

# 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

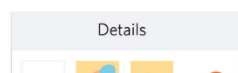
The infographic below can be found on the "[Getting Started](#)" page in iNaturalist's help section.

### How to Make an Observation with your iPhone

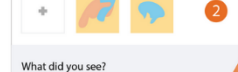
1 Tap **observe**.



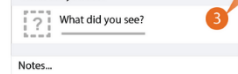
2 Add one or more photos as **evidence**.



3 Choose **what** you saw.



4 **When** you saw it should be added automatically.



5 **Where** you saw it should be added automatically. If it doesn't, check Privacy in the Settings app.

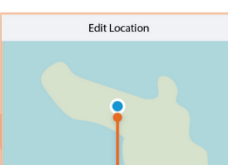
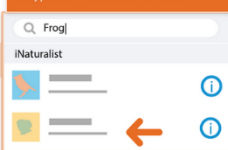


6 **Save** your observation.



Observations are automatically counted by collection projects and can't be added manually

Choose one of the computer vision suggestions, search for something else, or type in a 'Placeholder' if offline



The app should fetch your location automatically and display it on the map. If it doesn't, go to the Settings app and tap Privacy to enable Location Services for iNaturalist

7 **Upload** to share with the community. This should happen automatically. If it doesn't, tap the Upload button. You can turn off automatic upload from the app settings from the Me tab.



8 Check back for **activity** on your observation from the community or be notified by email to the address in your account settings.



### How to Make an Observation with your Android

1 Tap the **observe** button from the My Observations tab.



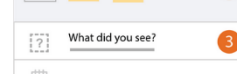
2 Add one or more photos as **evidence**.



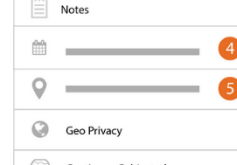
3 Choose **what** you saw.



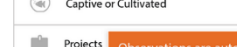
4 **When** you saw it should be added automatically.



5 **Where** you saw it should be added automatically. If this doesn't happen, check app permissions in the Settings app.

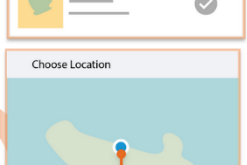
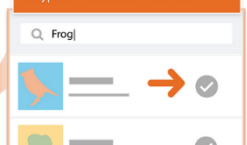


6 **Save** your observation.



Observations are automatically counted by collection projects and can't be added manually

Choose one of the computer vision suggestions, search for something else, or type in 'Placeholder' if offline



The app should fetch and display your location automatically. If it doesn't, tap through to get your location manually.

7 **Sync** to share with the community. This should happen automatically. If it doesn't, tap the button. You can turn off auto upload from the Settings tab.



8 Check back for **activity** on your observation from the community or be notified by email to the address in your account settings.

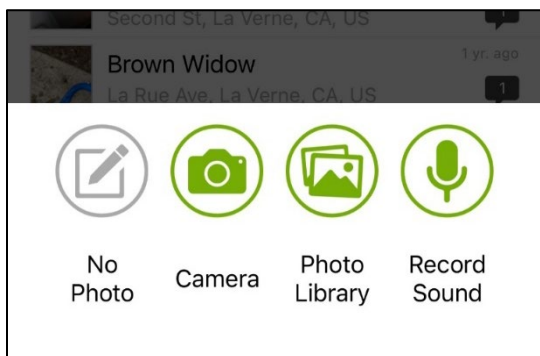


Part of the terms of the UC ANR ISHB Monitoring Project are adding specific photos:

