

# How to set up a Timelapse database using EcoAssist



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# Introduction

The Warddeken Land Management Mayh Project runs the largest species-monitoring network established by an Aboriginal organisation or Indigenous Protected Area (IPA) in Australia. Co-designed by Bininj leaders and Elders to detect long-term changes in key species, the project operates across 21 clan estates and involves Landowners from across the IPA.

To safeguard the health of the Kuwarddewardde mayh (Stone Country animals), Nawarddeken (people of the Stone Country) combine customary practices with modern land management techniques and technologies. One such technology is the use of the programs MegaDetector and EcoAssist to identify and remove images without animals, prior to uploading images to image ID programs such as Timelapse or CPW Warehouse. Searching empty images is a lengthy and tedious task and time saved since implementing these programs has empowered daluk (women) rangers to engage in a broader range of land management activities, increasing confidence and technological capacity in the workplace.

This tutorial will guide you through the setup of a basic Timelapse database, integrated with MegaDetector and EcoAssist. If required, the resources at the end of this document will guide you through advanced troubleshooting and functionality.

## How to use EcoAssist to set up a Timelapse database

Timelapse consists of two programs, Timelapse and Timelapse Template Editor.

Timelapse enables users to view and analyse subsets of images and categorise them according to species, location, time of day, overexposed or other categories. Timelapse Template Editor enables users to set up the Timelapse interface with the required categories and species. **EcoAssist** is a no-code user interface (after installation) that separates images with animals from empty images. EcoAssist does this using MegaDetector's artificial intelligence framework.

**MegaDetector** is an 'object detection program' which identifies animals, people and vehicles in images. It also identifies empty images.

## Folder setup

Create a folder for raw images from your camera traps.

#### Example:



Consider how you'd like to set up your file structure. If it is a one-off project, you might create a folder for that project and create a raw images folder within it. If it is an ongoing project, you might create a file for that project, then add subfolders for each year or time period that image collection will occur and then add a raw images folder for each time period. If you move folders at a later date, you will need to relink Timelapse to the new folder locations.

- Upload your SD cards into the **Raw Images** folder. Each SD card should have it's own folder, named after the camera number.
- If there are multiple folders on the SD card, copy the first folder's images across. Then, select all images in the second folder and rename them so that the number in the name is 10,000. If there is a third folder, select all and change the number to 20,000 and so on. Then copy those images to the folder. When there are multiple folders containing over 10,000 images on a single SD card, this preserves the order that the images were taken, so that we can easily find raw images if required.

Images >	Images for Timelapse Guide	> Raw Images		Search Ra
<b>e</b>	↑↓ Sort ~ 🗮 View ~			
Name	^	Date modified	Туре	Size
<mark>=</mark> W32		30/04/2024 3:31 PM	File folder	
🚞 W38		30/04/2024 3:31 PM	File folder	

• Create an additional folder for your images on the C Drive. EcoAssist will process images directly from this folder. Copy the subfolders containing your **Raw Images** folder to this folder. C Drive has less disk space than other drives, so if you have a large number of images, you may need to repeat the EcoAssist processing step multiple times with smaller batches of images, deleting a batch of images from C Drive as you complete it, then copying the next batch of folders across. Don't move anything within the Timelapse folder as it uses all these files to function.

# **Timelapse installation**

Download timelapse 2 from <a href="https://saul.cpsc.ucalgary.ca/timelapse/pmwiki.php?n=Main.Download2">https://saul.cpsc.ucalgary.ca/timelapse/pmwiki.php?n=Main.Download2</a>.

- Extract the Zip File and place it in your C Drive
- Create a shortcut for Timelapse2 and Timelapse2TemplateEditor for easy access on your desktop.

# Create a Timelapse Template

 Open Timelapse Template Editor. To create a Timelapse Template, you first need to save it to the same root folder as the images on your C Drive. When you save, it will automatically generate a Backups folder in this location. The Backups folder contains backups of your database file, never delete this folder.

