UC ANR Invasive Shothole Borer Monitoring Project iNaturalist Guide

Prepared by ISHB Survey and Trapping Coordinator

Updated September 2023

Background

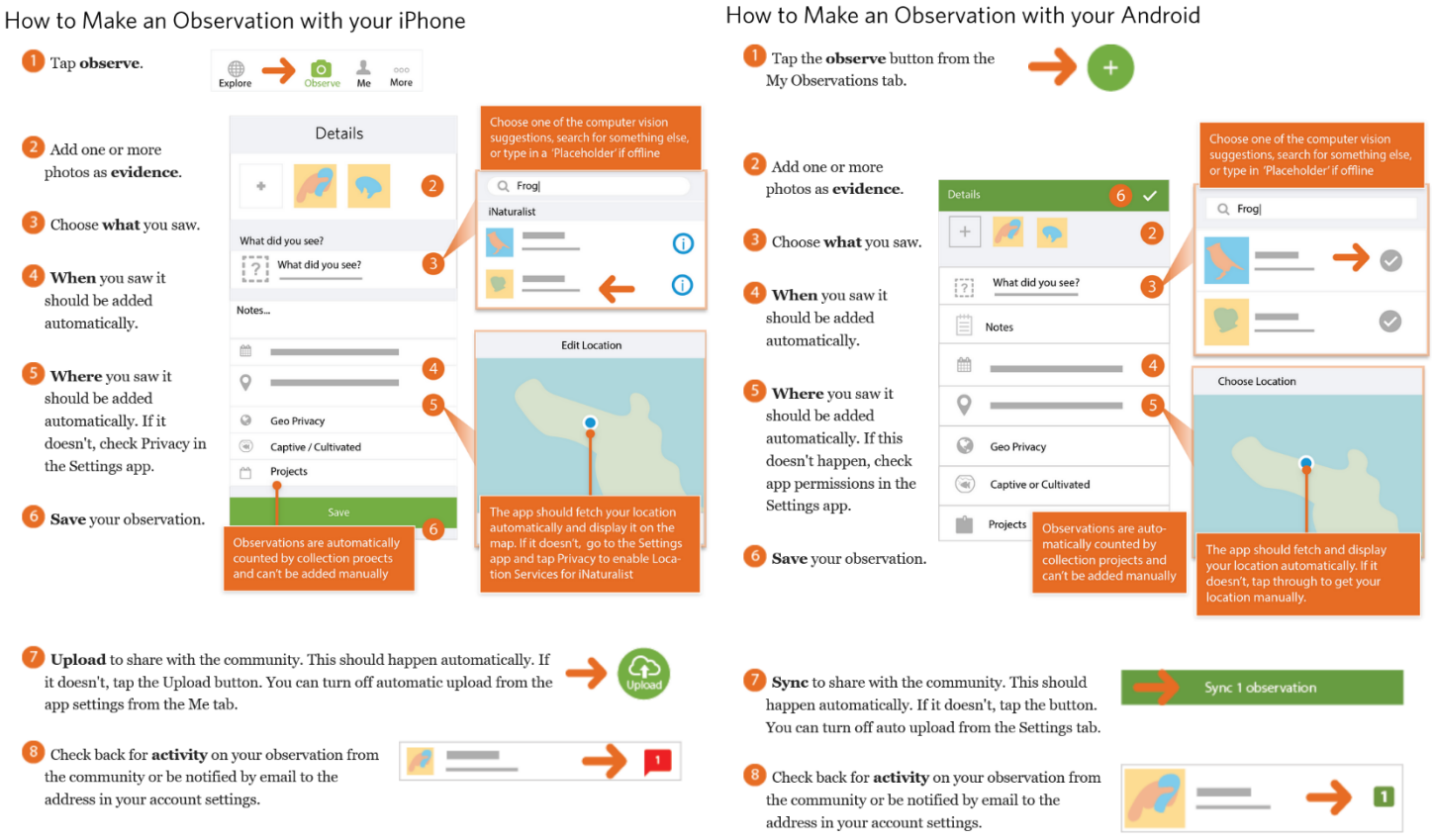
Invasive shothole borers (ISHB) are wood boring beetles that attack many native and non-native trees in Southern California. These beetles bore tunnels into trunks and branches where they grow a fungus they use as food. The fungus causes a disease called Fusarium Dieback. Trees infected with Fusarium Dieback show branch dieback, canopy loss, and may eventually die. Infested trees become sources of beetles that can spread to surrounding hosts. This pest can also spread long distances through infested green waste and firewood, affecting new areas.