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

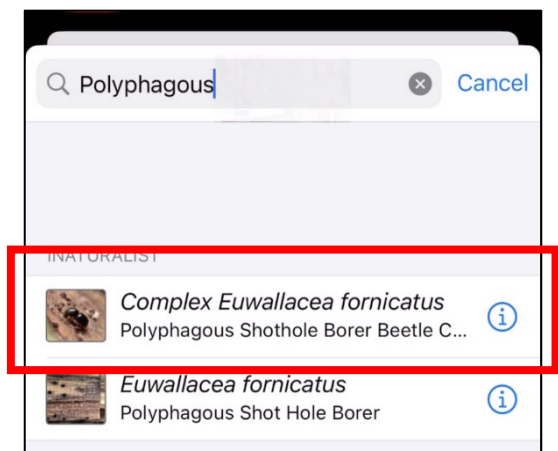
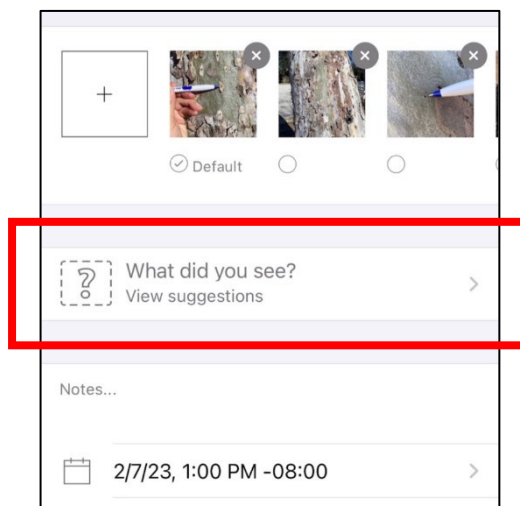
Additional photos may include: fruit, flowers, other identifying characteristics as necessary

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.


Cancel

Details

+









☒ Default


☐


☐


 **Complex Euwallacea fornicatus**  
Polyphagous Shothole Borer Beetl...


Notes...

 2/7/23, 1:00 PM -08:00

 No location

 Geoprivacy Unknown


 Captive / Cultivated No


 **Projects**


<


Choose Projects

Please note: Observations will be automatically included in a collection project if they meet its requirements.

 **California beetles**  
Traditional Project

 **Santa Barbara County ISHB**  
Traditional Project

 **UC ANR Invasive Shot Hole Bor...**  
Traditional Project

 **UC ANR Invasive Shot Hole Bor...**  
Traditional Project

☒

**Host Plant ID**

western sycamore >

**Trunk Diameter (DBH in inches)**

>

**Tree Height Total (ft)**

>

**Tree Infestation Level**

No infestation 0 >

**Dieback Level %**

None >

**Additional Evidence of Infestation**

None >

**Inactive Entry Holes**

no >

## 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)

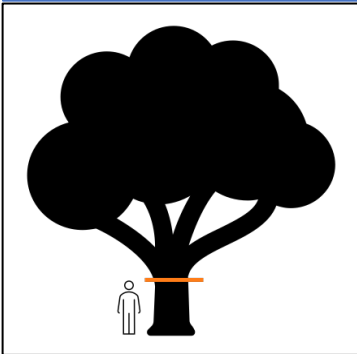
**Host plant:** refer to the [reproductive host list](#) to help find potential trees to evaluate. If unknown, you may enter genus or kingdom level identification. Additionally, a separate iNaturalist observation can be made to find identification using iNaturalist's ID best guess.

**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.

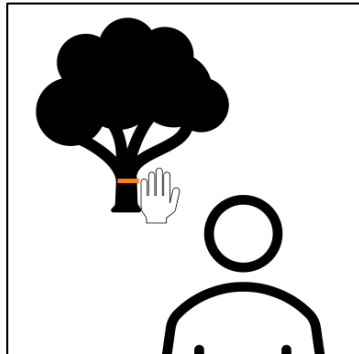
**Tree height:** record in feet. Make best estimate possible.

### 1. Find your height on the trunk

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

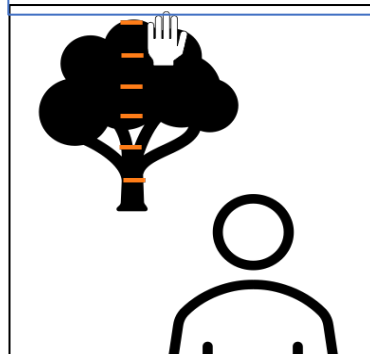


### 2. Get far from tree. Find a "unit" that matches your height mark (e.g. length of



### 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: