



# **Devon Bat Survey**

## **Instruction Manual 2023**

### **Introduction**

Devon Bat Survey began through the Devon Greater Horseshoe Bat Project in summer 2016 with the aim of finding as many bats as possible. Please see [www.devonwildlifetrust.org/what-we-doour-projects/devon-greater-horseshoe-bat-project](http://www.devonwildlifetrust.org/what-we-doour-projects/devon-greater-horseshoe-bat-project) for further information. While the Devon Greater Horseshoe Bat Project came to an end in early 2021, Devon Bat Survey is continuing as part of the Saving Devon's Treescapes project led by Devon Wildlife Trust (DWT), with assistance from Devon Biodiversity Records Centre (DBRC), and funded by the National Lottery Heritage Fund. The aim is to find out more about all the bats which rely on ash and other trees, in some of the project's core areas and beyond. For more information on Saving Devon's Treescapes, please visit: [www.devonwildlifetrust.org/what-we-doour-projects/saving-devons-treescapes](http://www.devonwildlifetrust.org/what-we-doour-projects/saving-devons-treescapes).

Full instructions are below. If you have any problems/queries concerning any of the kit or the survey process, check our FAQs document which can be found on our webpage [www.devonwildlifetrust.org/devon-bat-survey-2023](http://www.devonwildlifetrust.org/devon-bat-survey-2023), along with the project **Risk Assessment, which you must read before deploying the detector**. Here you can also find documents such as Recording Forms, landowner permission forms and details of the Host Centres.

There is a video showing how to set up your bat detector available here: <https://youtu.be/A38bPYUTn7s>.

**If you have any questions, please contact Lindsay, the Devon Bat Survey Coordinator on 07909 490278 (Mon-Thurs) or email us on [bats@devonwildlifetrust.org](mailto:bats@devonwildlifetrust.org).**

**You will be invited to join the Devon Bat Survey What's App Group. This is a group in which to share photos of your detector in location (with you in the shot too, if you like). By sharing photos in this group, you are giving Devon Wildlife Trust permission to use them in our communications about the project and for marketing purposes. Please contact us if you do not wish your photos or comments to be used in this way.**





