

BASIC INSTRUCTIONS FOR TAKING A GPS READING WITH A GARMIN ETREX 10 UNIT

See **ADVANCED INSTRUCTIONS** below for a more in-depth walk through. Review these instructions prior to monitoring. Take readings for annual populations, new populations, and populations that have changed in size. Take new GPS readings of stable, perennial plant populations every 2-3 years.

Buttons:

- **POWER** allows you to turn the unit on or off.
- **BACK** allows you to move to the previous screen
- **ZOOM KEYS (UP & DOWN)** allow you to zoom in and out on the map
- **MENU** allows more custom ability to each unit
- **THUMB STICK** allows you to navigate between options and select an option or open a menu

To Turn the GPS Unit On/Off:

- Press the **POWER** button. (Please do not forget to turn the unit off whenever it is not in use as the batteries run down quickly.)
- To verify the unit has connected to the satellites, press the **POWER** button once. When the GPS bars in the lower right corner are solid, your device has acquired satellites.
- Getting a good signal:
 - **Moving around**, especially in a straight line, helps the satellites locate you faster
 - **If you are under a dense canopy**, it helps to track satellites in a nearby open area first, then bring unit (with the power still on) back to the plant population
- **Accuracy:** GPS unit will show accuracy at the top of the screen under the **SATELLITE** option
- **Try to get about 3-8m accuracy** in open areas (if the error is a very large number at first, keep the unit on and wait a few minutes for the error to reduce as you walk around)

To Take a Reading (see Figure 1 for where to take readings in the population):

- From the main screen, use the **THUMB STICK** to highlight the option **SATELLITE**
- Hold GPS unit at a place you want to take a reading, select option with **THUMB STICK**
- Record the reading on the Monitoring Form - °N is the top line (7 digit number) and °W is the bottom line (7 digit number). The northerly reading corresponds to latitude and the westerly reading corresponds to longitude. POC GPS units are set up to read in the coordinate system Decimal Degrees with datum WGS84 (if you don't know the current settings on your unit view the "Check/Adjust Settings" section below in the Advanced Instructions).



Figure 3: The buttons as they appear on the GPS Etrex unit.

ADVANCED INSTRUCTIONS FOR USING A GARMIN ETREX 10

Things to Know about the Garmin eTrex 10 Unit:

- Screens: The eTrex 10 has one main screen with many different options available. Use the **MENU** button to change the order of the options. POC GPS units are set up with the following options to appear first when the units are turned on.
 - **Map**
 - Shows your current position on a map.
 - Tracks your movements with a trail
 - Can view the location of waypoints and shows the direction you need to travel to reach a point.
 - Options:
 - **ZOOM KEYS** (UP & DOWN) will allow you to zoom in and out.
 - **Mark Waypoint**
 - Mark a waypoint
 - See current fixed location for recording purposes
 - Enter a GPS coordinate to find
 - **Waypoint Manager**
 - View, delete or navigate to a waypoint
 - Think of waypoints as you would a visual marker on a landscape; you can navigate to them or use them as a position reference
 - **Satellite**
 - See current fixed location and GPS accuracy for recording purposes
 - See number of satellites currently connected to
 - **Setup**
 - Change the **Time** format
 - Change the **Display** contrast to make the screen easier to view
 - Change the GPS Units of measurements (see below in “Types of data”)
 - **Position format** (aka coordinate system)
 - **Map datum**
 - **Units**
- Types of data: POC has preferred ways for you to collect this data (see below), but if you have collected GPS using one of the other coordinate systems or datums, indicate this on your monitoring form and we will convert.
 - **Coordinate systems** are different formats used for recording a location (aka POSITION FRMT)
 - **Decimal degrees (e.g. hddd.ddddd)** (POC’s preferred coordinate system)
 - Degree Minute Second (e.g. hddd°mm'ss.s")
 - UTM (e.g. ddddd)
 - Minute Decimal (e.g. hddd°mm.mmm)
 - **Datum** is the way the data are projected onto the earth (aka MAP DATUM)
 - **WGS-84** (POC’s preferred datum)
 - NAD-27 (Conus)
 - NAD-83



- Batteries
 - GPS units use a great deal of power and can drain batteries very quickly
 - Turn off the unit when you no longer need it
 - POC units may come with rechargeable batteries, so don't throw batteries away
 - POC provides an extra set of batteries with each unit. Just in case!

