San Pedro River Wet/Dry Mapping
Monitoring Instruction Sheet
Updated May, 2017

Please read BEFORE you start out, even if you have attended a training session!!!

PROJECT OBJECTIVE: The main objective of this monitoring project is to create a map that shows where water is present in the San Pedro River Basin during the driest time of year, and where it is not. On **the third Saturday of June**, local community members and volunteers will travel along the river on foot and on horseback using GPS units to mark the locations where water is present. GPS, or Global Positioning Systems, is a worldwide radio-navigation system that uses signals from satellites, and records your position. We will use the UTM (Universal Transverse Mercator) coordinate system which divides the surface of the earth into 60 zones, and is recorded in feet.

TEAM PREPARATION: Teams will assemble at predetermined starting locations. Before starting out on the river, make sure that every member of the team has:

- Adequate supply of drinking water—2 quarts at a minimum
- At least one member of the group has a cell phone or radio (keep it turned on at all times)
- Bring lunch/snack & and wear shoes you don't mind getting muddy

DATA COLLECTION:
Your mission is to record the GPS reading, accuracy estimate, waypoint number, time, and whether the water in the river starts or stops. Include both ponded water (stagnant pools) and flowing/ running water. Do not include wet sand or dirt, only the water surface itself. Note that you are recording data in two forms – hand-written on data sheets and electronic data recorded in the GPS unit. Record ONLY the Wet/Dry observations in the GPS unit. Record BOTH the Wet/Dry observations and other observations on the hand-written data sheets.

Be careful to check out all of the river's channels. Sometimes the flow of the river will be divided (with islands in the middle). Your group may spread out as you move along the river to make sure that you don't miss "another" parallel channel.

MONITORING INSTRUCTION STEPS:

1. Place or tie the wire flags or flagging tape provided in visible places at your starting point take the GPS reading (way point, time, accuracy number,12R or S & UTM points). Mark the reading in the unit *(see instructions below)* and record it on the 1st page of your data form-**this cover sheet is essential when processing the data in the office later**. This will be used as the end point for the up-river team, if there is one. If your starting point is at a bridge, get about 20 feet away from the bridge to ensure access to satellite signals. *(note: If you are starting at the Mexico border within the US, do not place a flag, just mark and record your GPS readings)*

2. After that, data points (accuracy number, way point, 12R or S & UTM) will be marked in the unit and recorded on the rest of your data sheets, according to the instructions below--"What to Record".
3. Your final GPS reading should be taken at the wire start-flag placed by the adjacent (typically down-stream) team. Record this reading on the 1st *page* of your data form/cover sheet. NOTE: If your stretch of river is wet the whole way or dry the whole way, these readings on the first page/cover sheet will be your only recorded readings.

ADDITIONAL READINGS AND/OR DATA:

If requested for the particular year, please take notes of any **significant, fresh beaver sign** (dams, lodges, etc.) and **large trash piles ONLY if on BLM lands or TNC properties only.** As the ONE EXCEPTION TO THE 30-FOOT RULE, tributaries on PUBLIC LAND OR TNC PROPERTY you may take notes and write the GPS readings for pools that are less than 30-feet long. These pools are important refuges for certain species during this time of year, and provide important information to public or TNC land managers.

To take these readings, go to the "Other observations" form and write down the GPS reading (time, accuracy, 12R, UTM) note the type of observation. **DO NOT, DO NOT, DO NOT press the "Enter/Mark button on the unit!!!**

On private lands, you DO NOT have permission to collect ANY data other than start/stop locations of water. Please respect private landowner's privacy.

Record any neat experiences and your group's feedback on the Citizen Scientists Share their Stories form.

Take copious photos or capture videos of your time on the river and considering sharing these with project leaders for publicizing the mapping.

GPS UNIT BASICS:

Garmin GPSMAP 62S (includes 62st & 64) Instructions

These instructions are for the Garmin 62S units, which have a slightly different button configuration and screen interface than the 76S units (older units detailed below).

To turn the unit on and off, press and hold the power button on the right side of the device until the screen turns on.

The GPS acquires positional data from satellite transmissions. If your unit does not appear to be working, check for overhead interference and move slightly.

Below is a diagram of the GPS unit and the buttons.