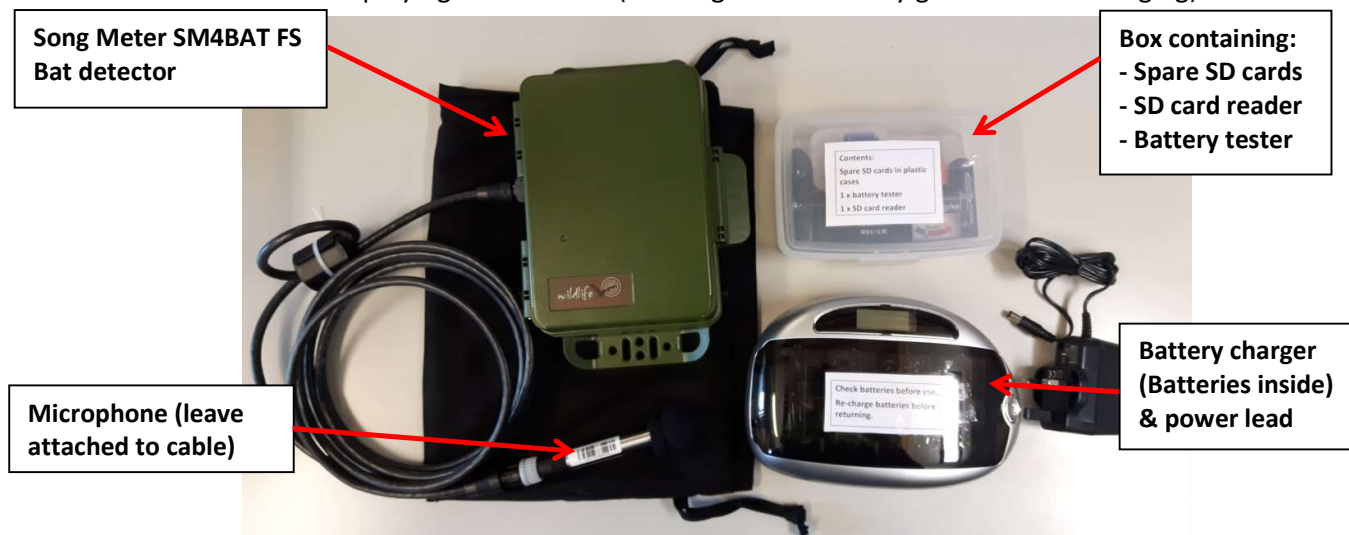
## Overview

The detector should be placed out for 3 nights **in a secure location** on the same afternoon that it is collected from the monitoring centre – please leave it in the same place each night. After the 3<sup>rd</sup> night of recording, you will use your computer to upload the sound recordings from the SD card in the detector to the BTO Acoustic Pipeline (see further instructions), then return the detector kit to the host centre on the same day **with one set of batteries charged ready for the next person**. (In rare circumstances, you may return the SD card in the freepost envelope provided, together with a completed recording form – please download this from the webpage. If you plan to do this, please contact the bat survey coordinator in advance). If your booking spans a period when your host centre is closed, you will have a slightly longer booking slot – you can leave the detector out for the whole time.

### Step 1: check the kit

- Check that the kit contains the correct equipment as shown in the photo as well as a bamboo cane, jiffy bag with a pre-paid stamp. You do not need to inform us if there are no spare SD cards in the kit box.
- **Make sure that the batteries are fully charged using the battery tester provided (they can take up to 6 hours to charge, so be sure to check them as soon as you can).**

Batteries should read 'good' on the battery tester's display. If not, charge batteries before deploying the detector (warning: batteries may get hot when charging).



- There should be at least one SD card with the kit. You can test these to make sure they are empty using the SD card reader in your computer (see photo on next page). If any



SD cards contain previous WAV files, do not use these but send them back to us with a note in one of the envelopes provided.



**How to test the batteries:** simply push the red slider as far to the right as it will go and insert the battery into the space (with positive charge on the right, next to the slider). Read the display to check that it says 'good'.



**How to check the SD card:** slot the SD card into the SD card reader (the writing on the SD card should be facing upwards) OR use the SD card port on your computer if you have one. Now insert the SD card reader into the USB port of your computer; a red light will show on the SD card reader when connected (Note: not all card readers may have a light). A dialogue

box should appear on your screen giving a few options, and you need to select 'Open folder to view files' – check that the next window says, 'This folder is empty'. Please note that we have several different SD card readers which all work in the same way. If no dialogue box appears you can check the SD card by finding 'SDHC' in your document library and double clicking. There should be no files within the card.

**IMPORTANT – You need to input the 4-digit Grid Reference location information into the bat detector**

To speed up the processing of the sound files recorded you need to change the file name on the bat detector. **You will need the four-digit grid square number for the square you selected at the booking stage (which is on the original square booking confirmation email). This should be the square of the location at which you will place the detector.** If you do not have this, you can get it by going to [www.gridreferencefinder.com](http://www.gridreferencefinder.com) and put in your location details. Click

on the right-hand button of the mouse to drop a pin where you will put the detector (if you are using a tablet, press and hold for 2 seconds on your site to drop the pin). This will give you





a 10 and a 6-figure grid reference. Take out the 3<sup>rd</sup> and 6<sup>th</sup> number from the 6-digit grid reference to get the four digit one e.g. SX654321 would have the 4 and 1 removed to become SX6532.

### Inputting your grid reference into the detector

Please DO NOT change the longitude and latitude on the detector – if you have changed it, please contact us as soon as you can.

1. Open up the detector lid and follow steps on inside lid of detector.
2. At step 4 do the following:
  - Scroll down to **'Settings'** and press enter.
  - Scroll down to **'Location'** and press enter.
  - At **'Prefix'** scroll right, to where it says **SURVEYSS1212 (or similar)**
  - Use the up and down keys to change the last 6 digits to the reference of your survey grid square. Once you have entered each character use the right arrow to move to the next character. Your entry should look something like **SURVEYSX1234**
  - Press enter until the cursor is flashing over the "–" in front of the word 'Prefix'.
  - Use the left arrow to navigate back to the main menu.
3. Continue to follow the instructions on the lid of the detector.

If the detector screen goes blank while you are navigating the menu, you can restart it by sliding the switch on the top right side of the detector to "EXT". Leave it for 30 seconds and then slide it back to "INT".

### Choosing the location for your bat detector

- Bats prefer quiet areas away from too much disturbance.
- Please do not put them in fields with livestock – they like to eat the microphones!

See below for some advice on potential detector locations:

Suitable locations	Unsuitable locations
<ul style="list-style-type: none"><li>• Hedges</li><li>• Lines of trees</li><li>• Old trees</li><li>• Orchards</li><li>• Leafy gardens with lots of shrubs</li><li>• Woodland glades</li><li>• Banks of rivers and streams</li></ul>	<ul style="list-style-type: none"><li>• Centre of open fields</li><li>• Areas where the detector is visible to the public</li><li>• Near streetlights and other well-lit areas</li><li>• Busy roads</li></ul>



- In areas without protection from livestock

### Important!

If you are placing your detector on land which you **do not** own, you **must** gain permission from the landowner first and make sure that the detector is not in danger of being stolen or removed by members of the public. You should speak to the landowner prior to selecting your grid square. A permission form and introduction letter are available on our website <https://www.devonwildlifetrust.org/devon-bat-survey-2023>. A copy may also be available in the survey folder in the detector kit box.

### Setting up the detector

Once you have chosen a suitable location for your detector and followed the instructions on how to enter your location, you will need to set it up ready for deployment.

1. Once the detector is set up it will say that it is going to sleep – this is normal; the detector will start to record before sunset and will go to sleep again in the morning after sunrise.
2. Attach the end of the microphone cable to the detector – this is a push fitting – then carefully twist the collar to lock it in position.
3. The microphone cable attached to the detector should be looped together with some garden wire; use this wire to attach the microphone to the bamboo cane provided. Extra wire is provided in case you want to attach the microphone to a tree instead of the cane. **Do not detach the microphone from the cable at any point.**
4. Take the detector and the cane out to your chosen location, push the thin end of the cane into the ground until stable.
5. Place the detector safely on the ground out of sight.
6. Secure the microphone to the thick end of the cane with the garden wire. Try to position the microphone to point outwards at a roughly 45° angle and with minimum vegetation in front of the microphone (see photo above). This will stop rain from interfering with the microphone. The squidgy cover on the





microphone should not be pushed all the way down as this will interfere with the recordings.

### **Charging the spare batteries**

While your detector is in place, **please re-charge the spare batteries ready for the next person.** The batteries may need up to 6 hours to re-charge (but should be less than this). Ensure the batteries are returned to the host centre with the charged batteries in the battery charger, and the used batteries loose in the box and not in the detector.

### **After 3 nights recording – dissemble and return the detector kit**

When your 3 nights recording has finished, please reverse the set-up process to pack away the detector kit. The batteries should be removed from the detector and placed loose in the box. The cable can be unplugged from the detector unit. **Do not disconnect the microphone from the cable.**

The SD card should be removed, and data uploaded to the Devon Bat Survey on the BTO Acoustic Pipeline (see next section). Once the data has been uploaded and saved, you can reformat the SD card (delete the data) and replace it in the box with the spare SD cards.

Place all the pieces of equipment back in the box as they were found. Loop the wire around the microphone cable. Don't forget to return the bamboo cane too!

Please do this on the final day of your detector hire and return the kit to your host centre during their opening hours ready for the next person to collect the following day.





## The BTO Acoustic Pipeline – Processing your data

### Uploading data and viewing results on the BTO Acoustic Pipeline

Congratulations on completing the recording part of the survey! All that remains is to upload the sound recordings from the SD card to the BTO Acoustic Pipeline via your computer, and then view your results.

1. You will have registered for a 'MyBTO' account when you signed up to take part in the survey. Log into your account at <https://bto.org/my-bto>.
2. You should also have downloaded the Acoustic Pipeline Desktop Client to your computer. If you did not do that, do it now by following the instructions in the appendix. Then come back and follow the next step.

### Uploading recordings for processing

**THIS MUST BE DONE ON THE FINAL DAY OF YOUR SURVEY BEFORE YOU RETURN THE DETECTOR KIT TO YOUR HOST CENTRE**

1. If you have an internal SD card reader on your desktop/laptop computer, insert the SD card containing your recordings. If you don't, please insert the card into the SD card reader provided and plug the SD card reader into a USB port on your computer.
2. Click on the 'BTO Acoustic Pipeline' icon on your desktop computer to open the 'Desktop Upload Client' that you installed previously.
3. When requested, enter your username and password to login.
4. Start new upload:
  - Click on 'Start New Upload' button.
  - Next to 'Choose files for upload', click on 'Select Files' button.
  - Now select the folder than contains the recordings that you want to process.

**IMPORTANT** - you are not able to select individual wav files within a folder **so just select the folder**. Please note .wav files in the folder are not shown by the Windows version of the App. This is not a problem – the recordings are in the folder you just cannot see them in the app.

5. Next to 'Add Survey Metadata', click on 'Enter Data' button.





## Updating Survey Metadata (providing additional information associated with recordings)

6. This section allows the user to provide an Upload Name for your survey – **PLEASE GIVE IT THE NAME OF YOUR SURVEY SQUARE e.g. SX1234.**
7. Please assign your recordings to the Devon Bat Survey.
8. Ensure that the location attached to the recordings is correct. To check the location attached to your recordings, please look at blue location pin on the map facility provided – if it is in the correct location of where you placed your detector, you have completed the survey metadata.
9. If the location is not correct, you will need to input the Latitude and Longitude. To do this, click on the button with the three white dots on the first recording row (to the right of the longitude box). Click 'Select a lat/long using the map'. Your mouse will change to a cross. Using the '+' and '-' on the left hand side of the map to zoom in and out, click on the correct location of where you placed your detector. The latitude and longitude will then update on this first row. To copy this correct location to the rest of the recordings, click on the 3 dots button and select 'Copy to subsequent files'.
10. Alternatively, you can find the correct latitude and longitude using <https://gridreferencefinder.com/> and manually input the lat and long (to 5 decimal points) to the first row, and then 'copy to subsequent files'.
11. Once you have completed the Survey Metadata, click on 'Save Data'.

The selected Project and Latitude and Longitude must be correct to ensure that the correct analysis is applied to the recordings, and that identifications of species that are 'rare or unexpected' are flagged.

## Preparing recordings for upload

12. Now click on 'Prepare Recordings'. You are now given the option to 'Create personal copy of recordings (optional)' if you wish to save a copy to your device.
13. Once the above is all complete, click on 'Start Upload' in the right-hand corner of the app to start the upload process.

## Once the upload has started

IMPORTANTLY – once the upload process has started, please note a backup copy has been saved to the app (you don't need to wait until upload has completed).

14. **Please delete any files or folders on the SD card (for use by the next person), safely eject the SD card, and return the SD card to the bat equipment box. You can then return your bat kit box to the Host Centre.**







Saving  
Devon's  
Treescapes



The Desktop Upload Client shows the progress of the upload. You can Pause and Resume the upload at any point, or if there is a break in internet connection. Note that the speed of upload can be very different depending on the speed of the user's broadband. It may take several hours to upload three nights of recordings and may best be left running overnight (in practice it will be rare it takes this long).

Once recordings have uploaded, you can close the Desktop Upload Client. You do not need to do anything else. You will be emailed once the results are ready to view. Results are normally returned within 24 hours of uploading.

## Accessing your results on the Web Portal

Once the recordings have been processed, you will be emailed to let you know that processing has completed, and the results will be accessible via the link in the email or, via the web portal <https://app.bto.org/acoustic-pipeline/datahome/data-home.jsp> and click 'My Uploads' from the top menu.

The Classifier results can be viewed online and/or downloaded as a spreadsheet (.csv file) by clicking on 'Download' under Classifier Results. The spreadsheet includes all results (one line for each wav file and species identified – so there may be more than one line for a wav file if multiple species are present in a recording), regardless of the confidence associated with the identification.

## Interpreting your results

The classifier will present results for every .wav file it identifies a species for. The key columns to note are highlighted in the screenshot below.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	RECORDING	ORIGINAL FILE NAME	ORIGINAL	LATITUDE	LONGITUDE	SPECIES	SCIENTIFIC	ENGLISH NAME	SPECIES GI	PROBABILITY	WARNINGS	ACTUAL D. SURVEY D. TIME	CLASSIFIER USER ID	UPLOAD K	UPLOAD N	SURVEY NAME			
2	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Myobra	Myotis bra Brandt's Bat	bat	0.19	Low confide	#####	07:00:19	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
3	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Myobra	Myotis bra Brandt's Bat	bat	0.95		#####	19:07:58	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
4	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Myodau	Myotis daubenton's Bat	bat	0.65		#####	19:45:28	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
5	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Myodau	Myotis daubenton's Bat	bat	0.27	Low confide	#####	23:26:05	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
6	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Myonat	Myotis nat Natterer's Bat	bat	0.91		#####	20:17:14	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
7	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Pippip	Pipistrellus Common Pipistrelle	bat	0.98		#####	17:56:04	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
8	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Pippip	Pipistrellus Common Pipistrelle	bat	0.98		#####	17:56:36	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
57	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Pippyp	Pipistrellus Soprano Pipistrelle	bat	0.99		#####	17:25:22	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
58	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Pippyp	Pipistrellus Soprano Pipistrelle	bat	0.99		#####	17:48:51	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
59	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Pippyp	Pipistrellus Soprano Pipistrelle	bat	0.99		#####	17:34:52	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
60	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Pippyp	Pipistrellus Soprano Pipistrelle	bat	0.26	Low confide	#####	07:59:06	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
61	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Pleaur	Plecotus a Brown Long-eared Bat	bat	0.5		#####	19:35:58	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
62	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Pleaur	Plecotus a Grey Long-eared Bat	bat	0.18	Low confide	#####	23:25:58	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
63	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Rhifer	Rhinoloph Greater Horseshoe Bat	bat	0.99		#####	17:03:57	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
64	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Rhhip	Rhinoloph Lesser Horseshoe Bat	bat	0.99		#####	18:35:43	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
72	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Rhhip	Rhinoloph Lesser Horseshoe Bat	bat	0.99		#####	19:45:03	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
73	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Rhhip	Rhinoloph Lesser Horseshoe Bat	bat	0.99		#####	22:36:15	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
74	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	Rhhip	Rhinoloph Lesser Horseshoe Bat	bat	0.99		#####	18:24:34	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
75	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	bird	bird specie Bird	bird	0.22	Low confide	#####	17:04:04	ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
76	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	No ID					#####		ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			
77	50°5973+	SURVEYSX7579_202	0	50.5973	-3.76751	No ID					#####		ClassifEsp (LMAHON)	20230420	Pete's dat	Devon Bat Survey			

**Original File Name** – this will show your survey square reference and the date and time of the sound recording.

**English Name** – this is where you will find the name of the bat species detected.



Devon Ash Dieback  
Resilience Forum





**Species** – this will show 'bat' but you may also see 'bird', 'cricket' or 'No ID' for species that the classifier identifies (or not, in the case of No ID).

**Probability** – the value in this column gives the degree of confidence in the identification of the species i.e. 0.98 is 98%; 0.22 is 22%. Our advice is to disregard identifications with low probability scores (this is why we manually verify the data before it is used scientifically). A warning appears next to those with low scores.

The number of times a species appears tells you how many times a bat of that species has been recorded passing by (which is different from the number of bats) – it could be many bats or just one bat flying past lots of times!

**IMPORTANT:** The results are produced for your information only and are indicative of the species present in the vicinity of your survey. As these results have been produced by the classifier and are not yet verified, they should not be reproduced or used without prior approval by Devon Wildlife Trust and must not be used for any development planning purposes. The data will be manually verified at the end of the survey season before it will be used scientifically, and a higher threshold of probability is applied to manual verification.

**Thanks for taking part in the Devon Bat Survey! We hope you enjoyed it.**



**If you have any questions, please contact Lindsay, the bat survey coordinator, on 07909 490278 (Mon-Thurs), or email us on [bats@devonwildlifetrust.org](mailto:bats@devonwildlifetrust.org).**

**You will soon receive a feedback request from us by email – we would love to receive your comments on the survey so that we can continue to improve it.**





## **Appendix:**

### **Downloading the Acoustic Pipeline Desktop Client**

- Install a copy of the Desktop Upload Client from the Acoustic Pipeline home page at <https://app.bto.org/acoustic-pipeline/public/login.jsp>. To download it, log into your account at the above page, and click on 'Desktop Client' in the top menu.
- Install the correct version (for Windows or for Apple Mac) for your computer. Links are given for both (for Windows users see the below Troubleshooting problem #1).