In previous editions of participatory science programs, we learned that trained volunteers can identify ISHB-infested trees with 96% accuracy. This high accuracy of volunteer observations allows us to include the data collected through this program directly into the ISHB statewide distribution map. Knowing where beetles have spread will assist scientists, municipalities, and many other conservation agencies plan for management. Also, detecting infestations in their early stages allow for better chances of successful management.

Trained volunteers will be invited to the iNaturalist project. After online and in person trainings, volunteers will be tasked to make a specified number of observations within a specified time frame.

How to make an observation with an iPhone or Android device

The infographic below can be found on the "Getting Started" page in iNaturalist's help section.

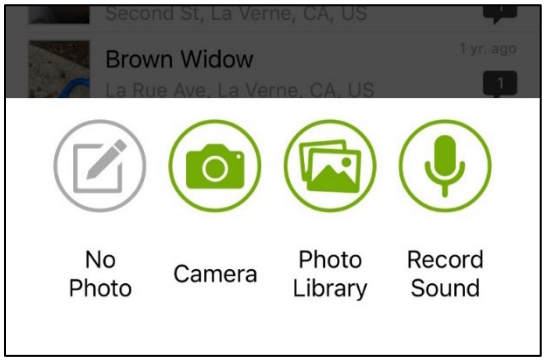


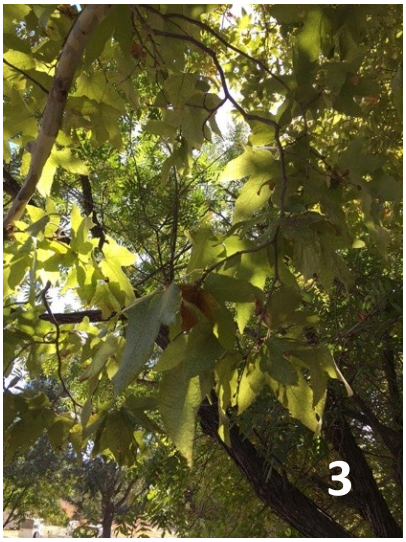
Part of the terms of the UC ANR ISHB Monitoring Project are adding specific photos:

1. Close-up photo of beetle holes with ballpoint pen included for scale
2. Close-up photo of the tree bark
3. Close-up photo of the leaf
4. Full photo of the tree (with an identifying landmark if possible)
5. If visible, evidence of gumming, staining, presence of frass, or sugar exudates

Additional photos may include: fruit, flowers, other identifying characteristics as necessary

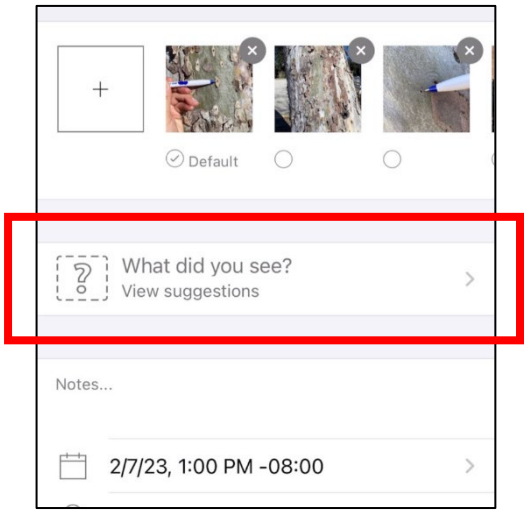
Start an observation by adding the photos, either directly from the camera in app or from a photo library.