	> This PC > OS (C:) > Monitoring		~ C	Searcl
	Name	Date modified	Туре	
	Backups	7/12/2023 1:39 PM	File fold	der
	🚞 W32	7/12/2023 1:36 PM	File fold	der
*	🔁 W38	7/12/2023 1:36 PM	File fol	der
*	TimelapseTemplateExample.tdb	7/12/2023 1:46 PM	TDB File	e

 Add a line with a count for number of animals in each image, a line with a note for comments, then a line with a choice, adding the species you are expecting to see to the box that appears when you click **Define List**.

Here we can also define our species list which can be a combination of common names and language names specific to your Country. In Timelapse we recommend you add all the names you want to use at the start.

- Add species as Fixed Choice.
- Add individuals as Count.
- Add good photo/empty/ID as Flag.
- Add metadata you might want to add as **Comment**.

As you add lines, a preview of how the Timelapse interface will display appears at the bottom of the template. From this template, you can rename the data labels by typing over them, re-order the columns at the bottom of the template, or toggle column visibility for the user.

	Default Value	Label	Data Label	Teable	Mildel.	Conveble	Visible	Elet	Ade
	Demont value	File	Film	The file name	100	Соруные	VISION	Lin	
lativePath	0	RelativePath	RelativePath	Path from the root folder containing the template and image data files to the file	100		2		(.a.
teTime	1900-01-01 12:00:00	DateTime	DateTime	Date and time taken (lear-Month-Day Hours:MinutesSeconds:Milliseconds)	160		1		Cho
eteFlag	false	Delete?	DeleteFlag	Mark a file as one to be deleted. You can then confirm deletion through the Edit Mere	20		1		No
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inder.	0	Individuals	Individuals	Click the counter button, then click on the image to count the entity. Or just type in a	30		2		
dChoice		Species 2	Species2	Choose an item from the menu	100	1	7	Define List	
inter.	0	Individuals 2	Individuals2	Click the counter button, then click on the image to count the entity. Or just type in a	30		V		Ron
0.		Comments	Comments	Write a textual note	100	1			
i i	false	Good photo?	Goodphoto	loggle between true and false	20		4		
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13	false	Empty	empty	Toggle between true and false	20.	1	1		
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the int	erface will (roughly) Relat	look like. Drag ar	nd drop cont	rols (by their labels) to re-arrange their order ateTime 01-Jan-1500 120000 🚭 🗸 Delete? 🚺 Species 🔍 V	() ke	dividuals	0	1	

• Open Timelapse 2, click **File** → **Load Template** and navigate to the template location on your C Drive.



We'll come back to Timelapse later...

Define choice menu, with 1 item per line	
Northern Brown Bandicoot	
Yok	
Agile Wallaby	
Kornobolo	
Merlbbe	
Warddadjangkal	
Northern Quoll	
Djabbo	
Brushtail Possum	
Djebuh	
Feral Cat	
Budjiked	
Crow	
Wakwak	
Water Rat	
Yirrkbadj	
Djirrkinj	
Mulbbu	
Common Rock Rat	
Arnhem Rock Rat	
Not sure	

✓ Include an 'empty' item

Cancel Okay

If you have set up your folders correctly, Timelapse should automatically load your images.



# MegaDetector and EcoAssist installation

- Install MegaDetector and EcoAssist from <u>github.com/</u> <u>PetervanLunteren/EcoAssist#windows-installation</u>.
- Download packages Git and Anaconda directly to your C Drive from <u>Gitforwindows.org</u> and <u>anaconda.com</u>.
- Right-click to open EcoAssist as an administrator on the installation download. A command prompt box will open.
- Specify where Anaconda3 and Git have been downloaded to in your C Drive.

Administrator: C:\WINDOWS\System32\cmd.exe ding to install.. roceeding to install... istall script is located on drive: 'C:' coAssist will be installed on drive: 'C:' 'C:' hanged drive to: C:\Program Files' 'C:\Program Files' 'C:\Program Files\EcoAssist\_files' 'C:\Program Files\EcoAssist\_files' 'C:\Program Files\EcoAssist\_files' ocation: emoved reated empty dir nter path to conda installation (for example C:\ProgramData\anaconda3): C:\Users\CaraPenton\anaconda3 ath to conda is defined as: 'C:\Users\CaraPenton\anaconda3' nter path to git installation (for example C:\Program Files\Git): C:\Program Files\Git nter path to git installation (for example C:\Program Files\Git): C:\Pr ath to git is defined as: 'C:\Program Files\Git' % Total % Received % Xferd Average Speed Time Time Time Dload Upload Total Spent Left 00 56832 100 56832 0 0 38609 0 0:00:01 0:00:01 --:-:--Time Current Left Speed --:-- 38608 100 56832 100 56832 0 ello world Administrator: C:\WINDOWS\System32\cmd.exe oassistcondaenv \* C:\Users\CaraPenton\anaconda3\envs\ecoassistconda Volume in drive C is Windows Volume Serial Number is 8222-E54E Directory of C:\Program Files\EcoAssist\_files 3/05/2023 05:29 PM 3/05/2023 05:31 PM 3/05/2023 05:31 PM 3/05/2023 05:30 PM 3/05/2023 06:34 PM ai4cutils <DIR> alaeutils cameratraps EcoAssist 30,271 installation\_log.txt labelImg 31 path\_to\_conda\_installation.txt 22 path\_to\_git\_installation.txt pretrained\_models <DTR> 3/05/2023 05:31 PM 3/05/2023 05:30 PM 3/05/2023 05:30 PM 3/05/2023 05:32 PM 3/05/2023 05:30 PM [3/05/2023 05:32 PM <DH> pretrained\_m ]/05/2023 05:30 PM 56,832 wtee.exe ]/05/2023 05:31 PM <DHR> yolov5 4 File(s) 87,156 bytes 7 Dir(s) 622,924,422,904 bytes free installation ended at Sat 13/05/202318:34:15.83 Installation ended at Sat 13/05/202318:34:15.83 1 file(s) moved. 1 file(s) moved. 1 file(s) moved. If EINSTALLATION IS DONE! You can close this window now and proceed to open EcoAssist by double clicking h file in the same folder as this installation file (so probably Downloads). (ecoassistcondaenv) C:\Program Files\EcoAssist\_files>

Move the EcoAssist shortcut from Downloads to your preferred area.

Once entered the prompt will download everything you need to run MegaDetector. This can take up to 40 minutes depending on internet connection and computer processing capacity.

# Using EcoAssist to process images

- Open EcoAssist. The program will ask permission to make changes to your computer, click yes. It will initially open a command prompt box, but will convert to a user interface a few seconds later.
- Browse to the folder where your images are stored on the C Drive. Select the boxes in the image below and set the checkpoint frequency to 500.

∉ EcoAssist v4.0				9	o x
	K	EcoAssist No-code platform to train and deploy ML	NTE SANK	1	
Deploy Train Annotate Help About					
Step 1: Choose folder to analyse - Change folder?					
Step 2: Run model		Step 3: Post-processing (option			
Model	MegaDetector 5a 🛁	Destination folder		Bri	owse
Don't process subdirectories	Г	Separate files into subdirectories		-	
Exclude detections from output file	Г	L Separation options			
Use custom image size	F	Method of file placement		Copy	C Move
Use absolute paths in output file	Г	Sort results based on confidence		<b>—</b>	
Process all images in the folder specified	<b>v</b>	Draw bounding boxes and confidences		-	
د Image options		Crop detections		-	
Use checkpoints while running	<b>A</b>	Create annotations in YOLO format		-	
L Checkpoint frequency	500	Export results to .csv files			
Continue from last checkpoint file	Г	Confidence threshold	0.2		_
Process all videos in the folder specified	Г	Post-proce	ss files		
r & Video options		1			
Don't process every frame	E				
L Analyse every Nth frame	E.g.: 10				
Deploy mod	el				

• Click Deploy model. A progress box will appear.

EcoAdsit v4.0 Deploy progress EcoAdssist No code platime to train and deploy ML.		EcoAssist No-code platform fo train and deploy ML	
Percentage done: 11% Processing image: 24 of 219 Elipted time: 0004 Remaining time: 0003 Image per sec: 5.51 Running or: GPU	MegaDetector Sa	Step 5: Post-processing (optional) Definition folder	Browse
Cancel		Separate files into subdirectories	
Exclude detections from output the		Separation options	R Care C Mara
Use custom image size	F	Seat rends based on confidence	Copy C Move
Use absolute paths in output file		Sort results based on controlence	
Process all images in the folder specified	v	Draw bounding boxes and confidences	П
L Image options	_	Crop detections	E .
Use checkpoints while running	N	Create annotations in YOLO format	E
L Checkpoint frequency	500	Export results to .csv files	E
Continue from last checkpoint file	Г	Confidence threshold	0.2
Process all videos in the folder specified	Г	Post-process files	
- Video options			
Don't process every frame	П		
L Analyse every Nth frame	E.g.: 10		
Depley model			

If you have poor internet connectivity or do not have access to a high-powered computer, it may be beneficial to set checkpoint frequency to 50, so that progress is saved every 50 images, rather than every 500.

Depending on the power of your PC and number of images that need to be processed, it may take anywhere from minutes to weeks to complete this step. For example, we used a lowerpowered PC to process 20,000 images and it took 24 hours to process. In contrast, we processed millions of images on a high-powered PC, which took around a week and half of 24/7 processing.

You may need to change the settings on the PC so that it doesn't go to sleep if left to process overnight. • Once image processing is complete, the below files will have been added to your image folder in C Drive.

1	> This PC > OS (C:) > Monitoring		~ C	Search
	Name	Date modified	Туре	
	📒 Backups	7/12/2023 2:00 PM	File fol	der
	<b>W</b> 32	7/12/2023 1:36 PM	File fol	der
*	📜 W38	7/12/2023 1:36 PM	File fol	der
*	image_recognition_file.json	7/12/2023 2:19 PM	JSON F	ile
*	TimelapseTemplateExample.ddb	7/12/2023 2:00 PM	DDB Fi	le
*	TimelapseTemplateExample.tdb	7/12/2023 1:46 PM	TDB Fil	e

**Backups** is a folder that is automatically generated by Timelapse and contains backups of your database file. **Never delete it.** 

**Timelapse Data** (.ddb) is a database file created and updated by Timelapse as you load and analyse your image set. The file stores all the data that you entered, as well as other information required by Timelapse. **Never delete it.** 

JSON File is your AI file from EcoAssist. Never delete it.

# Clearing C drive and relinking the database to the raw images folder

Use the below steps to move and link files to the **Raw Images** folder in preparation for deleting files from the C drive.

 Move all Timelapse files and the image recognition JSON file to the Raw Images folder.

As the Timelapse template and image pathways are linked to the C Drive images folder, you will need to update image file pathways to reflect their new location in the **Raw Images** folder.

 Open Timelapse → Load Timelapse Template and use the Locate button to navigate to the Raw Images folder where the template is now stored and click Use New Location.

Raw Images is your working folder and these files must be in the same root folder as the images for the program to function. • To link image folders to the **Raw Images** folders, go to the **Edit** tab → **Try to find any missing folders**.

File Edit	Options View Select Sort Recognition	s Window H	lelp
Data	Find file	control-F	
File	Show QuickPaste Window Import QuickPaste Items from .ddb file	Q	)9-Mar-2023 15:34
Instr	Copy previous values Restore default values for this file	C	
2	Populate one or more fields with metadata Populate a field with episode data		5
	Duplicate this record		1 Acres
	Delete Date correction		
	Try to find this (and other) missing files Try to find any missing folders		
<b>S</b> .	Populate a field with Dark classification data		117

• The below screen will appear, use the **Locate** button to navigate to the corresponding folder in the **Raw Images** folder. Repeat this for all folders, then click **Use new locations**.

	Some rolders could r	lot be lound. Please loca	te un	enn.		
Problem:	Timelapse failed to find the imag	e folders listed below in their expected l	location			
Reason:	The folders may have moved or r	renamed.				
	If it found any, they listed in a dre • verify each possible new locatio - see what locations are availal - select 'View' to examine that • if the possible locations are wro • check the 'Use' checkbox to use	op-down menu as possible new location n: be in each menu and select the most likk location in Window's File Explorer. ong or empty: select 'Locate' to navigate e that new location for your missing file, etian will show image data along 'miss	is for yo ely one, to the or unch ing' pla	correct neck it t	location. to ignore er image.	it.
Hint:	Folders with empty or wrong loca You can try to locate that folder a	again later (see the Edit menu).	ing più			
Hint: Folder name	Folders with empty or wrong loca You can try to locate that folder a	Possible new locations	ing più	Use?		
Hint: Folder name W32	Folders with empty or wrong loc: You can try to locate that folder a Expected old location W32	Possible new locations MD_Images\W32	v v	Use?	Locate	View
Hint: Folder name W32 W38	Folders with empty or wrong loc: You can try to locate that folder a Expected old location W32 W38	Possible new locations     MD_Images\W38	~ ~	Use?	Locate	View

Once this is complete and you have checked that your Timelaspe 2 database is functioning correctly, you can delete the image folders on your C Drive and prepare to copy across and process the next batch of images.

# Preparing a Timelapse 2 database

### Load the Timelapse Template

 Go to the File tab → Load template and browse to your Timelapse Template in your image folder on C Drive, then click OK. Your images should load automatically.

•	Timelapse: Helping You Analyze Images and Videos Captured from Field Came	eras
File	Edit Options View Select Sort Recognitions Window Help	
*	Load template, images, and video files Load a recently and image Asks for the template location, and then opens an existing image	ge set datal
<b></b>	Upgrade Timelapse files (.tdb/.ddb) to latest version	ion set
a a	Merge data (.ddb) files into a single file Export data in the current selection as a .csv file Export data in the current selection as a .csv file and preview in Excel	Mai
B.	Import data from a .csv file Export (copy) the current image or video file	interna
	Export (copy) all images and video files in the current selection Rename the data (.ddb) file for this image set	upgrad ne time ity field
× ×	Close image set Exit	ed Dark t in Opt

## Load image recognition file

 Go to the Recognitions tab → Import image recognition data for this image set and browse to your image recognition file which is now in the Raw Images folder.



## Populate metadata

Camera-trap images contain metadata: data describing time, temperature, type of camera, moonphase etc. Some of this can be very useful for science!

- Select **Edit** from the menu.
- Choose **ExifTool** as the inspection tool.
- Click the **Data fields** from the right-side column that you would like to include.
- Click the **Populate** button to load the metadata for those fields.

