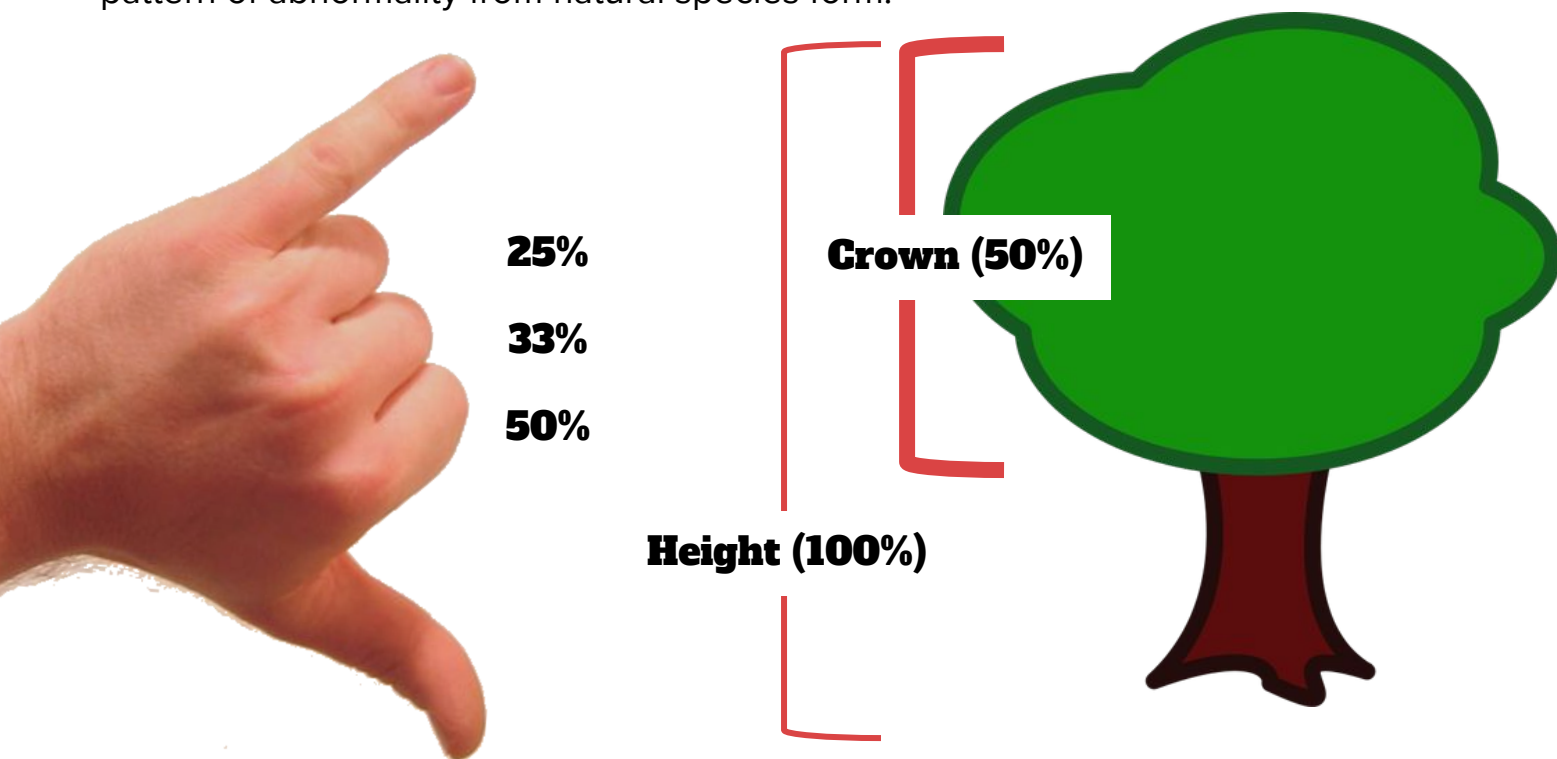
Condition

The Canopy Method

Goal: Accurately determine the overall wellbeing of the tree

There are many ways to assess tree condition. For this program, we use **"The Canopy Method."** This method considers:

- *Leaf color* (species and seasonal variation) - From healthy vibrant color to chlorotic or browning. Dark green leaves for mango, lighter green for true kou and reddish brown on the underside of a satin leaf tree leaf.

- *Leaf size* (species-specific) - The size and shape of the fully grown leaves as compared to normal for the species. Look for well-formed leaves.

- *Leaf density* (species and seasonal variation) - The density of leaves in the canopy during full-leaf season.

- *Dieback of branch tips* – The general volume of dead tips on branches throughout the crown. This can also be used for broadleaf trees during dormancy.

- *Shoot growth* (species and age specific) – The length of new growth compared with normal, annual growth, generally identified at the ends of branches with green stems.

Other Conditions to Add In "Comments":

The following are basic risk assessment observations to flag for an Arborist check:

- Large dead branches (>2" diameter and 3' length)
- Unusual leans that includes mounding soil on backside of lean and > 45 degrees leans regardless of compounding conditions
- Areas of cavity or decay that exceed 30% of basal area of stem/branch
- Recent splits/cracks in main trunk or large scaffold branches

24
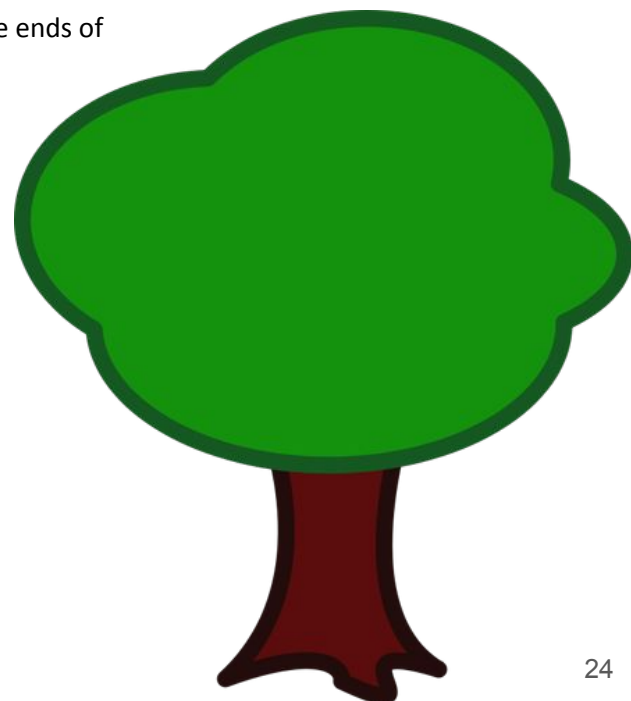
Tree Assessments

Tree Status

Stumps and Dead Trees

Goal: Locate where potential trees may be suitable for planting.

There is no need to collect any tree assessment data for stumps.
Record:
- Tree Status: "Stump", or "Dead"
- Common Name: "Stump" or "Dead Tree"

You should still collect location information (growing space, wires, etc).
If there are still alive shoots present on the tree, it should be recorded as "Alive", in POOR condition.

Photos

Please take photos to record the following:
- Document a problem (e.g. any conditional problems mentioned in the previous "Condition", any vandalized trees, pest infestations, etc)
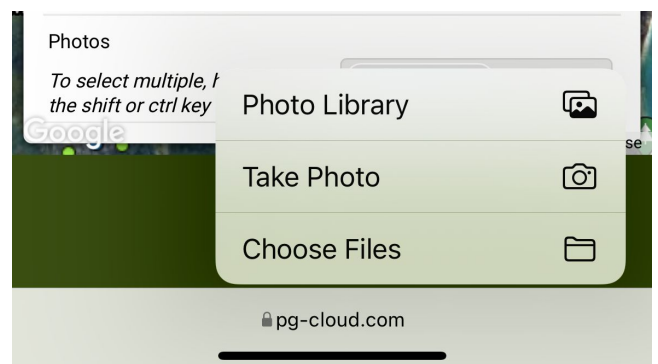- For help to identify a species.

Photos are not required for every tree, but can be helpful for management!

To take proper photos for identification:
- Take up-close photos of key features such as: the **bark and leaves**, **pods** and/or **flowers**.
- Use your measuring tape to show scale.

Take photos or upload directly to to Tree Plotter

Tree Assessments

Exceptions

Palms

Palms provide less ecological benefits to the environment than trees do due to their biological composition. They are more closely related to grass than trees. Thus, there are some standard measurements we record for palm trees.

Live Crown Ratio: 25%
Density: 0-25%

Dieback is usually 0%
Areca palms do not need to be recorded for this inventory.

Groves

Occasionally, we come across __*maintained*__ areas of trees that are growing in close proximity that are difficult to inventory. In these cases, the goal is to still capture measurements that will best reflect the ecological benefits of the trees, particularly the species type, DSH, and land use information. Groves are an option within Tree Plotter, but they do not calculate the ecological benefits of the trees.

Follow these tips for best measurements:

- Use the multi-stem calculator

    - Collect DSH of up to 6 trees and plug numbers into calculator. (Consider DSH at ground level if each tree is a multi-stem tree.

    - Approx other measurements from that area of crown spread.

*If the area is *unmaintained*, it does not need to be inventoried.

Location Information

Land Use

This field is required to calculate ecological benefits

How is the land being used in proximity to the tree?

Land Use

Single family
Multi-family
Commercial
Industrial
Large Industrial
Park
Vacant Lot
Other

Growth Space

The "Growth Space" category documents the type of space the tree is growing.

For any trees in parks should be marked as "Bare Soil", unless the growing space is otherwise obvious, such as a planting strip or tree well. When in doubt, mark it as bare soil rather than leaving it blank.

Growth Space

Unimproved sidewalk
Planting Strip
Tree Well
Metal Grate
Plastic Grate
Bare Soil,
Loose Aggregate
Other

Location

This assessment is in relation to the "address" of the tree, from the **perspective of a maintenance worker** (not the homeowner) at the road.
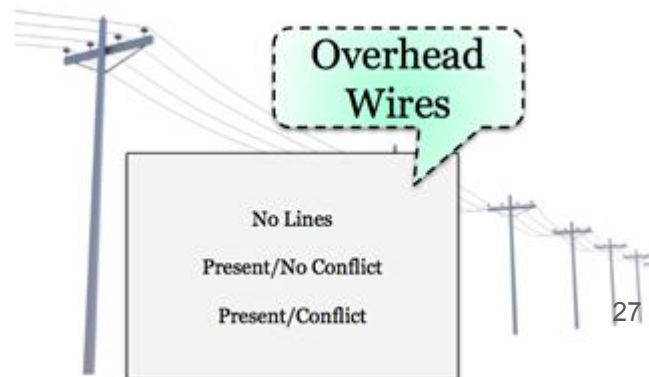
Location

Front
Rear
Left
Right
Park

Wires

"Present/Conflict" when overhead wires are come in contact with the tree or if the wires are within 10 feet of the tree.

If the overhead wires are further than 10 feet from the tree, mark "Present/No Conflict"

Overhead Wires

No Lines

Present/No Conflict

Present/Conflict

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Potential Planting Sites

Site Criteria

Space to Grow

❑ Is there at least **10 ft of clearance** from any utilities?

> Ie. Power or Communication lines, Service lines to homes, Street lights, Fire hydrants, Storm drains, Water meters, Gas lines

❑ Are there **no conflicts**?

> i.e. existing landscaping, existing trees, existing infrastructure

❑ Is the **surface permeable**?

> i.e. green space, gravel, soil, porous surfaces

Location

❑ Is the site within the **City Right-of-Way** or **City Park**?

❑ Is the site adjacent to a **single property**?

> (This helps to to avoid future conflicts)

❑ Does the site allow for necessary **infrastructure**?

> (i.e. street lights, signals, traffic signs, etc)

✔ **This is a potential planting site!**
Lets map it.

Data Collection

❑ GPS Location Tree Plotter
   ○ Log in
   ○ Select your "Organization"
   ○ Find Your Location
   ○ **"Add a Tree"** as normal
      ■ **NEW Template:** Select **"Proposed Planting Site"**

❑ Photos

❑ Site Size (width & length)

❑ Location Status (proposed site- S/M/L)

❑ Land Use

❑ Location (from perspective of the address)

❑ Growth Space

❑ Utilities (wires)
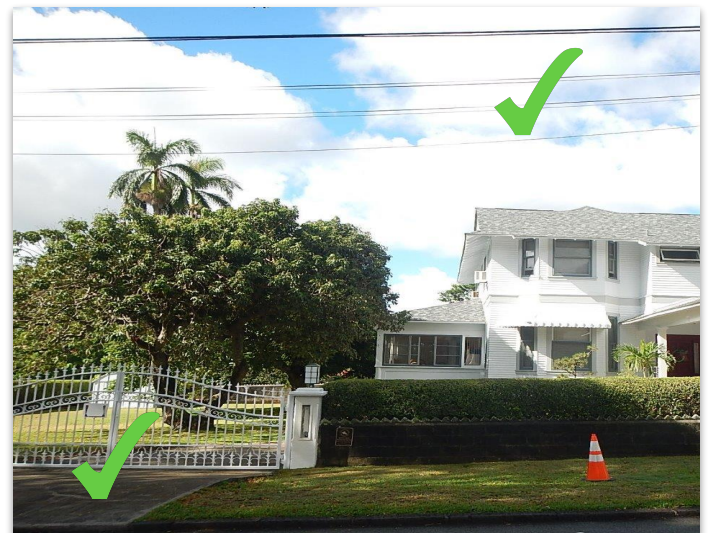
Overview

- **Plant Names**
  - Scientific and Common Names
- **Species Classifications**
  - Native
  - Introduced
  - Invasive
- **Observational Skills**
  - Leaves
  - Bark
  - Tree Crown Shapes
  - Other Tree Characteristics
- **Unknown Tree Species**
  - Unidentifiable Tree Form
  - Tree ID Cards
  - Outside resources
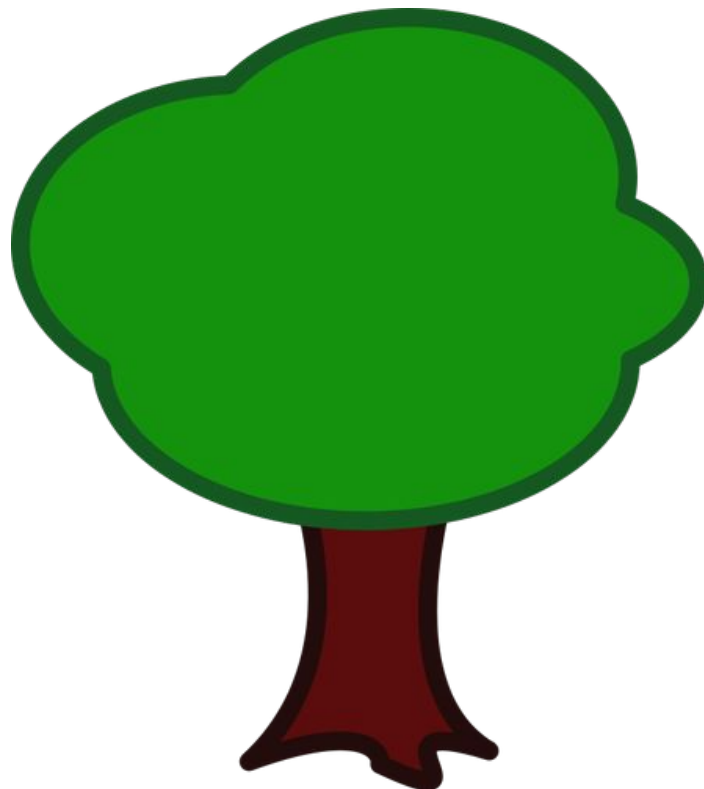
Plant Names

Scientific Name:
Cocos nucifera

Common Name:
Coconut Palm

Local Names:
Niu, Iru, Niyok, Coco

Common Name

For this Program, we record "Common Name".