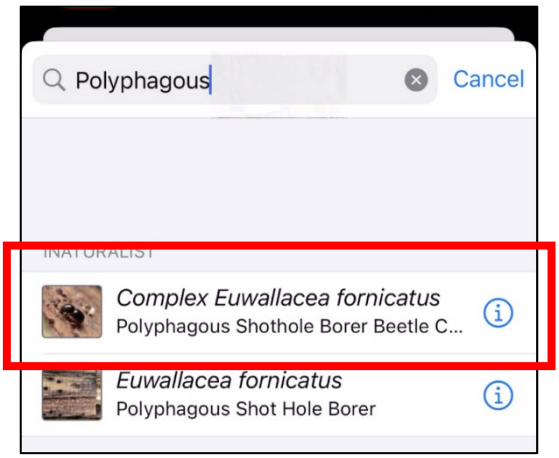




In the "What did you see?" field, make sure to select "Complex *Euwallacea fornicatus* Polypagous Shothole Borer Beetle Complex"

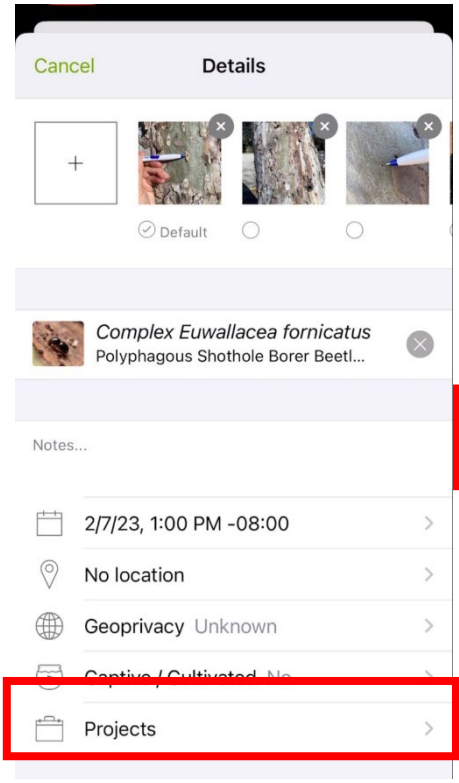
To add the observation to the project, the identification must be "Complex *Euwallacea fornicatus* Polypagous Shothole Borer Beetle Complex"

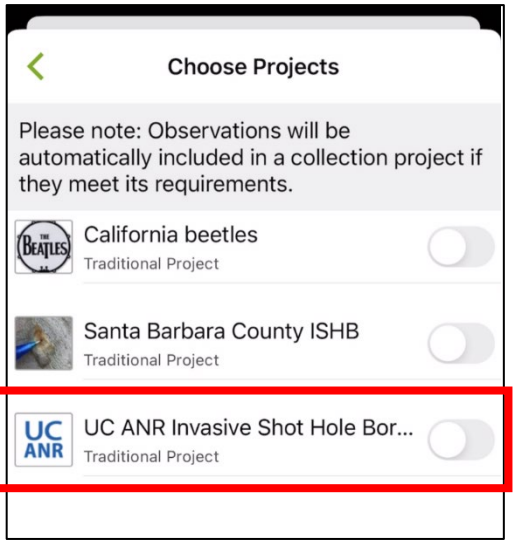


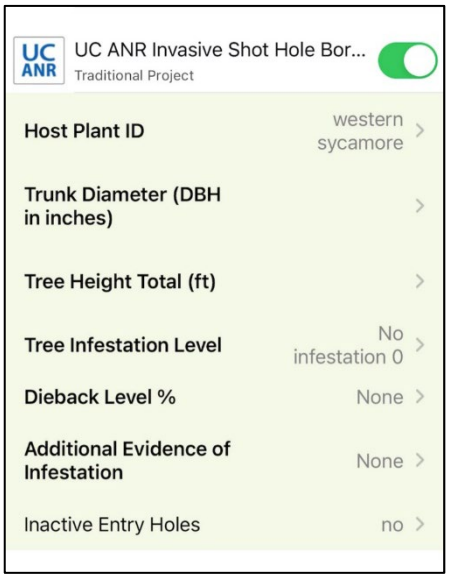


Adding an observation to a project

At the bottom of your observation, select “Projects.” Projects that you participate in will appear. Select “UC ANR Invasive Shot hole Borer Monitoring Project.” Once the project is selected, fields appear.







