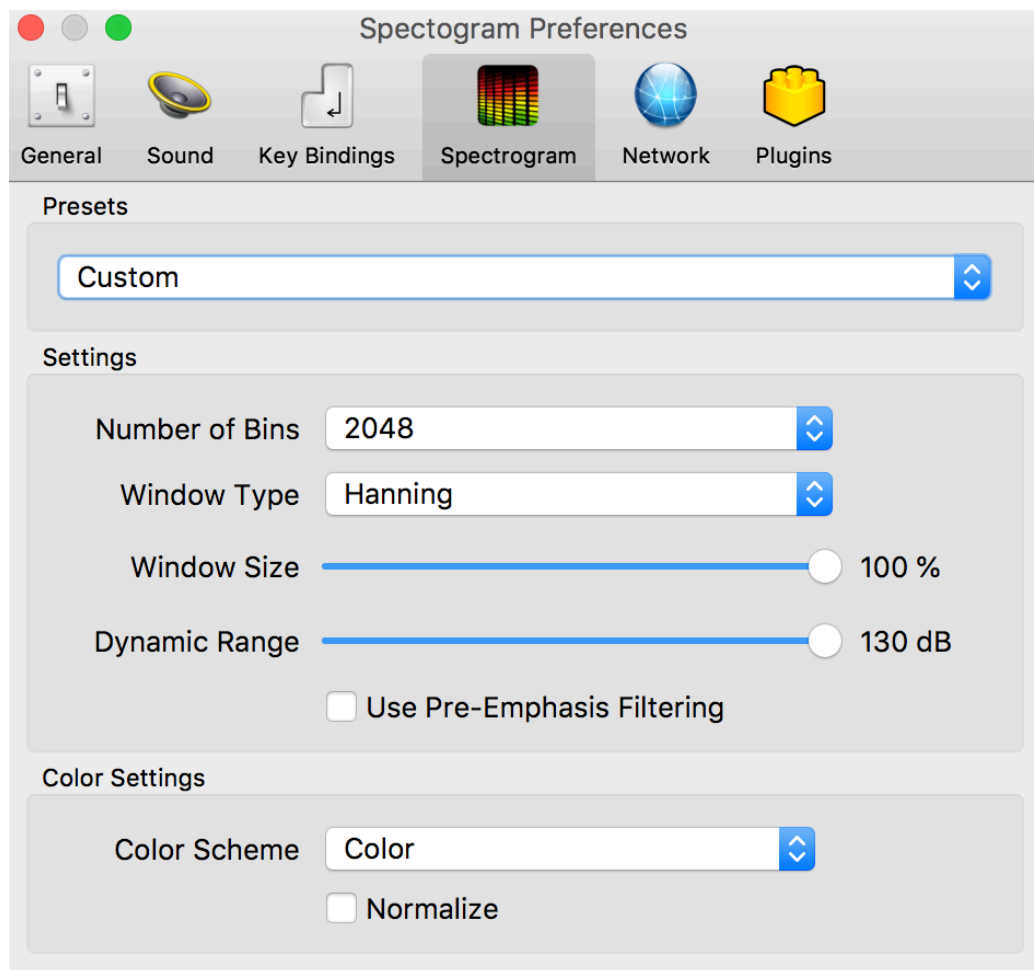


Using ocenaudio to edit your bird sound recordings

ocenaudio is a free sound-editing program that allows birders to quickly and easily review and edit their sound recordings for upload to eBird and the Macaulay Library.

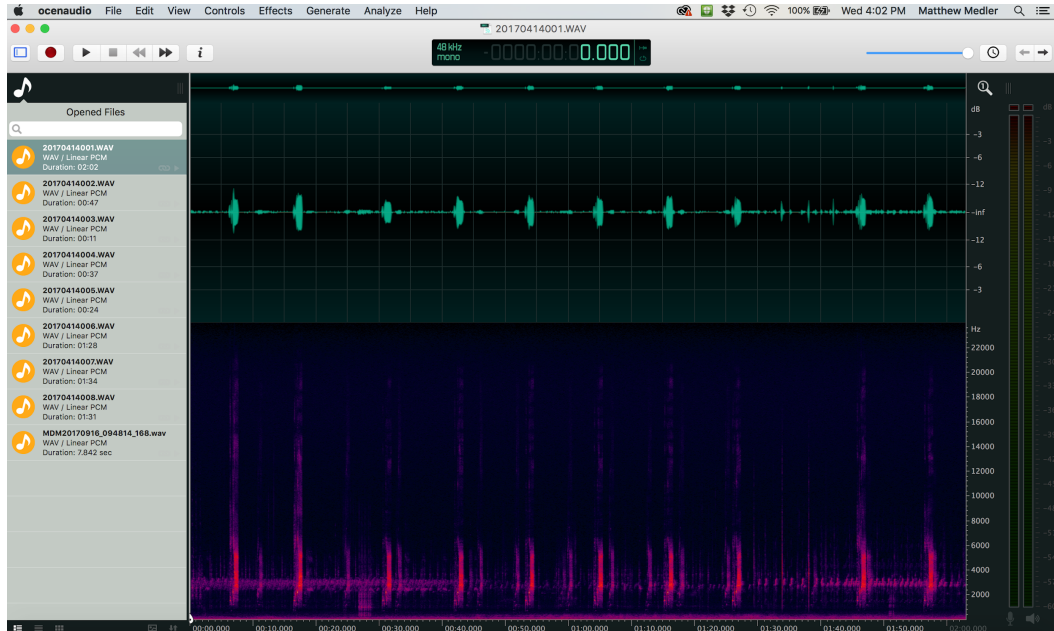
Spectrogram Preferences

The very first time that you open ocenaudio, you will want to change the spectrogram preferences so that you have high-quality spectrograms when you view your recordings. To do this, go to the ocenaudio preferences (ocenaudio...Preferences... on a Mac, Edit...Preferences on a PC) and then the Spectrogram tab. Then change the spectrogram preferences to the following settings, which will then be applied to all future sessions:



Getting started

Let's open some sound recordings! You can do this by dragging and dropping files anywhere in ocenaudio. Once you have a sound file open, the next thing you'll want to do is adjust the main view of the program so that it shows both a waveform and spectrogram. To do this, go to View...Waveform & Spectral View. Next, go back to the View menu, and under the Vertical Scale Format option, select Decibels. Finally, another good thing to do is add a large meter to your workspace by going to View...Level Meter→Full-size Level Meter. Once you've done these three things, your workspace should look something like this:

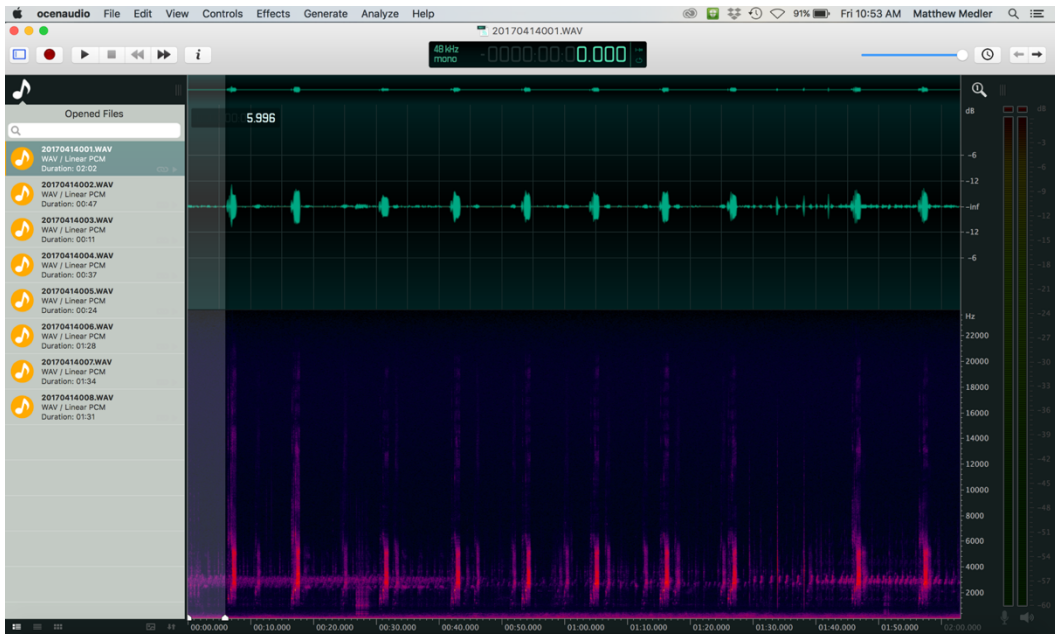


Stop! Have you backed up your sound files?

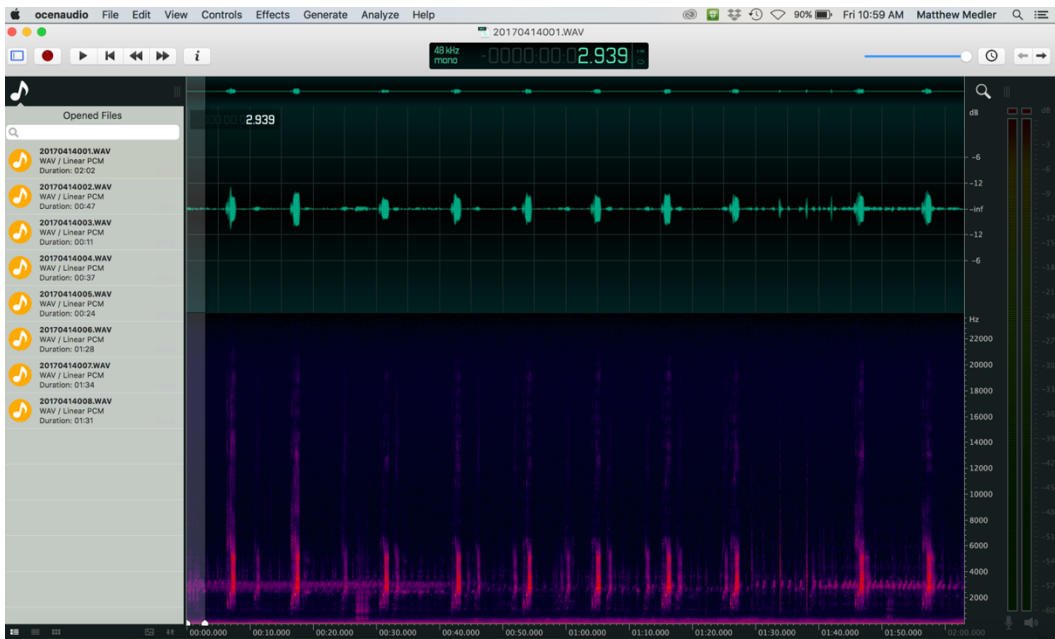
Before you start editing your sound files, you should make sure that you have a backup copy of your original sound files. The reason for this is that ocenaudio is a “destructive” editing program. This means that if you make changes to your sound files in ocenaudio and then press Save, the file is permanently changed. We recommend saving copies of your field recordings in two different places, and then when you edit your sounds in ocenaudio, save your changes using the Save As... function to save your edits in new sound files.

Trimming a sound file

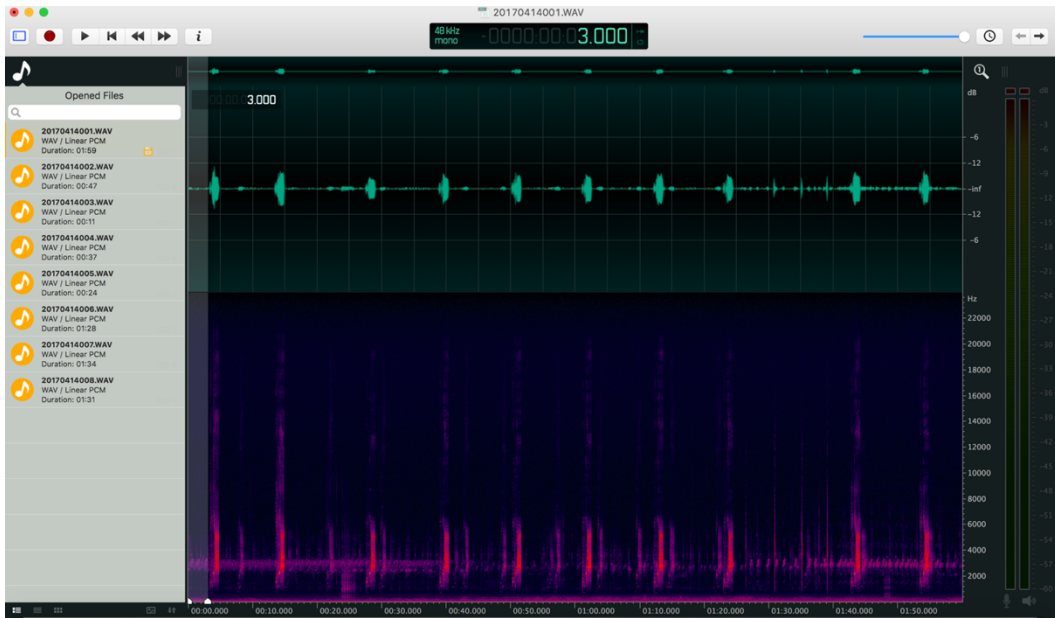
The first step in editing a sound file is a process that we call “trimming.” Trimming involves removing any extra, unnecessary audio from the start of a sound file and also from the end of the sound file. We recommend maintaining about 3 seconds of audio before the first sound from our target species, and then 3 seconds after the last sound from the target. (If there are less than 3 seconds before the first target sound, just delete any loud handling noise and keep whatever audio is left.) To determine how much audio is present at the start of a recording, first zoom in on the beginning of the audio. Then highlight the area before the first target sound, and the duration will appear:



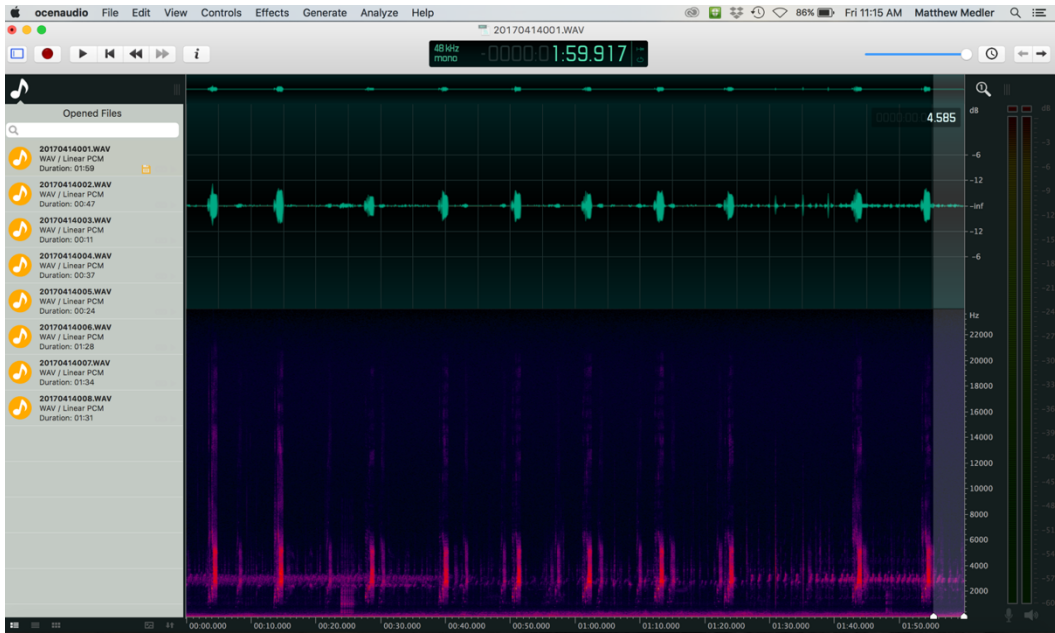
In this case, there are almost 6 seconds of audio before the first bird sound. The exact number is 5.996 seconds, which can be seen in the top left corner of the screen. We are only interested in keeping the three seconds immediately before the target sound, so the next step is to highlight 2.9 to 3.0 seconds of audio at the very start of the file:



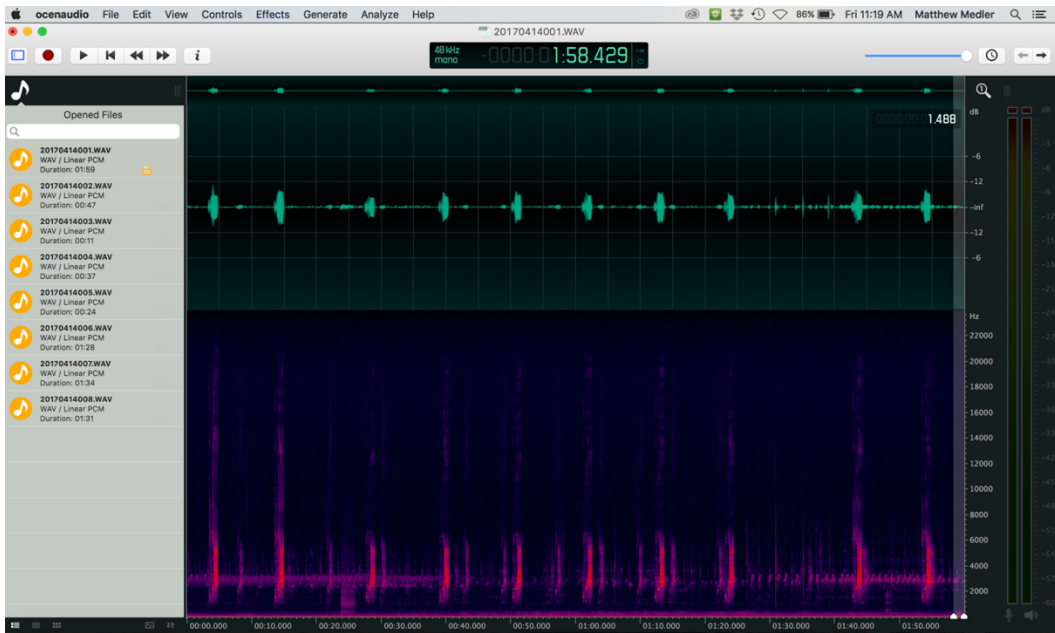
While this 2.939 seconds of audio is highlighted, press the Delete button, and the start sound file is now trimmed, with just 3 seconds of audio before the first target sound:



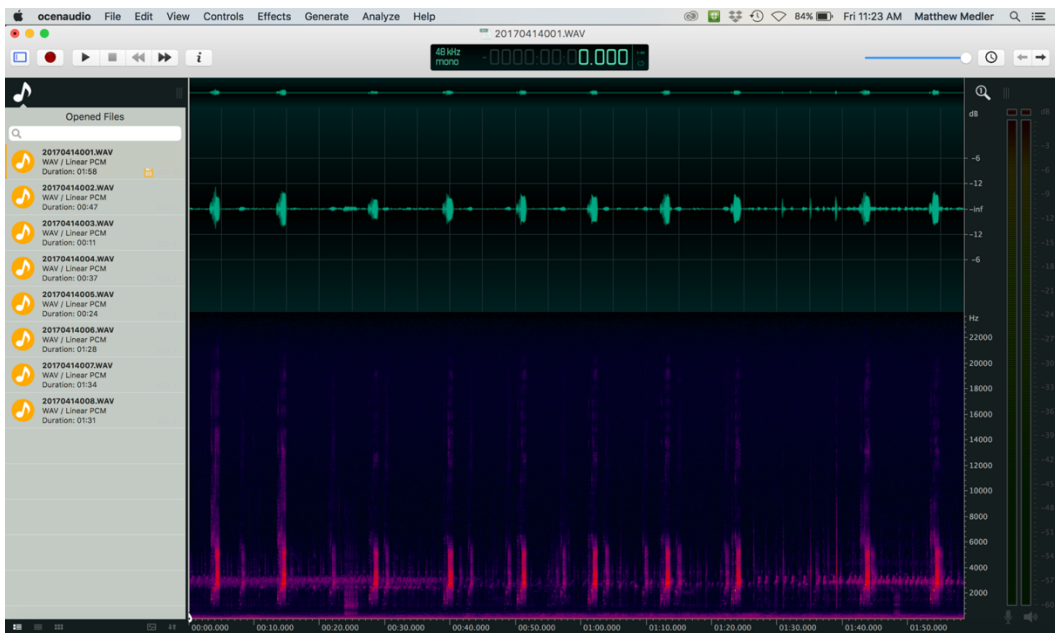
Then perform the same trimming process on the end of the recording:



In this case, there are about 4.5 seconds of audio after the last bird sound, so the trimming process will involve highlighting and then deleting 1.5 seconds of audio from the very end of the sound file:



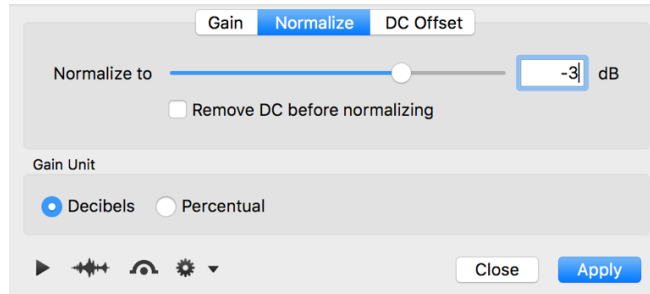
The end result of this trimming process is a sound file with three seconds of audio before the first target sound and three seconds of audio after the last target sound:



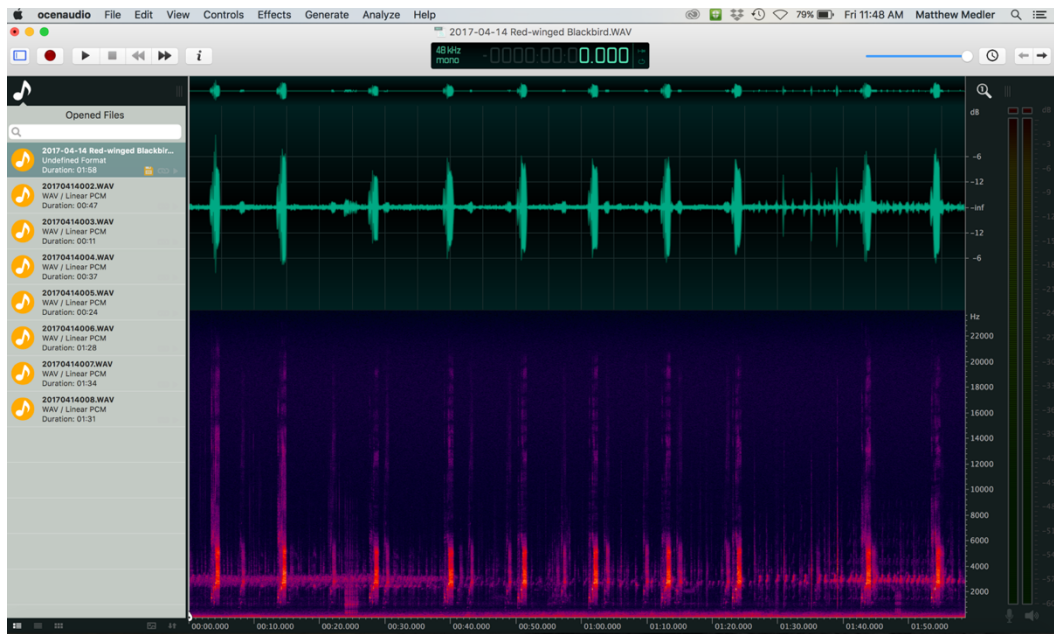
At this point in the process, perform a Save As...to save these edits under a new file name. Different recordists have different file naming systems, but we recommend one that contains at least two pieces of information: the date and the species name. In the current example, we will save this sound file as: 2017-04-14 Red-winged Blackbird.WAV

Normalizing a sound file

The next step in the editing process is to normalize the trimmed audio file. To normalize means to change the sound level of a recording so that the peak level of the recording matches a standard level. At the Macaulay Library, we normalize all archived sound recordings to -3 dB. To normalize a sound file in ocaudio, go to Effects...Amplitude→Normalize.... (Be sure to select this exact pathway, and **not** the similar Effects...Normalize.) Effects...Amplitude→Normalize... will result in the following window:



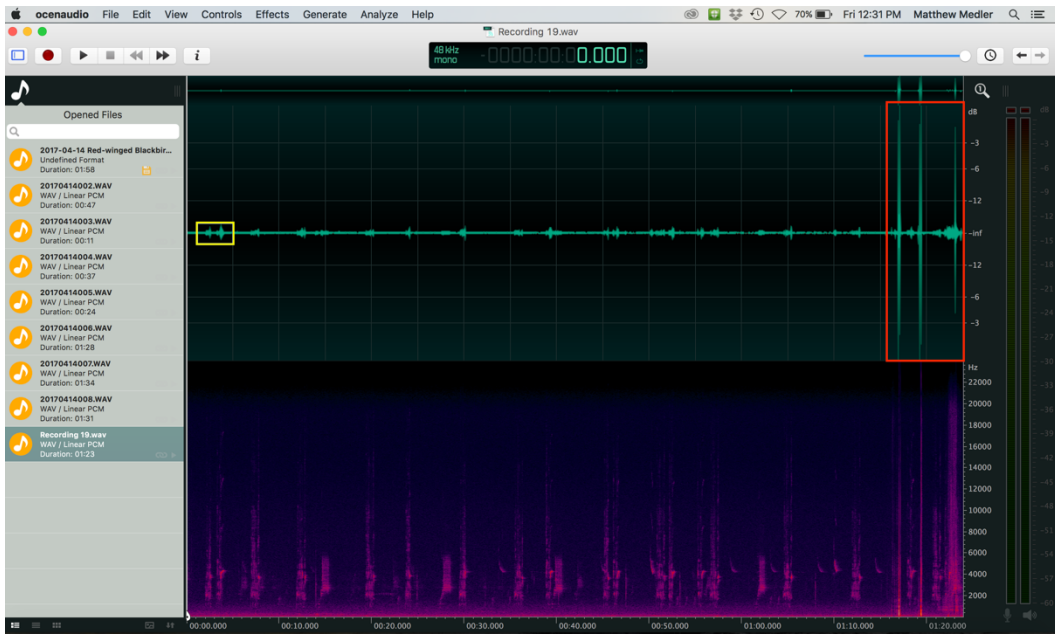
Once this window appears, select the Normalize tab, make sure that the Gain Unit is in Decibels, change the value to -3 dB (it's very important to include the negative sign!), and then press Apply. Here is the result of the normalization process:



If this sound file is the only recording for an individual bird, it is now ready to be uploaded to eBird and the Macaulay Library!

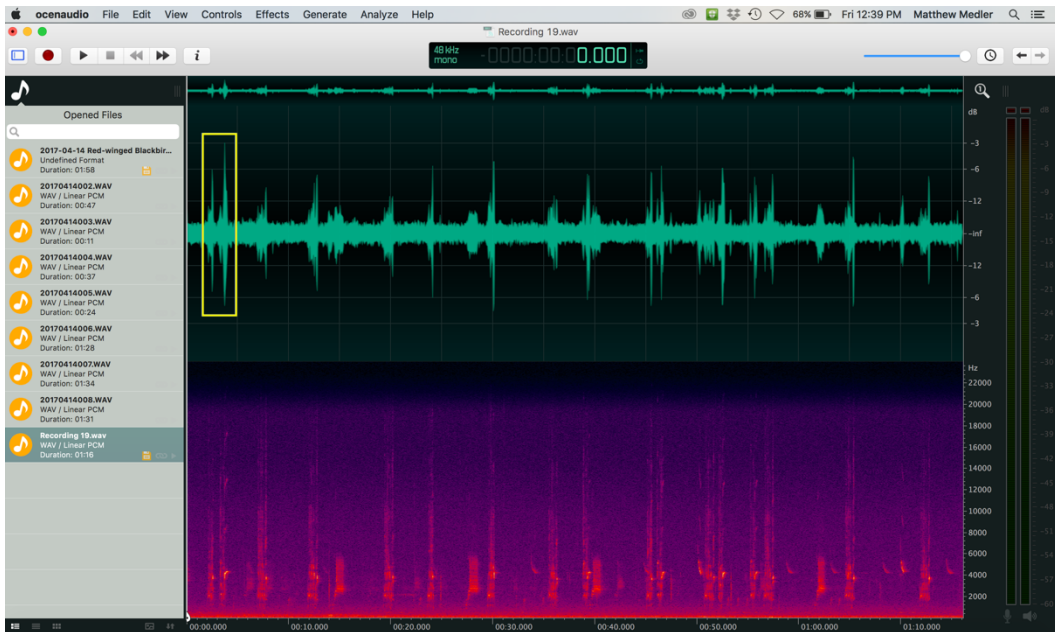
Why trim and normalize a sound file?

The combination of trimming and normalizing makes it much easier to hear the bird sound in a recording! Here is an example that shows the dramatic effect that trimming and normalizing has on a typical smartphone recording:



The blue box at the start of this recording shows the two loudest sounds from the target bird in the recording. The red box at the end of the recording highlights three very loud clicks that are the result of trying to turn off the mobile phone recording app. This handling noise in the red box is almost 25 dB louder than the target bird in the blue box. This means that at a normal listening volume, the target bird sound is nearly inaudible.

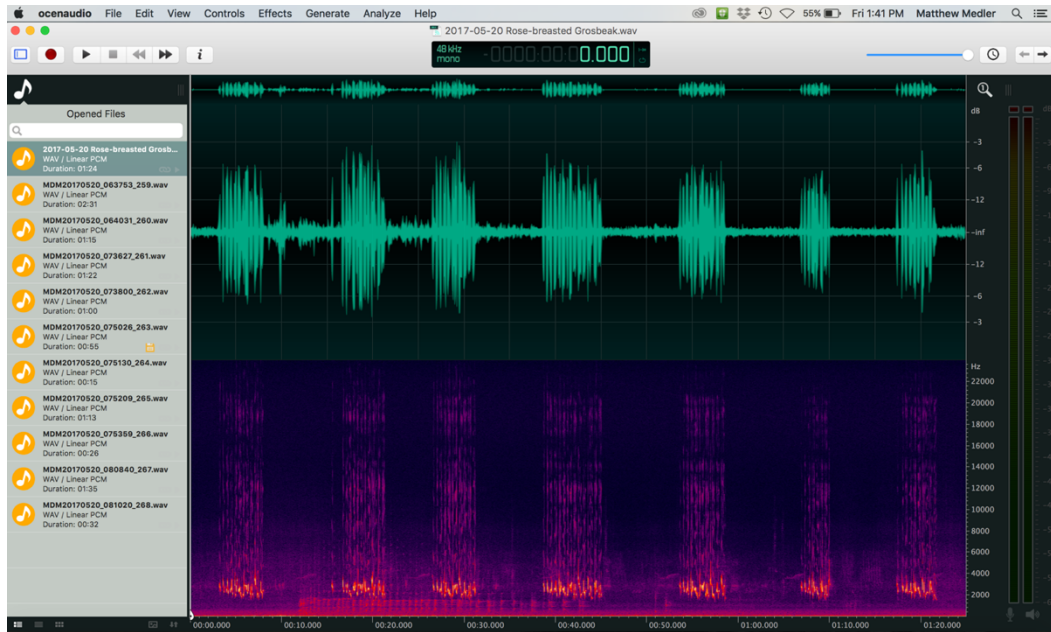
But, if this exact same recording is trimmed and then normalized, we can suddenly hear (and see) the target sound in great detail. Look at the difference:



Combining multiple sound files from a single individual

When a bird is cooperative, it is sometimes possible to record multiple sound files of that individual in the field. When it is time to edit and upload these recordings to eBird/ML, we recommend combining these sound files to create a larger, single file. Why? The Macaulay Library is a scientific archive used by researchers, and it is important for researchers to know when a series of recordings from one species represents a single individual or several individuals. The best long-term strategy for denoting that two or more sound files are from a single bird is to combine the files. Here is how to combine files:

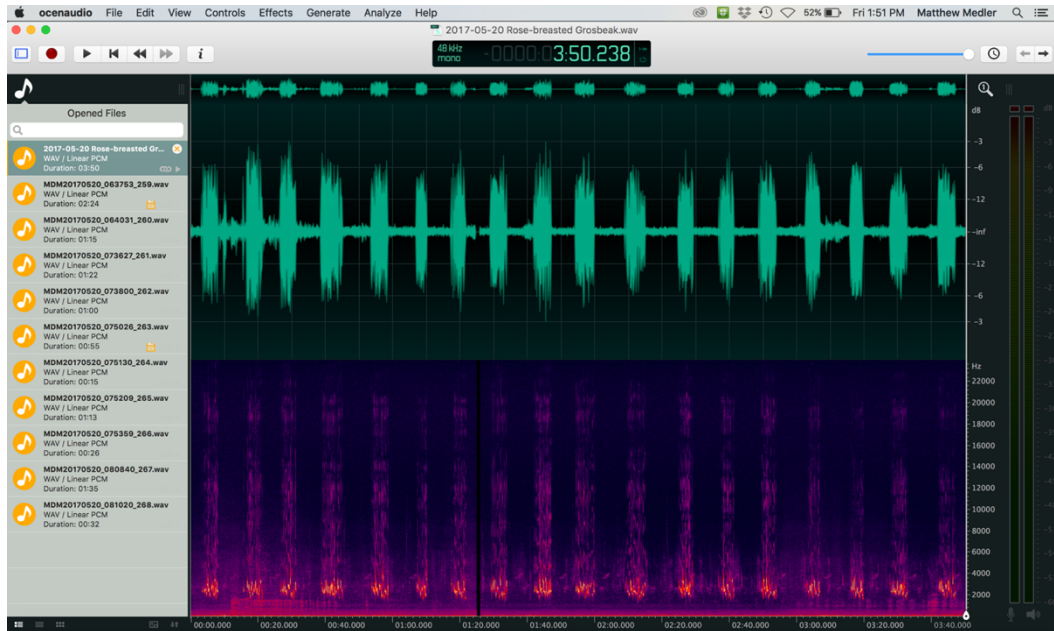
Edit the first sound file as described above, trimming, normalizing, and performing a Save As...