This is decided upon by how the managing agency classifies the species. This does not mean other known names are wrong! (In the online inventory, trees can also be searched for by the scientific names.)

The colloquial or popular name for plants that is used locally and often varies by region or country. For example, coconut palms are native to many areas around the world. In English, their common name is "coconut palm" or "coconut tree", however, this is not the only current common name. In Hawaii the same plant is called **Niu**, in Palau it can be called **Iru**, and in Guam, **Niyok**.
Common names are important because they often give clues to the cultural uses or easily identifiable characteristics of a certain plant.
For example, the seeds of the Kukui (or Candlenut Tree) contain flammable liquids that can be used to create light (among other things).

HOWEVER, common names are not always useful for identifying specific plants because they are very general and do not always accurately describe their traits or relationships to other plants. *For example,* Mountain Apple (Syzigium malacense) is not actually related to the Common Apple (Malus domestica). These plants probably have similar common names because their fruits are edible and can be used in some of the same ways. To avoid this confusion, botanists use scientific names.

Scientific Name

Unique names used by the scientific community to accurately and universally identify species . Taxonomists have established "scientific nomenclature" as a universal protocol to help avoid ambiguity and ensure consistency across regions. This nomenclature groups organisms together in a hierarchy that helps to describe shared traits amongst species. These traits are helpful for identification as well as understanding the specific growth conditions of each plant. Scientific names can be long, but usually plant species are referred to by the two most specific components of their name: Genus and species.

*NOTE: The genus and species of organisms are always italicized.

Tree Identification

Species Classification

Native

Arrived at geographic location via the **3W's: WIND, WATER, & WINGS**; *without* human intervention.

- **Indigenous**: Native to more than one place
- **Endemic**: Species that exist **in only one** geographic region

EXAMPLES: Hala, 'Ohia, Koa

Polynesian Introduced 'Canoe Plants'

Roots, cuttings, shoots, & seeds **brought by Polynesian voyagers on sailing canoes** for food, medicine, clothing, building, entertainment, and spirituality.

EXAMPLES: Coconut Palm, Kukui, 'Ulu, Milo

Introduced

Arrived at geographic location **with** human intervention

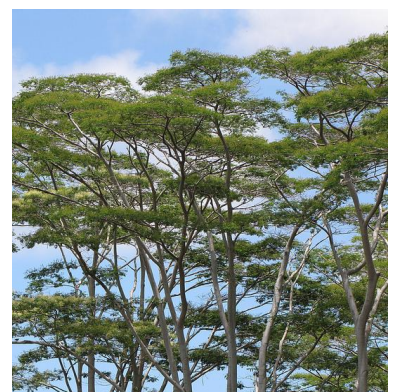EXAMPLES: Shower trees, Pink Tecomas, Monkeypod, Plumeria

Invasive

- Non-native (or alien) to ecosystem
- Causes or is likely to cause harm to economy, environment, and/or human health.

EXAMPLES: Albizia, Octopus Tree, African Tulip Tree, Ironwood, Kiawe

Tree Identification

Observation Skills

Tree identification can be done by several parts of the tree. Often times the leaf orientation will be a key indicator of species type.

There are several tools available to help you identify Pacific Island trees in the field.

1. **Tree Identification Cards**

Team leaders will be equipped with Tree Identification Cards. Remember, the cards are not comprehensive, you will most likely encounter species not on this list!

2. **Pacific Island Tree Key** and **SelecTree**

This online tool is specifically created for Pacific Island tree identification and selection. This is a great reference in the field for confirming tree identification or working through their **dichotomous key**.

Think you know, but not 100%:

If you think you know the species of tree, but want confirmation, please do the following:
- Label the common name as "**Unknown**"
- Take photos like you are taking them for an unknown species
- In tree comments, include your guess/thoughts and the phrase "Tree ID needs Confirmation".
- Labeling the species as *unknown* is important, so we know to look it up in Tree Plotter later.
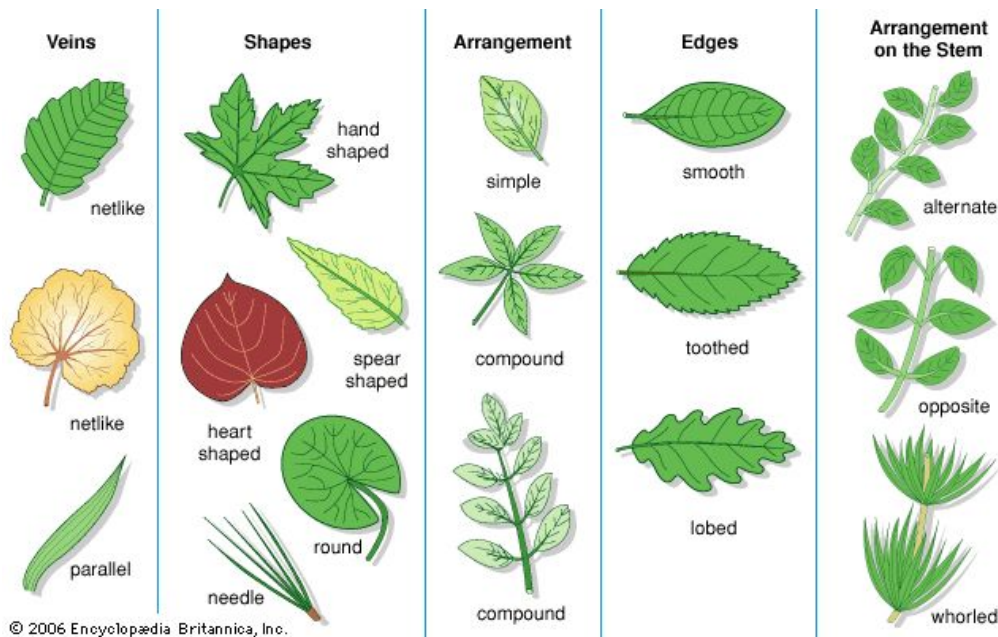
Leaf Morphology

Leaf Shapes
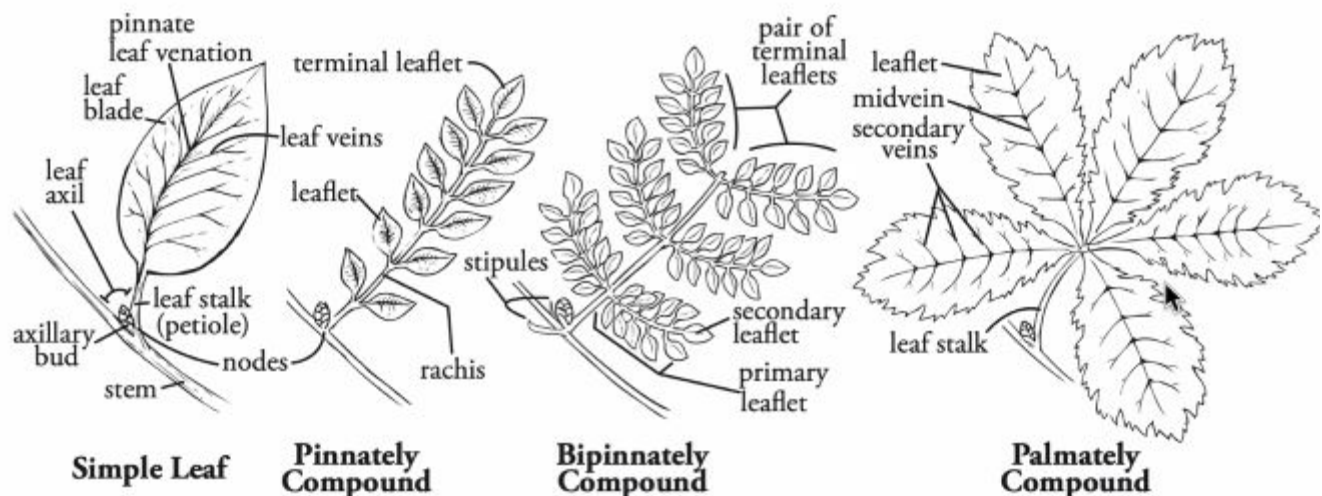
Observation Skills

Leaf Morphology

Studying the different shapes and designs of leaves is an important tool to identifying plant species. It describes the shape, color and arrangement of a plant's leaves including any of the various forms that leaves assume and any observable leaf structural components (such as vein alignment, color, or texture). Recognizing and categorizing the overall shape of the leaf, the outer edge of the leaf (leaf margin) and the pattern of leaf veins are key to developing strong observational skills.

FUN FACT: Botanists commonly use scent as way to determine a plant species.

Veins
netlike
netlike
parallel

Shapes
hand shaped
spear shaped
heart shaped
round
needle

Arrangement
simple
compound
compound

Edges
smooth
toothed
lobed

Arrangement on the Stem
alternate
opposite
whorled

© 2006 Encyclopædia Britannica, Inc.

Crown Shape

The crown shaft is the shape that a tree's branches grow into. This general shape can vary by species and can be indicative of certain trees. Trees can be conical, weeping, umbrella like, or any number of other shapes. Being able to identify crown shaft can help direct a species ID.

NOTE:
Don't forget that crown shapes refers to how a tree grows naturally without interference. Many street trees are regularly maintained by arborists who intentionally shape trees to decrease their hazard potential. Keep this in mind if you use crown shape to determine tree species.

Crown Shapes

Rounded
Weeping
Vase- to Funnel-shaped
Tabular to Spreading
Columnar to Conical
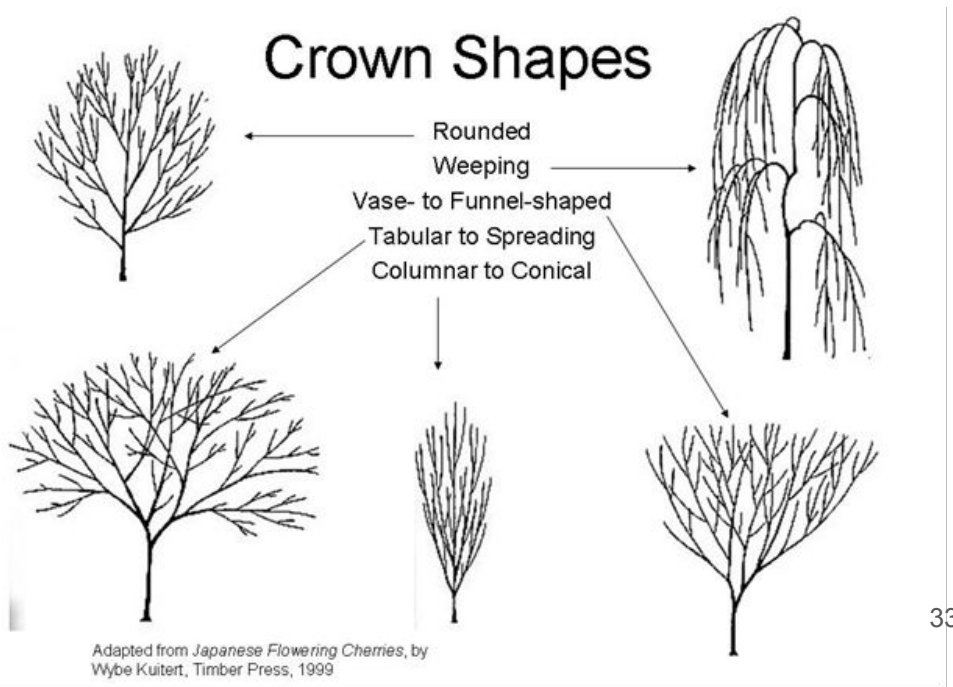
Adapted from *Japanese Flowering Cherries*, by Wybe Kuitert, Timber Press, 1999

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CITIZEN FORESTER PROGRAM

Observation Skills

Fruit Type
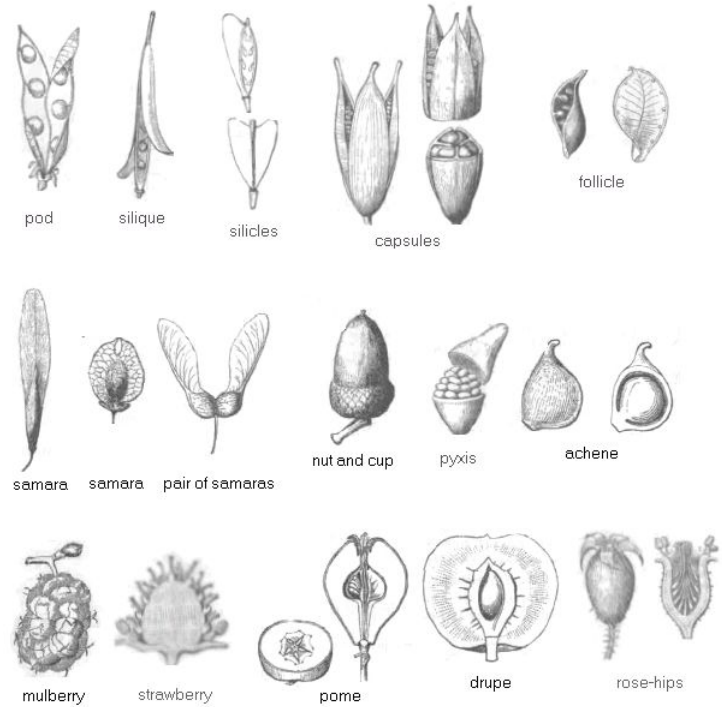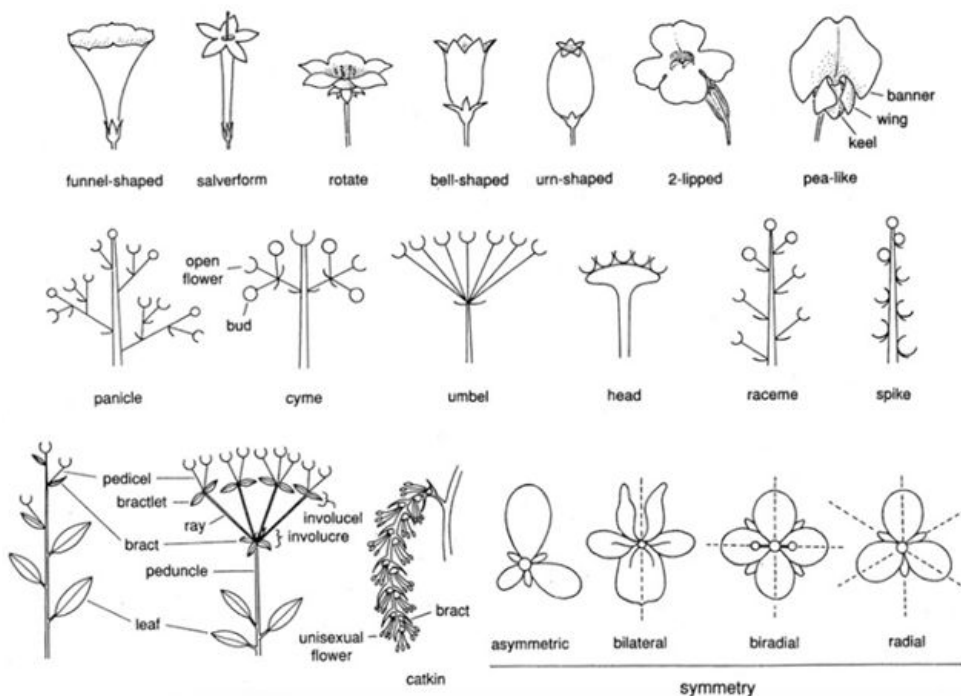
Fruit type is is key to species ID and can be extremely variable. Fruit type is determined by the arrangement of seeds, the number of individual fruits, if the fruit is fleshy or has a stiff outer seed coat--to name only a few characteristics. Many of us think of fruits, only as the edible components of plants, but most fruits are actually dispersed in a way that doesn't require them to be palatable. For example, buoyant fruits can be transported by water and therefore don't need to be consumed by a host.

FUN FACT: What about seed pods, you ask? Seed pods are actually considered the fruiting body of their associated plant because they encase and protect their seeds just like the fruit of a peach!

pod   silique   silicles   capsules   follicle

samara   samara   pair of samaras   nut and cup   pyxis   achene

mulberry   strawberry   pome   drupe   rose-hips

Flower Type

funnel-shaped   salverform   rotate   bell-shaped   urn-shaped   2-lipped   pea-like   banner   wing   keel

panicle   open flower   bud   cyme   umbel   head   raceme   spike

pedicel   bractlet   ray   bract   peduncle   leaf   involucel   involucre   bract   unisexual flower   catkin   asymmetric   bilateral   biradial   radial   symmetry

Flower type is one the most important characteristics for determining a plant's species. This includes the color, number, and shape of petals as well as length and style of pistils and stamens. Flowers contain the reproductive organs of plants and the arrangement of these organs is paramount to the way the plant attracts pollinators and produces offspring. Once pollinated, flowers become fruits (which are also important for identifying plant species).

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Tree Identification

Observation Skills

Bark Type

The color, texture and orientation of bark can be helpful in identifying certain tree species. The graphics below show examples of bark type and their corresponding names. Be aware however, that bark can appear differently on an individual tree over its lifetime. For example, a young tree may have smooth bark until it matures at which point, its bark can become rough. Certain types of environmental pressures can also influence bark type. Although helpful, bark type should be considered in relationship to other physiological characteristics to determine species.

Smooth Lenticels Peeling strips Vertical cracks Scales

Plates Vertical strips Intersecting ridges Ridges broken horizontally Uninterrupted ridges

From left to right: Royal, Pygmy Date, Aiphanes, Alexander, Fiji Fan, Manila, Coconut

FUN FACT: Palm trees are not true trees because they do not develop cambium, an important component in bark. Therefore, palms don't actually form bark at all! However, they do have regular variation in trunk texture and shape which can still be helpful for identification (Learn more here).

Tree Identification

Species List

from Guam's Forest Resources: Forest Inventory and Analysis, 2013.
To read [full report, click here](#)

Scientific and Common Names of Plants Found During Inventory

Life form	Scientific name	Common name
Trees:	*Adenanthera pavonina* L.	kulalis
	Aglaia mariannensis sensu Kaneh., non Merr.	mapunyao
	Annona muricata L.	laguaná, kasoy, soursop
	Annona reticulata L.	annonas, custard apple
	Areca catechu L.	puguá, betel nut
	Artocarpus altilis (Parkinson) Fosberg	lemmai, breadfruit
	Artocarpus mariannensis Trécul	dugdug, seeded breadfruit
	Averrhoa bilimbi L.	bilimbi, pickle tree
	Barringtonia asiatica (L.) Kurz	puting, fish kill, sea putat
	Barringtonia racemosa Roxb.	langaasag
	Bauhinia monandra Kurz	orchid tree, mariposa
	Calophyllum inophyllum L.	da'ok
	Cananga odorata (Lam.) Hook. f. & Thomson	ilang-ilang
	Carica papaya L.	papaya
	Casuarina equisetifolia L.	gagu, ironwood
	Cerbera dilatata Markgr.	chiute
	Chrysophyllum cainito L.	star apple
	Cocos nucifera L.	niyok, coconut palm
	Cyathea lunulata (G. Forst.) Copel.	tsatsa, Pacific tree fern
	Cycas circinalis L.	fandang, federico
	Eugenia palumbis Merr.	agatelang
	Eugenia reinwardtiana (Blume) DC.	a'abang
	Eugenia thompsonii (Merr.) N.Snow	atoto

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Species List

Scientific and Common Names of Plants Found During Inventory (continued)

Life form	Scientific name	Common name
	Ficus prolixa G. Forst.	Nunu, fig
	Ficus tinctoria G. Forst.	hoda, tagete, fig
	Glochidion marianum Müll. Arg.	*Glochidion marianum*
	Guamia mariannae (Saff.) Merr.	paipai
	Hernandia ovigera L.	oschal
	Hernandia sonora L.	nonak, mago
	Heterospathe elata Scheff.	palma brava
	Hibiscus tiliaceus L.	sea hibiscus, pago
	Inocarpus fagifer (Parkinson) F.R. Fosberg	budo buoy, Tahitian chestnut
	Intsia bijuga (Colebr.) Kuntze	ifit
	Kleinhovia hospita L.	guest tree
	Leucaena insularum (Guill.) Daniker	native tangan tangan
	Leucaena leucocephala (Lam.) de Wit	tangan tangan
	Macaranga thompsonii Merr.	pengua
	Mammea odorata (Raf.) Kosterm.	chopak
	Mangifera indica L.	mångga, mango
	Maytenus thompsonii (Merr.) Fosberg	luluhut
	Melanolepis multiglandulosa (Reinw. ex Blume) Rchb. f. & Zoll.	alom
	Morinda citrifolia L.	lada
	Neisosperma oppositifolia (Lam.) Fosberg & Sachet	fagot
	Ochrosia mariannensis A. DC.	langiti
	Pandanus dubius Spreng.	pahong
	Pandanus tectorius Parkinson ex Zucc.	kafu, kaffo, Tahitian screwpine
	Pisonia grandis R. Br.	amumo
	Polyscias grandifolia Volkens	pepega
	Premna obtusifolia R. Br.	ahgao, premna
	Spathodea campanulata P. Beauv.	African tulip tree
	Tabebuia pallida (Lindl.) Miers	pink tabebuia
	Tarenna sambucina (G. Forst.) Durand	sumac-lada
	Triphasia trifolia (Burm. f.) P. Wilson	lemondichina
	Tristiropsis obtusangula Radlk.	faia, faniok
	Vitex parviflora Juss.	smallflower chastetree

Lazaro, Michelle; Kuegler, Olaf; Stanton, Sharon; Lehman, Ashley; Mafnas, Joseph; Yatskov, Mikhail. 2020. Guam's forest resources: Forest Inventory and Analysis, 2013. Resour. Bull. PNW-RB-270. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 43 p.

Data Entry

Login On

Plan-It Geo is a geospatial forestry firm based out of Arvada, Colorado. They supply and host tools to successfully manage urban forests, educate and motivate the public, and plan for the future. The Citizen Forester Program uses their Tree Plotter software to host Hawaii's urban tree inventory.
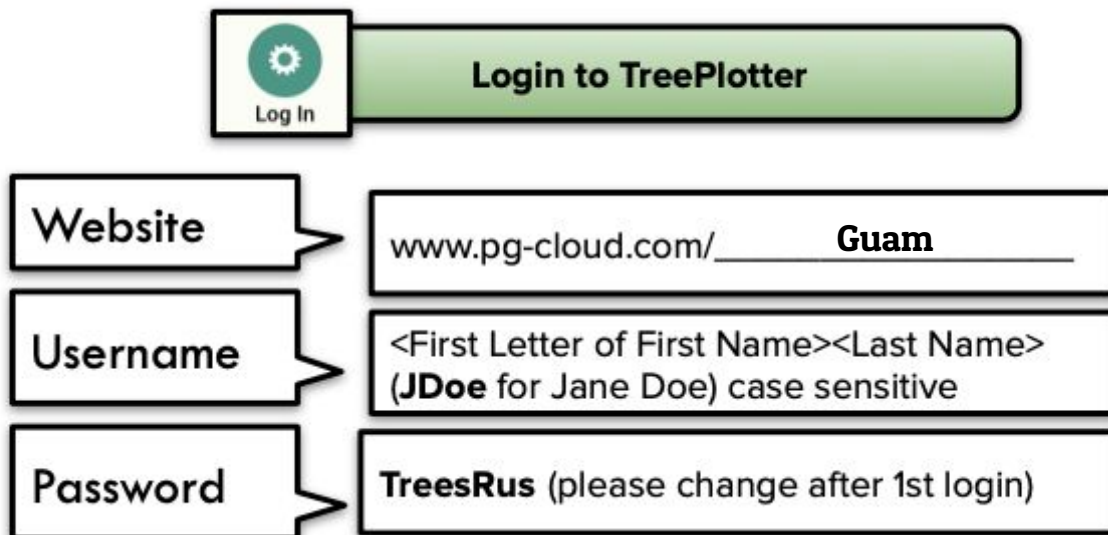
Tree Plotter©

Tree Plotter is a web-based tree inventory software application designed for inventorying, managing, and informing decisions about trees. The application can be used to manage public or private trees in an online map. Tree Plotter replaces traditional GPS-based inventory programs with GIS and web cloud-hosting technologies. It can be used with any device with Internet connectivity (Mac, Windows, Android, etc.). It provides a read-only map viewer for the public as well.

There are three technological components for the data collection of tree inventory data:
1. **GPS** - use to locate the tree or a Satellite map of the data collection area. (location service)
2. **World Wide Web** - to display the location and enter the tree information (browser)
3. **Cellular Data service** - access the inventory database at Plan-it Geo (Phone data service)

Plan-it Geo's YouTube channel *There are several video tutorials for your reference. Please note the plan-it Geo web site is constantly improving, some of the screens and steps may not perfectly match the video*

Login to TreePlotter
Log In

Website → www.pg-cloud.com/_____Guam_____

Username → <First Letter of First Name><Last Name> (**JDoe** for Jane Doe) case sensitive

Password → **TreesRus** (please change after 1st login)

Data Entry

Device Orientation

iPhone Orientation

If you have access to multiple 'organizations', you will need to **"Load Trees"** before adding a tree.

Zoom in & out
Home
Your Location
Find an Address
Advanced Filter
Map Settings
Help / Support

LOAD TREES   DATA TABLE

ADD TREE
MOVE TREE

Screen Orientation

Desktop orientation

Data — TREES / ORGANIZATIONS

"Hub"

Zoom in & out
Home
Your Location
Find an Address
Advanced Filter
Map Settings
Help / Support

Add a Tree
Move a Tree
Log in & out

Trees

Legend

Report an error

Data Entry

Add a Tree

Add a Tree to the Inventory

On a Smartphone, Tablet or Computer: Go to the Tree Plotter website: www.PG-CLoud.com/_____ & Log In with your username: JDoe (First Initial, Last Name - case sensitive) & Password: TreesRus

Select "_____" as the Organization in the Legend

Shrink the Legend by Clicking: <bottom arrow>, you can bring the legend back up with the icon shown on the left <-

Find your Location by Clicking: <GPS Icon>
(Your location settings may need to be adjusted in your device settings)
Click it again to clear the GPS ring

"Find an Address' by Clicking: <Globe Icon>

Enter Address: _____

Pan & Zoom in ➡ look for a tree ➡ pick any tree in Ala Moana Park.

Add a tree by Clicking "Add" <Pencil Icon> from upper right
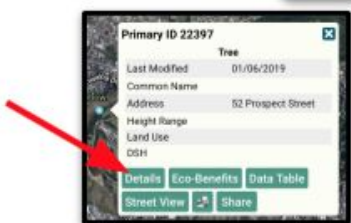
Select "Tree" from Pop up "Template" Menu

Touch the Tree You've Chosen on the map, and a window should appear. Note the Primary ID #

Careful, every touch to your screen will create another tree. To stop adding, and to move around the map - Click the <stop icon> in the upper right, shown on the left <-

Enter Data

Enter data into the inventory:

Click on the Tree you just added. A pop up window should appear. Click <Details>

Details

A similar Popup window will appear when you create a New Tree.

Enter the following fabricated information into the data fields.
Take your time to get to know the fields.

Tree Information | **Location Information** | **Management Needs**

Tree Information

Status	<Alive>
Common Name	<Monkeypod>
DSH	<34>
Height Range	<57>
Number of Stem	<1>
Crown Spread L	<120>
Crown Spread S	<84>
Live Crown Ratio	<33>
Density	<75 >
Condition	<Good>
Percent Dieback	<None>
Comments	< Trashcan chained to Trunk>

Location Information

Land Use	<Park>
Growing Space	<Park>

Management Information

Wires	<Present no conflict>

Close Close AFTER you enter the above information

Move and Delete

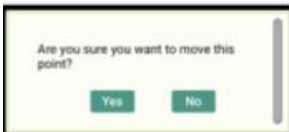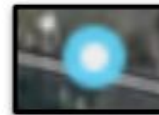**Move a Tree in the Inventory**

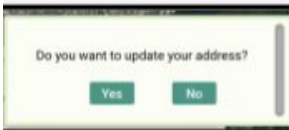Let's move the Tree you just added, (in case the tree was added a bit off the canopy image)

MOVE

Move Tree by clicking <Move Icon> from the upper right

(Which will deselect "Add")

ADD   MOVE   LOG OUT

Click & Drag your white tree dot
(it should outline in blue)

Are you sure you want to move this point?
Yes   No

Click <Yes> when asked "Are you sure you want to move this point?"

Do you want to update your address?
Yes   No

Click <Yes> when asked "Do you want to update your address?"

Your Tree is Moved!

MOVE

Click the <stop icon> in the upper right to stop moving Trees

Delete a Tree in the Inventory

Let's delete the Tree you just added, (in case a tree was added by mistake)

Details

Click your white tree dot

Popup "Primary ID" window should appear

Click <Details> in bottom left

Primary ID 22397
Tree
Last Modified   01/06/2019
Common Name
Address   52 Prospect Street
Height Range
Land Use
DSH
Details Eco-Benefits Data Table
Street View   Share

Delete

Click <Delete> in the upper left

Tree Details
Delete   Close   Load Last

Are you sure you want to delete this? This cannot be undone.
Yes   No
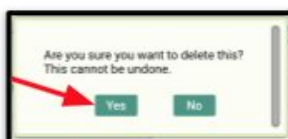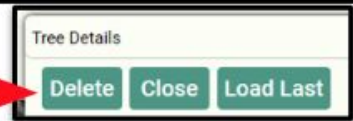
Click <Yes> when asked "are you sure you want to delete this? This cannot be undone." to confirm deletion.

Your Tree is Deleted! & You are done with the exercise!

Data Entry

Offline Version

Training Video

This feature will be used primarily used by a team leader planning a mapping session for an area where there is no cell coverage.

The area needs to be saved offline BEFORE the mapping session.

Zoom in & out

Find an Address

Your Location

Map Settings

OFFLINE 2.65

Login

Save Map

Add Tree

Sync

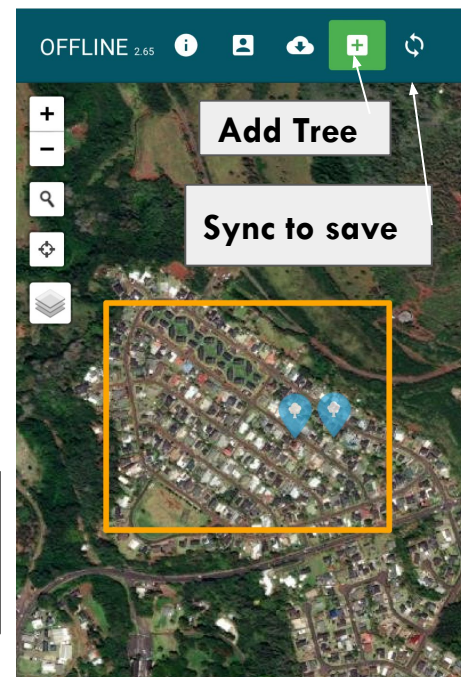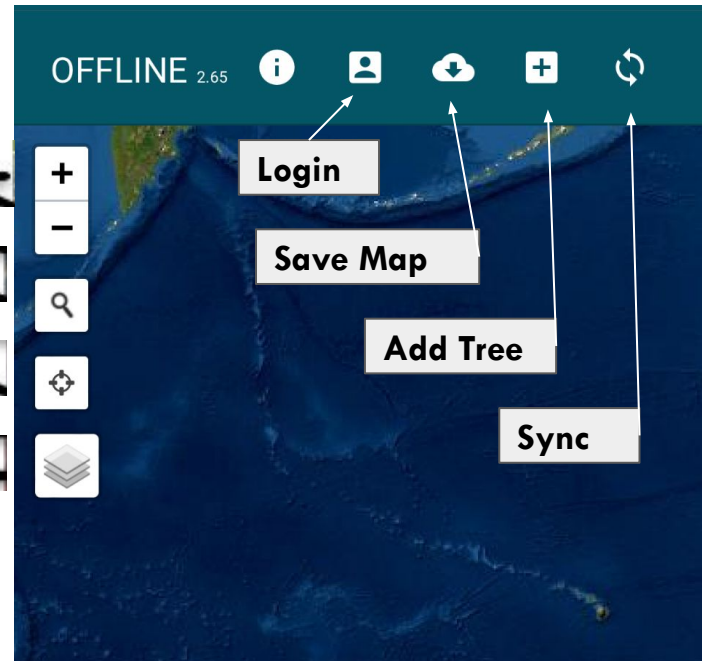Save Map

Select the Area and Organization

Lihue

Add Tree

Sync to save

Tree Planting

Planning ahead is the most important step you can take to ensure that the time and money you invest in planting a new trees is well spent. The key to successful landscaping is to plant *the right tree in the right place*.

What will the tree look like when it is mature? Above all, find out how tall and what shape your tree will be when it is fully grown to make sure that fits in the space and purpose you have for the tree.

Visit the [US Forest's Tree Owner's Manual](#) for a complete guide to planting
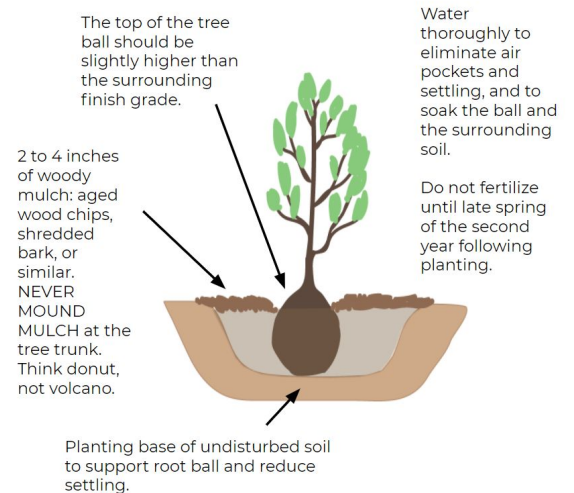
Selection

Site assessment
- Are there growth obstacles for the crown, trunk and roots?
  - Structures, walks, overhead and underground utilities, etc.
- What are the soil, water and light conditions? Will these conditions be suitable for this species?
- Can the tree thrive on this site for many years?

Installation

- Dig the hole 2-3x as wide as the rootball, and 90% as deep as the rootball.
- Backfill with parent soil
- Water to reduce air pockets
- Ensure roots spread
- *If staking,* use root support system
- Mulch!

The top of the tree ball should be slightly higher than the surrounding finish grade.

2 to 4 inches of woody mulch: aged wood chips, shredded bark, or similar. NEVER MOUND MULCH at the tree trunk. Think donut, not volcano.

Water thoroughly to eliminate air pockets and settling, and to soak the ball and the surrounding soil.

Do not fertilize until late spring of the second year following planting.

Planting base of undisturbed soil to support root ball and reduce settling.

Early establishment

Monitor general condition and well-being **weekly for first 3 to 6 months**
- Water needs
- Structural Pruning
- Weed management
- Mulch management,
- Insect and disease signs and symptoms

Long-term care

Monitor general condition and well-being **monthly for life of tree**
- Structural/corrective Pruning
  - Minimum pruning for safety and obstacle clearance *as required*
- Protection from damage
- Mulch management
- Weed management

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Interacting with the Community

CITIZEN FORESTERS ARE THE VOICES FOR OUR TREES!

An important component of the Citizen Forester program is communicating with the public. Urban foresters work in urban areas; "urban" by default means people will be around!

Citizen Foresters spend time on the streets, in parks, neighborhoods and communities with tree equipment and data sheets, looking up at and mapping public trees – sometimes that attracts attention!

We use this opportunity to spread the message of our urban forests.

While interacting with the community is mostly positive and fun, we want all of our ambassadors to feel comfortable and safe!
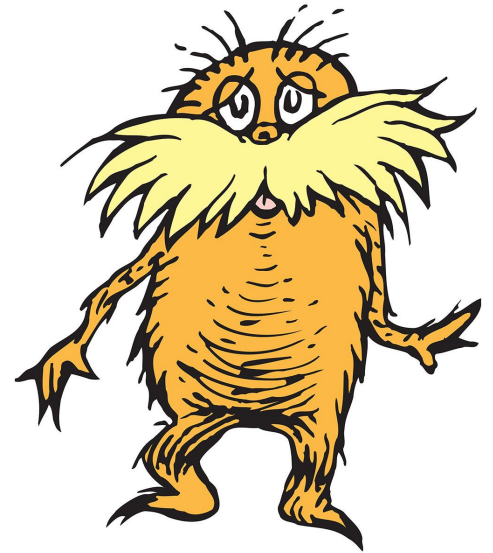
Defining Your Message

Citizen Foresters are often approached by community members, which provides a fun opportunity to educate your neighbors on the importance of our urban forest. Be sure to have an "elevator pitch" ready when someone asks you..

"Why are *you* mapping Trees?"