Completing UC ANR ISHB Monitoring Project fields

1. Host plant (best guess and add pictures of leaves, flowers, and/or fruits for ID)
2. Tree DBH (diameter at breast height)
3. Tree height (estimate)
4. Tree infestation level
5. Dieback level (%)
6. Additional evidence of infestation (staining, gumming, frass, or sugar)
7. Inactive entry holes (yes/no)

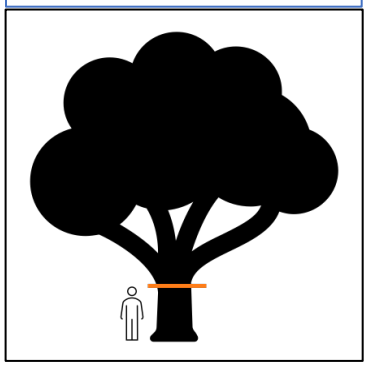
Host plant: refer to the reproductive host list to help find potential trees to evaluate. If unknown, you may enter genus or kingdom level identification. Additionally, a separate iNaturalist observation can be made to find identification using iNaturalist's ID best guess.

Tree DBH: record in inches. Diameter at breast height is measured at 4.5 ft from the ground. If on slope, take measurement at high side of slope.

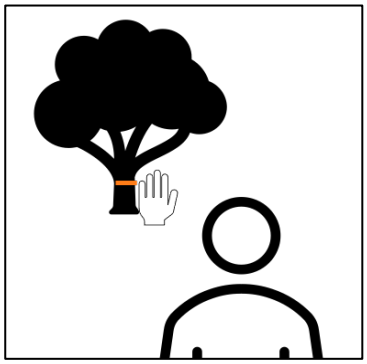
Tree height: record in feet. Make best estimate possible.

1. Find your height on the trunk

I'm 5' 11", so *1 Bea* ~ 6'

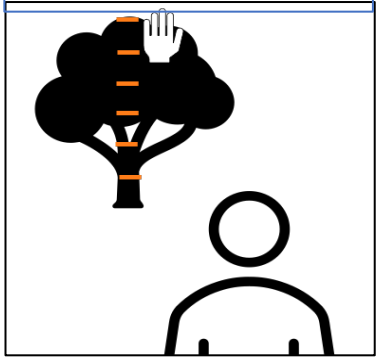


2. Get far from tree. Find a "unit" that matches your heigh mark (e.g. length of



3. Count how many times "unit" fits within the tree height

Bea fits approx. 6 times in the tree, so 6' x 6 = ***36'***



Tree infestation level: based on number of active ISHB entry/exit holes per stem. Observe tree and branches from all sides.

None (0)
Low (<50)
Moderate (50-150)
Heavy (>150)
Severe (>150 and dieback)

Dieback percentage: only report branch dieback associated with trees that have a severe ISHB infestation.

0%
1-10%
11-20%
21-30%
>30%
Dead

Additional evidence of infestation: staining, gumming, frass, or sugar.

Inactive entry holes: Yes or No depending on if there are entry holes that are being compartmentalized by the host tree

After filling out required information press “Share” or “Sync.” If any of the required fields are missing, then iNaturalist will not allow the observation to be saved. Once the observation is uploaded, a look at the project’s observations will verify if it has successfully been added to the project.

UC ANR ISHB Monitoring Data Sheet

Date: _____ Time: _____ Coordinates: _____

Host plant ID: _____

Tree DBH (diameter at breast height in inches): _____ Tree height (in feet): _____

Tree infestation level:

Low	1-50 entry holes	No dieback
Moderate	51-150 entry holes	No dieback
Heavy	>150 entry holes	No dieback
Severe	>150 entry holes	No dieback

Percent Dieback: 0% 1-10% 11-20% 21-30% >30% Dead

Additional evidence of infestation: Staining Gumming Frass Sugar

Inactive entry holes: Yes No

Photos taken (*required): ____ *CLOSE-UP OF ENTRY HOLE W/BALLPOINT PEN FOR SCALE
____ *CLOSE-UP OF TREE BARK ____ *CLOSE-UP OF LEAF
____ *FULL PHOTO OF TREE W/IDENTIFYING LANDMARK, IF POSSIBLE
____ STAINING, GUMMING, FRASS, SUGAR EXUDATE (if evidence of)
Additional photos may include: fruit, flowers, other identifying characteristics

Notes: