Hobo BIRD sensor workflow
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Steps completed by Technician(s) employed by LTER co-PI (Betts).

1. Synch the shuttle's clock to your computer, which presumably has the correct date and time. Check the batteries in the shuttle. May use more than one shuttle managed by several people.
2. Download data from sensors to the shuttle in the field, each May and July/August, during the BIRD point counting. Data must be downloaded first, before changing the battery. Use SF's protocol "Logger Offload with Shuttle."
3. Change batteries from units once a year, in July or August, also this serves as a check that Hobos are functioning. Batteries must be changed at least once a year, and the silica packet must be changed. Batteries must be ordered in advance along with new silica packets. Batteries must be changed correctly; changing the battery resets the power. Must re-attach the shuttle, after changing the battery, but this will result in a second data download that contains the same data but with future dates. The first data file contains the number of the sensor, the second file contains the number of the sensor with a zero at the end of the file. You must make sure to separate and delete these spurious files. Then examine the Hobo to ensure that the light is blinking every 8 seconds; this means sensor is launched, ready to collect data. As the shuttle waits for the next 20-minute interval to being collecting data; when that interval begins the hobo will blink every 4 seconds. Frequency of download events depends on BIRD point counts.
4. Troubleshoot any issues in the field including reprogramming and relaunching the Hobo.
5. Conduct calibration as needed. If calibrated, Hobo units need to be replaced in the same locations. Calibration is an involved process and has not been done since 2011.
6. A couple of tablets exist, which permit troubleshooting and connecting the hobo to the base station and launch them in the field.
7. At headquarters offload data from the shuttle, use protocol "Shuttle data download."
8. Examine each raw file, enter report in the Hobo log file containing the start and end date and other information about the placement of the sensor. These will be in Hobo format. Save one copy as csv. *Make sure the correct time zone (GMT-7) is selected before exporting.
9. Plot each file to ensure data are reasonable and to identify missing data and/or malfunctioning units.
10. Export an additional copy of each file as a .csv using the Hobo sensor name appended with a chronological number date of collection. They will be added to the complete set of the Hobo files and will be numbered accordingly. These .csv files are used as input into the python QAQC program.

11. There is a binder of protocols for the BIRD crew; this binder contains the protocols for downloading, troubleshooting, and calibrating the Hobo sensors.
12. All of the original BIRD data along with the HOBO download logs on are on Box.