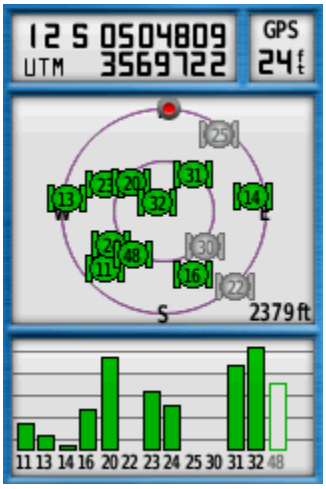
GPSMAP 62 Series Owner's Manual

The first screen to appear will be the satellite screen (see below). To toggle between different screens, press the page button. You will be using the home page to record locations.

For 62s units-

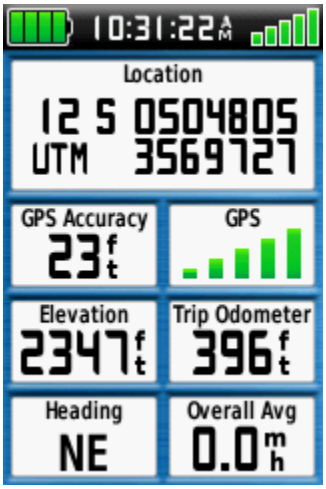
From the satellite screen, press the “PAGE” button once to arrive at the home screen.

Satellite Screen



GPSMAP 62 Series Owner’s Manual

Home screen



For 62st or 64 units:

From the initial screen, press the “PAGE” button several times until “TRIP COMPUTER” appears on the screen. Press “ENTER” to arrive at the home screen. Do the same if the screen changes away. The home screen on these units contains the same essential information for your data sheets at the 62s shown above- Location, GPS accuracy, Time, as well as GPS signal strength, Battery life, and Trip odometer.

ALL 62s, 62st, 64 - Same instructions from here-on:

If the screen changes away from the home screen, press the “PAGE” button until you return to this screen. The top of the screen contains a bar displaying the amount of battery power left, the time, and the strength of satellite signal. The accuracy is given in feet on the left side of the screen, under “GPS Accuracy”. Record this accuracy on your data sheet, and record the time. Next, record the UTM reading from the “Location” bar near the top of the screen. This recording has two numbers; one that starts with 12R or 12S and a second that starts with UTM. The numbers will look something like: 12R 0581500 and UTM 3890673. We will be recording our position in UTM meters, and using the NAD 83 datum.

Recording Waypoints (data points):

You will be recording your waypoints in two ways: on your data sheets and in the GPS unit. First, you will record the accuracy. If the GPS accuracy is greater than 25 feet, wait or move slightly. Next record the time as shown on your GPS unit. Make sure to use the clock on the GPS home screen, not your watch or cell phone; the time recorded with each waypoint in the GPS unit should match up with the times on the data sheet. To make a waypoint at your location, press the “Mark” button on the GPS unit. The waypoint detail screen will come up automatically. Write down the “12R” or “12S” and “UTM” numbers on your data sheet, as well as the waypoint number at the top of the waypoint detail screen, next to the flag icon. Using the arrow key, scroll down until the “Done” box on the bottom right of the screen is highlighted. Press the “Enter”

button to enter this data point in the GPS memory. The screen will then automatically return to the home screen.

The 30 foot Rule:
Wet segments or dry segments must be at least 30 feet long to have a waypoint entered. If they are shorter, we ignore them. UNLESS YOU ARE MAPPING A TRIBUTARY ON PUBLIC OR TNC LAND, see the only exception to the 30-foot rule in "Additional readings/data" on page 2 above. You can determine this distance in the field by pacing it off. Record both the starting and stopping points for water bodies that are more than 30 feet in length. If there is a break in the water (dry stretch) that is 30 feet or less, ignore it. For example, if the river flowed 60 feet then stopped for 10 feet, and then flowed for 100 feet, we would ignore that 10 foot break. We do not map both the start and stop points for any wet or dry segments that are less than 30 feet long because the accuracy of GPS measurements in this area is less than 30 feet.

Special Cases:
Note that we are measuring along the length of the channel, not width across the channel. For example, if a pool is 30 feet wide, and 15 feet long it would not be mapped (see "30 Foot Rule" sheet).

Be sure to check out all the river's channels. Sometimes the flow of the river will be braided (divided, with islands in the middle). Your group may spread out as you move along the river to make sure you don't miss a parallel channel.

