**ANNUAL TREE MORTALITY SURVEY\_ ForestGEO-SCBI\_2020**

**NOTE: Due to the coronavirus situation in Sumer 2020 we implemented few modifications to this census, mainly:**

* **No coring of dead trees (if time allows, it will be done once survey is completed)**
* **Include chvi species that excluding in 2019.**

At the SCBI large plot, a blue re-bar located in the SW corner gives the quadrat names. Locate the rebar and orientate yourself. Locate trees within quadrat. Coordinates (x, y) are given in reference to a 20x20m square.

**What to bring to the field**:

1. Datasheet, either printed or in electronic format (use IPad provided).
2. Camera (find it in drawer with other electronics)
3. Binoculars, **IMPORTANT** to check live status of very tall trees and to distinguish between leaves of lianas or tree under inspection.

***Tree data (pre-existing data)***

***NOTE:*** *This data should already be built in the datasheet that you bring to the field. See updated script to create datasheets (GitHub\SCBI-ForestGEO-Data\tree\_mortality\R\_script\Script\_to\_produce\_datasheet)*

**Codes 2013:** refers to stem conditions given in 2013 (last core census): **A**: alternate pom (point of measurement), **B**: stem broken above breast height, **C**: dead above 1.3m, **F**: Incorporated into fence, **G**: ID to Genus certain, **I**: stem irregular where measured, **J**: Bent, **L**: leaning stem, **M**: multiple stems, **main**; main stem, **P**: prostrate stem, **S**: secondary stem, **V**: Vine, **X**: stem broken below 1.3 m. Dead codes: **DS**: Dead, stem standing, **DC**: Dead, stem fallen, **DT**: Only tag found, **DN**: No plant nor tag found.

**DBH (mm):** Diameter at breast height in millimeters. Given for all trees as last core census.

**Live status in previous mortality census:** A (Alive), DS, DC, DN, and PD. PD: “previously dead”: tree found dead during a previous census. If the tree is found alive, change status and write in comments. If DN, try to relocate the tree again and indicate the FAD.

**New status**: use A, AU, DC, DS. There shouldn’t be a DN; you need to find all trees in the list. AU is used for trees that are alive but noticeably unhealthy (e.g. fallen and uprooted but not yet dead).

**PROCEDURE**

1. Locate stem on datasheet and classify it as “A”, “AU”, “DC”, or “DS”.

2. If the status is “AU”

1. Record FADs in order of importance (at least 1 factor).
2. Record crow.position (D, CD, I,S,OG).

3. If a stem is dead:

1. **Take pictures:** Take a picture of every dead tree found. Take tag picture first then make 2-3 pics of main FADS. Make close-ups if any insect or insect galleries are found.
2. **Measure DBH** (mm). If stem has fallen, measure it later using the big caliper.
3. Record **Percentage of crown** still intact:

1 = only 0-25% of the crown is intact (almost gone)

2 = 26-50% of the crown is intact

3 = 51-75% of the crown is intact

4 = 76-100% of the crown is intact (none or few branches lost)

1. Record **Crown Position:**

*Dominant* (**D**): Crown extends above the general level of the canopy receiving full sunlight.

*Codominant* (**CD**): Crown forms main level of canopy, tree receives full sunlight from above.

*Intermediate* (**I**): Shorter trees with smaller crowns, receive little light from above and none from sides.

*Suppressed* (**S**): Crown below canopy, small crown receives no direct light.

*Open grown* (**OG**): Crown on open areas of the stand.

1. Record Liana load.

0 = lianas absent

1 = up to 25% of the tree crown covered by lianas

2 = 26–50% liana cover

3 = 51–75% liana cover

4 = 76–100% liana cover.

1. Record **FAD** (Factors associated with death) in order of importance.

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| To scrutinize the FAD’s look at “*Guide to Identify Tree Diseases at the SCBI-CTFS Forest-GEO*  *Plot*”. **FAD Categories:**  **U= Unable to determine cause of death**  *Mechanical damage*  **B= Broken stem (note cause, indicate level on tree)**  CR= Crushed by other tree or tree parts  **UP**= Uprooted tree (root bole exposed)  **S= Slope failure (evident landslide even if small)**  **L= Lightning (tree splitting, straight scars from above)**  Fi= Fire (stem charred, fire scars on bark) | *Biological agents*  **AN= Animal damage (specify animal if possible)**  **BB=Bark beetles present, beetle galleries.**  **I= Insect infection (e.g. EAB, other)**  **DF**= Complete defoliation ((record crown condition using Smith/Flower method below 1 – 5 scale).  **F= Fungi visible (give names if known)**  **K**= Canker or swelling present (cause by fungi)  **LF**= Leaf damage (look for leaf spots, blotch, etc.)(new 2019)  **R= Rotting stem.**  **R1= Root damage**  **R2**= Armillaria root disease |

TO DO: ADD Fraxinus….

**CORING:**

If time allows, cores will be taken at the end of survey.

1. Take 1 **core**, aiming to hit the center: only at breast height and for the following species: ceca, amar, cofl, ploc, prav, rops, saal, and all Quercus.
2. Save in straws for future analyses. Label each straw with tag #, species, and date.
3. Mark in datasheet cored=yes/no.