Automated recording tips for longer recording periods.

I am recording almost all nights the year round in my garden but that gives some challenges.

-One will gather a huge amount of data, it is therefore important to limit the number of recordings that contain garbage.

-The detector will only last a few days so you need a charger or alternative power source even on deep sleep automatic recording.

-The detector was built for active use, and cannot survive wet climate so we need weatherproofing.

Data gathering.

The standard SDHC Micro-SD Class10 card has a size of maximum only 32GB, on a good summer day I noticed the memory card could fill-up quickly and going through the data is not much fun anymore. Sure the acoustic pipeline could help out determining the species but you need to exchange cards quite often. Larger than 32GB (SDXC) cards are not supported by default, they need to be formatted to FAT-32.

It is recommended to exit the auto record mode (hold left pushbutton until the detector wakes up) turn off the detector, take out the Micro-SD card, put in an empty card, turn on the detector, go to settings, set the wakeup- and sleep time and set deep sleep to on. Exit the settings start auto record. (display will be off, press right pushbutton to get the status, or left pushbutton to exit auto record, buttons are scanned every 30 seconds in sleep modes)
By turning off the detector and turning on in "normal" mode we can be sure the SD-Card is initialized properly. Since we probably also want to check and set the recording times it is wise to exit auto record before turning off. Once exited from auto record, deep sleep needs to be set to on as it is off by default.

To limit the number of bad recordings it is wise to set the start and end times close to sunset and sunrise. Since there is no automatic adjustment to sunrise and sunset, you do need to set these times to match the period you expect to record.

On auto record the trigger level slightly higher than at live use for the TFT display/Granular Stretch. However I also set gain for a lower value (20 or lower), this will prevent a lot of recordings that are hard to determine anyway because the are in the noise.

It is also important to make good use of the highpass filtering function. I usually set it to about 8 KHz and stages on 3 with Q at 0.4 since this dampens the very sensitive spot around 20Khz. If you simply want to record higher frequencies and do not need the serotines and noctules, Simply set to 30kHz or so, stages can probably be kept on 1 and Q also on 1 .

Power source.

The largest battery I managed to fit in the enclosures was 8Ah (126090) but that has a very tight fit. Last orders of batteries are 7Ah (106090) since these leave a little more space between PCB and battery. The 8Ah was used to record up to 5 summer nights, in winter the nights are much longer and it will not last that many nights. Every 3 to 4 nights you need to tun on a charger, this can be done with a switch timer. To prevent noise in the recordings, you can set the charging to the daytime.

An other option could be to use a power bank on the micro SD port. A power bank usually has li-ion battery and a circuit that creates 5V from the lithium battery. That circuit can be noisy so test would be nice. Also the 5V circuit get triggered by the connected user. The Teensybat in deep sleep draws just a little current. To keep the power bank "on", the TeensyBat wakes up every 30 seconds for a very short time. There is no guarantee every power bank will stay awake. Since the TeensyBat works on 3.7V one could also try to connect a lithium-ion battery directly to the micro-USB power input (make an alternative output on your power bank). I have not tested this. Other options are higher voltage batteries like 6, 7.4 or 12V with a step-down circuit that feed 5V into the micro USB port, or maybe some kind of solar charger although in winter there is not much sunlight an snow could block the solar panel. Please be aware, that most problems with batteries appear during charging. Although I never heard of fires using TeensyBat, or any other battery powered device in my circle of acquaintances , there are enough stories on the internet about power banks or phones.

It is best not to use power consuming options like GPS. Just gather GPS data (In Settings menu, GPS page should get GPS infix in 50 seconds), start auto record and turn GPS off. This way you will still have GPS information in the recordings but the GPS module will not drain the battery.
I have a special software that uses previously stored GPS settings in deep sleep auto record.

Weatherproofing.

The TeensyBat detector is intended to be used on days with nice weather when the bats are active. The automated recording is an added bonus. The construction is not very watertight, to help you create some weatherproof construction, an external microphone socket can be placed.

Placing a jack plug in the socket will turn off the internal microphone (be sure to remove the solder jumpers when placing the jack socket) the detector can be kept indoors and a microphone can be used on a properly shielded microphone cable and placed outdoors. I tested with a thin cable that was about 10m long and that still worked fine. Proper shielding is important and a low capacity per meter could be a good indication for low signal loss. The microphone can be the same as the internal microphone. It is recommended to keep the cable short or uses thicker cable on larger distances.

Now that the detector can be used indoors or in a waterproof enclosures, one only needs to weatherproof the microphone. Weatherproofing can be done by using a simple piece of kitchen cling film. This film is thin enough to move even on ultrasonic soundwaves. There will be a little attenuation but any acoustic membrane will wave a little effect on the sound quality. The cling film seemed to work best when it was not drum-tight but slightly loose over the microphone.