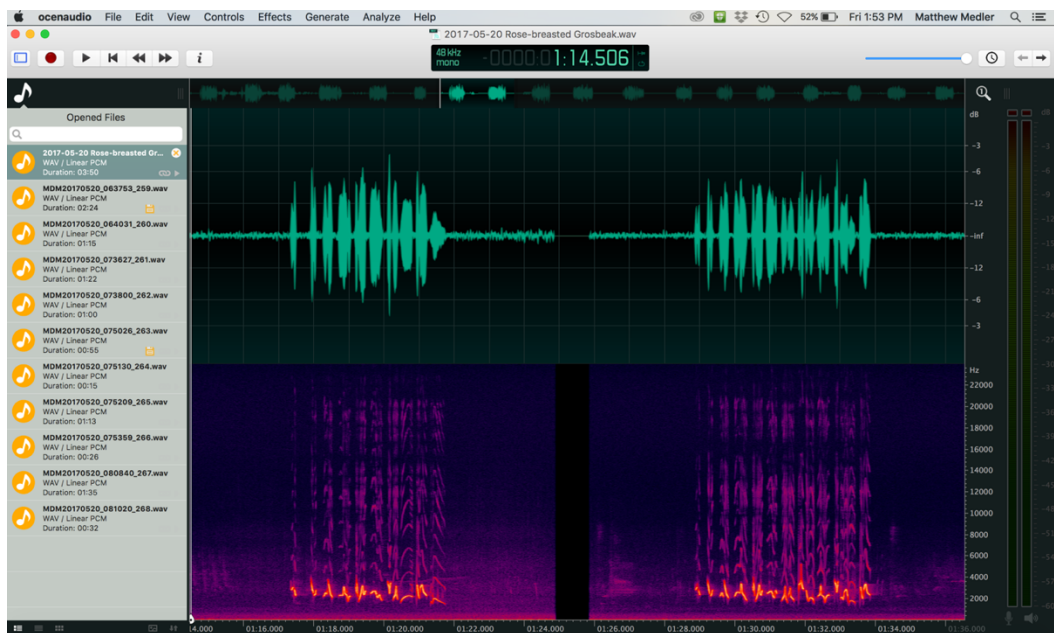
Once you know that you plan to add a second file to this first file, move your cursor to the very end of the first file, and add one second of digital silence by going to Generate...Silence. Zooming in on the end of the recording, we can see this silence as a black column:



Edit the second sound file from the same individual following the standard trimming and normalizing guidelines. When you have finished editing the second file, copy the contents of the second file, then go to the first file, move your cursor to the very end of the first file (after the digital silence), and paste the contents of the second file at the end of the first file. This approach maintains the original, natural progression of your recordings, while also using the digital silence to denote that there was a temporal break between the two segments.



Zooming in, the digital silence between the last song of the first sound file and the first song of the second sound file becomes more obvious:



Adding a voice announcement to a sound file

We encourage sound recordists to make voice announcements in the field, in order to capture important information about sound recordings right after making them. Some sound recordists prefer to add their voice announcements to the end of an upload file, while other recordists prefer to transcribe their voice announcements into written notes. Adding a voice announcement to a recording follows the same process as adding any other file, except that instead of normalizing the voice announcement to -3 dB, normalize it to -10 dB. Here's the previous recording with a voice announcement added to the end:



Setting up keyboard shortcuts

Editing sound files to upload to eBird/ML involves performing a few basic operations many times. Setting up keyboard shortcuts is a great way to quickly perform these functions and edit sound files more efficiently. To set up keyboard shortcuts in ocaudio, go to ocaudio...Preferences...Key Bindings. There, you can review all of the ocaudio actions for which you can establish keyboard shortcuts.

Here are some suggestions for useful keyboard shortcuts:

- Normalize: Adjusts audio volume to a standardized level (-3 dB for a recording, -10 dB for a voice announcement). The program will remember your last used value.
 - Command name: "Normalize..." under the "Effects" menu. It is important to select "Normalize..." and not "Normalize".
 - Suggested shortcut: n
- Insert Silence: Inserts digital silence at the selected point. The program will remember your last used value, which should always be "1 second" for archival editing.
 - Command name: "Silence", under the "Generate" menu.
 - Suggested shortcut: s

- Move cursor to beginning: Moves your cursor to the beginning of a sound file.
 - Command name: "Move cursor to begin."
 - Suggested shortcut: b
- Move cursor to end: Moves your cursor to the end of the recording.
 - Command name: "Move cursor to end."
 - Suggested shortcut: e
- Zoom In: Zooms in on the temporal scale (x-axis)
 - Command name: "Zoom In"
 - Suggested shortcut: down arrow
- Zoom Out: Zooms out on the temporal scale (x-axis)
 - Command name: "Zoom Out"
 - Suggested shortcut: up arrow
- Zoom Selection: Zooms in to a highlighted selection
 - Command name: Zoom Selection
 - Suggested shortcut: z
- Zoom Out Full: Zooms out to show an entire sound file
 - Command name: Zoom Out Full
 - f