The Desktop Upload Client will make a folder on your hard drive where recordings will be stored temporarily during uploading. Once you open it and log in you are ready to upload recordings.

This small piece of software manages the uploading of sound recordings (with information about the location and dates/times) for processing. It will download the sound files from the SD card to your computer and store them safely until your computer finishes uploading them to BTO's servers for analysis.

## **Troubleshooting**

### **Windows Users - Troubleshooting problem #1.**

Windows Defender says the file might be harmful and not to run it! We are aware of this issue which occurs on PCs (but not Apple Macs). The app has been fully registered with Microsoft and is safe. However, Windows Defender, which protects your computer against viruses etc, will only stop highlighting any new apps once they have been downloaded 3,000 times! The image below is from Windows 10, other versions may vary. Some browsers may also show a similar message. Please click to save the app anyway. If you need help, please contact us at [bats@devonwildlifetrust.org](mailto:bats@devonwildlifetrust.org)





Saving  
Devon's  
Treescapes



Home Desktop Client My Uploads Projects Help


Dr P.W. Atkinson Logout

## Desktop Upload Client


Our desktop client allows you to easily upload BTO Acoustic Pipeline, by selecting recording cards. The process can be paused/resumed and recordings can be queued for upload at the

The desktop client is linked to your BTO Acoustic Pipeline. Once you have started an upload it will appear in this submission as it moves through the process

Use the download links below to install the client

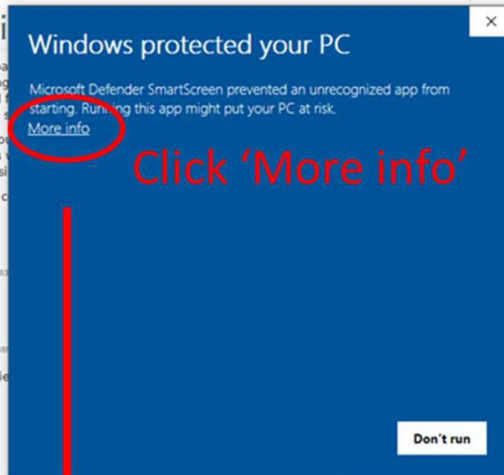
 Download for Windows  
Version: 4.402, 64-bit

SHA256 checksum: 7b914b324fda96a68a8022231c72f000e9b9682

 Download for Apple Mac  
Version: 4.402

SHA256 checksum: b39751ad517a3b8b1750f38952a8b15b816f38

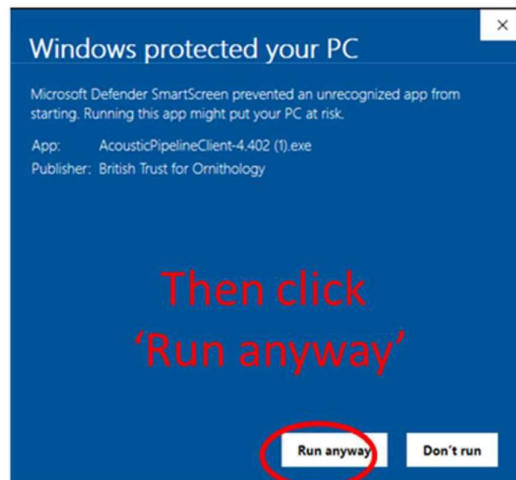
For assistance with using the client, or to view our help pages please see our [Help](#) pages.



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Registered Charity Number 216652 (England & Wales), SC039193 (Scotland).



Then click  
'Run anyway'

Run anyway

Don't run

### All users- Troubleshooting problem #2.

My username and password do not work in the Desktop App!



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Most people have had no problems using the Desktop App. However, a very few have had problems. Please remember that your password is CASE SENSITIVE. If you are having issues, please contact us at [bats@devonwildlifetrust.org](mailto:bats@devonwildlifetrust.org)



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