COMMON "AUDIENCES":

It may be appropriate to adjust your message depending on the audience.

- Residents
- Tourists
- Business Owners
- Home Owners

OUTREACH MATERIALS: Informational and educational hand-outs will be provided to each team leader to have on hand for each meetup that allows broad distribution to a large audience. Material can not only be used actively during outreach activities, but also given individually to people interested when out in the field.

REMAIN PROFESSIONAL. Please remember, while out in the field, you are representing the program and we ask you always remain professional.

PLEASE REPORT any abnormal interactions to program staff in your mapping report. Your team leader will be trained on this. Refer to your informational cards if anyone has questions about the program, and of course, have fun!

Interacting with the Community

Tips!

Tip #1 Make a Plan:

Assess your safety first and foremost. If you are uncomfortable in any way, let someone know. Have a plan in place with your team to leave or report the situation.

Tip #2 It's OK Not to Know:

People will surprise you with the questions they have about trees! You don't need to try and answer any questions you may not have the answer to, it is better if you are able to point them in the right direction to get the right answer instead.

Tip #3 Not Every is Going to Like Trees:

Yes, it may seem crazy to think that some people dont like trees, but its true! It may be a good opportunity to share why trees should be loved – but if you are dealing with someone who is unhappy with our activity, program or who is looking to cause a problem. It is best to kindly leave the conversation and/or the location.

Tip #4 Practice your Pitch:

What do *you* want people to know about trees? What is *your* message? This program gives volunteers a great platform to share your message with the community. Remember, this might be different depending on who you are interacting with.

FAQ & Example Responses

Question	Response
What is the Citizen Forester Program?	The Citizen Forester program is a community project that trains, certifies and supports volunteers to collect urban tree inventory data. (Hand them a postcard)
Do you work for the City? Who do you work for?	All Citizen Foresters are trained volunteers. The Citizen Forester program is a collaborative project of federal, state, and city partners, including: State and Private Forestry branch of the U.S. Forest Service, DOFAWs Kaulunani Urban and Community Forestry Program, the nonprofit Smart Trees Pacific and the Urban Forestry Division of the City and County of Honolulu. (Hand them a postcard)
Who do I call if I have a problem with my tree? A tree on my street?	The Urban Forestry Division of the City and County of Honolulu has several numbers for tree related inquiries. (Hand them a postcard and/or point them to Honolulu.gov)
Why are you mapping my tree? Why are you on my property?	Our volunteers should NEVER be on private property. The Citizen Forester program only maps trees in the city's "Right-of-Way". We ONLY work in public spaces and work from a map provided by the city. Sometimes it is difficult to distinguish a city-owned tree from a private tree, but our volunteers are trained to assess this. We are happy to share with you how we map and why its is important! (Hand them a postcard)
How can someone join the program?	The program offers trainings throughout the year. We are always happy to have more volunteers join the program. You can sign up online. (Hand them a postcard)

Safety Awareness

- Citizen Foresters don't map in construction zones, blindspots, busy roads without sidewalks, etc.

- Citizen Foresters are requested to wear provided t-shirts for visibility (Safety vests are also available).

- Citizen Foresters work in groups. We have a minimum of three (3) volunteers for a meetup to run.

- Team Leaders will designate a safety person during each session, and will hold a first aid kit.

- Citizen Foresters don't map in poor weather conditions, for safety reasons.

- Staff will notify volunteers when masks are required, based on State mandates and current COVID-19 count status.

Coconut Rhinoceros Beetle

Coconut Rhinoceros Beetle Information

SMART TREES PACIFIC

CRB RESPONSE

The Coconut Rhinoceros Beetle (CRB) is native to South East Asia and has spread through parts of the Pacific. It was detected on Oahu at the Honolulu Airport in Dec. 2013. Following this find, an emergency response program was created.

EGG

LARVA

PUPA

Look-alike Beetles:

Dung Beetle

Oriental Flower Beetle

CRB

2.5 inches

CRB are large black beetles with a horn. The can reach up to 2.5 inches in length as adults. The use their horns and strong arms to burrow into emerging fronds damaging the tree.

45 degree V-cuts

Borehole

CRB feed on palm hearts and emerging fronds, creating V-cuts or bore holes. As they feed they leave behind a distinct 45 degree cut with scalloped edges. On fan palms the leaf damage is similar to a paper snowflake. Extensive CRB damage results in the death of the palm. CRB are a pest to coconut, royal, date, and fan palms; as well as other tropical crops.

Snowflaked pattern of fan palm

COCONUT RHINOCEROS BEETLE RESPONSE

1849 Auiki St.
Honolulu, HI, 96819

Tel. 808-679-5344
REPORT A PEST:
808-643-PEST

info@CRBHawaii.org
www.CRBHawaii.org

Glossary

COMMON NAME: a name by which a tree may be known to people in a particular region or discipline. A particular species may be known by a multitude of common names, and a particular common name may be used to refer to more than one species. (see: Latin Name). For the purpose of this program, we use common names based on city records to better align for management needs.

CONDITION: a general assessment of overall tree health.

CROWN: The upper part of a tree, typically composed of large, scaffold limbs that support smaller branches, twigs, leaves, and buds.

CROWN SIZE: Tree crown size is measured as diameter (in feet) of the width of the branches at their greatest extent.

CULTIVAR: a cultivated variety of a particular species.

DENSITY: refers to the relative transparency of the crown; the greater the density, the less wind or light can penetrate the crown.

DIEBACK: One measure of tree health is crown dieback. Dieback is measured as the percent of branch tips in the crown that are dead.

DSH: Diameter Standard Height; also referred to as DBH; the diameter of the trunk of a tree at breast height (4.5 ft or 1.37 m from the ground). Unit of measurement in our project is in inches.

GROWING SPACE: also referred to as site type; description of the tree's immediate location or planting site

HEIGHT: Tree height is the vertical distance between a horizontal plane running through the top most point of a tree and a horizontal plane running through the mid-slope point of the base at ground level.

RANGE FINDER/ HYPSOMETER: a tool that can be used to calculate tree height.

LAND USE: the way the property around (or adjacent to) the tree is used by humans

LATIN NAME: also referred to as a scientific name; Latin names are based on the binomial system of nomenclature, developed by Carl Linnaeus in the 1700s. The binomial system of nomenclature is structured so that the Latin name of a plant consists of two names: (1) the genus or generic name, and (2) the specific epithet or species name. Latin names are universal, meaning, they remain the same worldwide providing certainty that scientists are referring to the same species.

LIVE CROWN RATIO: the ratio of the height of the crown to the height of the tree {(crown height / tree height) × 100].

PIT SIZE: The area allocated for tree planting.

STEM: For the purpose of data collection, the stem is the main trunk of the tree. Normally, stems are the tree's structural axes that supports leaves. Trunk, limb, bough, branch, and twig are all names used to describe tree stems.

STICK METHOD: a method for estimating tree height.

WRA SCORE (Weed Risk Assessment): The weed risk assessment is a screening tool to assess a plant before it is imported or widely planted in Hawaii. Botanists look up published and on-line information to answer 49 questions about a plant's biology, ecology and invasive tendencies elsewhere. The answers to these questions result in a score that predicts whether a plant is likely to be invasive in Hawaii or other tropical Pacific islands sharing a similar climate. Learn more here: https://sites.google.com/site/weedriskassessment/

References

Urban and Community Forestry Resources

- National Arbor Day Foundation: http://www.americanforests.org/
- American Forests website: http://www.americanforests.org/
- International Society of Arboriculture: http://www.isa-arbor.org/
- Trees Are Good – provides quality arboriculture/tree care related information: http://www.treesaregood.com/
- USDA Forest Service Urban and Community Forestry: http://www.fs.fed.us/ucf/