Other Observations:
When recording wildlife sign, large trash dumps, or other unusual sightings **DO NOT press the "Mark"** button or record the information on regular data sheets. Use the separate "Other Observations" form to record the GPS data, **circle** the appropriate type of observation, and make any additional remarks. Even though we are not marking this point on the GPS unit, be sure to write down the coordinates from the "Location" box on the home screen. It is important that this information be kept separate from the water data and not entered in the GPS units.

Tips:
To obtain the most accurate reading, hold the GPS unit away from you with the "antenna" tilted up and away, and try to minimize shaking. **Not waiting for an accurate GPS reading is the easiest mistake to make.** If the GPS accuracy reading is greater than 25 feet, wait or move slightly until greater accuracy is reached. Ideally, the ascending bars in the "GPS" box on the home screen will be completely highlighted. If your starting and/or ending points are at a bridge, move about 20 feet away from the bridge to ensure that your GPS unit has access to satellite signals.

The GPS units are water resistant but not entirely waterproof. If it begins to rain, try to protect them as much as possible from water. You will be given a plastic zip lock bag to put the units in if it starts raining. Measurements can be made while the unit remains in the sealed bag.

For Battery Check/Replacement:
The batteries in your GPS unit should last a total of ten hours. To check on how much battery power you have left in your GPS, press the "PAGE" button until the home page appears. The battery symbol on the top left corner of the screen displays how much batter power remains (shown in green). Check your battery power before you head out and replace the batteries if the battery icon shows that battery power is low. To change the batteries, power off the unit by pressing and holding the on/off button on the side of the unit, and turn the D-ring on the back to unlock the battery cover. Remove the back and replace the old batteries with new ones. After replacing and locking the battery cover, turn the unit back on and check to make sure that your readings are still in 12R or 12S and UTM units. If not, note this on the data sheets in LARGE print.

Garmin GPS 76 Instructions

These directions are for the Garmin GPS76s units, but other units have very similar screen interfaces and buttons and are equally user friendly.

1. The GPS acquires positional data from satellite transmissions. If your unit does not appear to be working, check for overhead interference and move slightly.

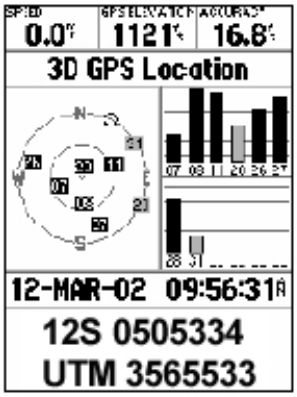
2. To turn the GPS unit on or off, press the "red light bulb" button or the power button on the side

3. The "Page" button is used to toggle between various screens. You will be using the "Satellite Information Page" almost exclusively. If the screen changes after the satellites are acquired, press "Page" until you return to this screen. Each bar on this screen represents a satellite signal; the length of the bar indicates the strength of the signal. The "Accuracy" in feet is given at the top right of the screen. First, ***record the accuracy number on your data sheet. Look for the time*** *noted just to the left of the Accuracy number. Second,*

record the time on your sheet. Next, you will record the actual UTM reading given at the bottom of the screen, and will list two numbers: one that starts with "12R" or "12S" and a second that starts with "UTM". These numbers will look something like: 12R 0581500 and UTM 3890673. The time and date is shown just above the 12S and UTM readings. We will be recording our position in UTM meters, and using the NAD83 datum.

Recording Waypoints (data points)

You will be recording your waypoints in two ways: on your data sheets and in the GPS unit. First, you will note the accuracy estimate and time. If the accuracy is greater than 25 ft, wait or move slightly. Then, to record a waypoint, press and hold the "Enter" button on the GPS unit until the "Mark Waypoint" screen comes up automatically. Or, if your unit has a "Mark" button, press that one. Write down the "12R" or "12S" and "UTM" numbers on your data sheet, as well as the waypoint number still looking at the "Mark Waypoint" screen, check that the "OK" at the bottom right of the screen is highlighted. If it is not highlighted, use the center round black button to move the cursor until "OK" is highlighted. Press and release the "Enter" button again to enter the data point in the GPS memory. The screen will then automatically return to the satellite screen (same as "Satellite Information Page" we previously mentioned).



GPS Information Page

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