To Check/Adjust Settings before Taking a Reading (crucial before recording coordinates):

- From the main screen use the **THUMB STICK** to highlight and select the **SETUP** option
- Using the **THUMB STICK** navigate down to **POSITION FORMAT** and select this option
- There are two settings: **POSITION FORMAT** and **MAP DATUM**
- Select **POSITION FORMAT**, and using the **THUMB STICK** highlight and select **hddd.ddd°**
 - This is Decimal Degrees and the requested format for POC
- Select **MAP DATUM** and using the **THUMB STICK** highlight and select **WGS 84** (requested format for POC)

Use GPS to Locate a Population from Previously Collected GPS Points or Create a Waypoint:

In order to relocate your population using GPS, you will need to enter the coordinates from a previous monitoring form into the GPS unit which you will bring into the field.

POC transforms all GPS data into WGS-84, decimal degrees, which should minimize the need to re-set your unit. However, you may wish to locate populations using readings in a different datum, in which case you must ensure that your GPS unit is set up for the correct datum of the coordinates you enter. Follow directions below.

To enter coordinates written on the monitoring form into the GPS unit:

- Check the unit's setup menu to see what coordinate system and datum the GPS unit is currently set to.
- Adjust the coordinate system (aka POSITION FRMT) and datum (aka MAP DATUM) so they match the coordinate system and datum of readings you are using. See "Check/Adjust Settings" and "Types of Data" above.
- From the MENU SCREEN highlight **MARK WAYPOINT** and press the **THUMB STICK** to select
- Scroll up until the reading in the middle is highlighted, press the **THUMB STICK** to select
- Using the **THUMB STICK** use the left and right arrows at the bottom of this screen to highlight subsequent digits in the coordinate number
- At the location number you wish to change, use the **THUMB STICK** to highlight and select the number you want to replace it with in the number pad
- Scroll to the next number you want to change, repeat. Go through all the numbers until the reading is correct.
- Once finished, scroll down to highlight **DONE** and press the **THUMB STICK** to select. When back at the Mark Waypoint screen, scroll down to select **DONE** again. This will save your waypoint. Write down the title of the waypoint you created (the number next to the flag), so you can navigate to that point.



*When entering UTM/UPS coordinates, the first two digits are "1" and "6". **Do not change this** as this represents "16", the standard UTM zone for Illinois. The actual coordinates starts after the "T".*

Tracking Back to an Existing Waypoint (i.e. a waypoint you created):

- Press **BACK** button to bring up **MAIN MENU** page
- Highlight **WAYPOINT MANAGER** and press **THUMB STICK** (you are now in Waypoint Page)
- Using **THUMB STICK** select the desired waypoint
- **GO** should be highlighted already, use **THUMB STICK** to select
- The Map Page appears and you are now ready to be guided to your waypoint. On POC units, there will be four boxes at the top of the Map Page
 - **DISTANCT TO DEST** – Displays the number of meters to arrive at your destination
 - **GPS ACCURACY** – Gives you the current accuracy of the GPS Unit
 - **HEADING** – Tells you the direction you are currently moving
 - **BEARING** – Indicates the direction you need to walk to reach your destination



The GPS Compass does not function in the same way as a conventional compass. It is not sensitive enough to detect which direction you are facing initially though it will provide a helpful direction once you are moving across the landscape. For this reason, **use an actual compass to tell you which direction to go before you begin.**

Example: Looking at the compass screen on the GPS unit, I see that the arrow is pointing straight to “N” with a distance of 6.66 m, indicating that I need to walk 6.66 m North to find my plant. However, when I look at my own compass, I realize that I am facing South. Therefore, first I adjust my direction by referring to my actual compass and turn to face North. Then I begin moving North while watching my GPS compass screen. I begin to see that my ‘distance to population’ is decreasing, so I know I’m moving in the correct direction.