?)	Populate Data Fields with S	elected Metadata	Hide explanat
What:	Images often embed metadata, some of wh You can direct Timelapse on how to popula	ich may be useful to capture as data. te data fields with metadata.	
iolution:	Match the desired metadata to a data field 1. Inspect the current file's metadata (and it 2. For each metadata of interest, use the dri 3. Click the Populate button to apply your n	to populate those data fields for all your currently selected file s example value) to see if your files contain metadata of interer op-down menu to select which data field should be populated netadata selections to all your currently selected files.	s. st with the metadata's value.
esult:	Each file's data fields will be populated with	each file's metadata values for the metadata fields selected.	
lint:	Try both inspection tools: MetadataExtracto Only Note fields can be populated Be patient! It does take time to do this (esp	r is faster. ExifTool is better at finding all metadata fields but m becially with ExifTool) if you have a large number of files.	uch slower.
hoose a m kample file	etadata inspection tool: O MetadataE :: IMG0018JPG	xtractor (faster)	Details
Metadata	name	Example value from current file	Data field
Ambient 1	emperature	29 C	Temperature v
Ambient 1	emperature Fahrenheit	85 F	~
Battery Vo	ltage	8.57 V	~
Bits Per Sa	imple	8	~
Brightness	5	0	*
	lodel Name	PC850 PROFESSIONAL	Camera model name Y
Camera M		3	v
Camera M Color Con	ponents		
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Camera M Color Con Color Spa Compone	nponents ce nts Configuration	sRGB Y, Cb, Cr, -	v v
Camera M Color Con Color Spa Compone Contrast	nponents ce nts Configuration	sRG8 Y, Cb, Cr, - 128	
Camera M Color Con Color Spa Compone Contrast Create Da	nponents ce nts Configuration te	sRGB Y. Cb, Cr, - 128 2023.03.09 15:35:15	* * *
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Camera M Color Con Color Spa Compone Contrast Create Da Date/Time Directory	nponents ce nts Configuration te e Original	sRGB           Y, Cb, Cr, -           128           2023.03.09 15:35:15           2023.03.09 15:35:15           //WARD-ECOLOGY/Ecology NAS/WLML Camera Monitoriri	•           •
Camera M Color Con Color Spa Compone Contrast Create Da Date/Time Directory Encoding	nponents ce nts Configuration te e Original Process	sRGB           Y, Cb, Cr, -           128           2023.03.09 15:35:15           2023.03.09 15:35:15           //WARD-ECOLOGY/Ecology NAS/WLML Camera Monitoria           Baseline DCT, Huffman coding	•           •
Camera M Color Con Color Spa Compone Contrast Create Da Date/Time Directory Encoding Event Nur	nponents ce nts Configuration te e Original Process nber	sRGB           Y, Cb, Cr, -           128           2023.03.09 15:35:15           2023.03.09 15:35:15           //WARD-ECOLOGY/Ecology NAS/WLML Camera Monitoria           Baseline DCT, Huffman coding           4	•           •

#### We suggest:

- Temperature
- Camera Model Name
- Moonphase
- Sequence
- Camera Label.

## Creating quickpaste entries for tagging images

Make one quickpaste for each species you commonly record.

 Select Edit → Show Quickpaste Window, then click on Species and deselect the others. Select the species name you want to use.



File: 76 of 219 Select: All files Sorted by: RelativePath1 then by Date/Time1

#### Select images of animals

- Go to the Select tab → Custom selection, then click the Use recognition box.
- Use the Recognised entity drop down box to view images of animals, people, vehicles, all or empty.



• Click the **RelativePath folder** and select the camera you would like to view from the dropdown box. Click **OK**.

Select and View a Subset of your Files In the open and the image of the second set of the subset of your images and videos that fit some criteria of interest to you. Select and View and ye subset of your images and videos that fit some criteria of interest to you. Select and View and ye subset of your images and videos that fit some criteria of interest to you. Select and view only a subset of your images and videos that fit some criteria of interest to you. Select and view only a subset of your images and videos that fit some criteria of interest to you. Select and view only a subset of your images and videos that fit some criteria of interest to you. Select and view only a subset of your images and videos that fit some criteria of interest to you. Select and view only a subset of your images and videos that fit some criteria of interest. Select and view on the indicated characters (1)-27 matches on our other indicated characters. Select and videos that match these terms Select label Select and videos that match these terms Select label Select and videos that match these terms Select label Select and videos that match these terms Select label Select and videos that match these terms Select sole of the indicated characters. Select and videos that match these terms Select and videos that match these terms Select sole of videos and videos video v	Select a	nd view a subs	et of y	your files				- C	) ×
Atta:       You may want to view only a subset of your images and videos that fit some criteria of interest to you.         Outline:       Specify the search terms that describe your criteria.         1. Each row below reflects your data fields or (if enabled) specific recognition data.         2. Hypu have selected multiple terms in the lower area, select how those terms should be combined.         esuit:       Only those images and videos matching your search criteria will be displayed.         int:       Globar pressions are case sensitive and Jone wildcards as follows:         • Introduce and pressions are case sensitive and 2 matches one charecter in the range of indicated characters.         Image Recognition       • Introduce case sensitive and 2 matches one charecter in the range of indicated characters.         Image Recognition       • Rank by confidence         • Use recognition       • Show only those files the recognizer did not process         Confidence:       from 0.20 to 1000*         • Include all files in an episode when at least one file matches       3 files match your query         Select       Label       Expression         Value       15-Mar-2022       •         • Date       \$ viac       15-Mar-2022         • Date       \$ viac       •         • Species       •       •         • Date       \$ viac       •         •	?	Select a	nd \	/iew a Su	ıbset of your Files			🗌 Hide	explanat
Intermediation of the control of the depole into the control in the control on interfere to you:         Intermediation:       Select one or more rows and adjust if a value to reflet excognition data.         2: Select one or more rows and adjust if a value to reflet duplayed.         int:       Since one or more rows and adjust if a value to reflet duplayed.         int:       Since one or more rows and adjust if a value to reflet duplayed.         int:       Since one or more rows and adjust if a value to reflet duplayed.         int:       Since one or more rows and adjust if a value to reflet duplayed.         int:       Since one or more rows and adjust if a value to reflet duplayed.         int:       Since one of the indicated characters: [a-2] matches one character         - [abc] matches any number of characters and 7 matches any single character       - [abc] matches cone of the indicated characters: [a-2] matches one character in the range of indicated characters.         Image Recognition       Recognition (and these terms)       Show only those files the recognition ding ANO:         Include all files in an episode when at least one file matches       3 files match your query         Select Label       Expression Value       These terms are combined using ANO:         RelativePath folder       W32       Interme (htmmmss) instead of date         Date       15-Mar-2023       Use time (htmmmss) instead of date         Delete?	/hat:	You may wan	t to v	iew only a sub	yset of your images and videos	that fit so	me criteria of interest to you		
	olution:	Specify the e	earch terms that describe your criteria						
Sult: Only these inages and videos matching your search criteria will be displayed.  Int: Glob expressions are case sensitive and allow wildcrafts as follows:	olution	1. Each row b 2. Select one	or me	reflects your of ore rows and a	data fields or (if enabled) specif adjust its values to reflect your s	ic recogni search cri	ition data. teria .		
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Now, only images containing animals from the camera you've specified will be displayed on the screen. These images are ready for identification.

# Double checking your work!

Consider this a bit like quality control, the person who set up the camera database should look at each camera site Timelapse database and make sure IDs are all good, all the fields are filled in and look for any errors or images that have not been tagged as either empty or an animal.

If you have used a language name that can mean more than one species (e.g. mulbbu for all small rodents/dasuryids) it is important to change this to a unique name (e.g. common name like Arnhem rock rat or common rock rat) before exporting the data. This means you don't need to go back and check the image again.

#### Checking images and individual site-based Timelapse databases

The **Select** and **Custom Selection** tools are your friends here! Look at how the number of files that match your query changes:

- Select
- Custom Selection
- Select what photos you want to find (good photos, species names to review, empty).

#### **Checklist:**

- All images either have a SpeciesID or are tagged as 'empty'
- Check unknown animal
- Review language names that occur for multiple species.

You can also use the same function to filter your images and export them into folders that you can share with Landowners.

From the File menu select Export (copy) all the images and video in the current selection.

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## **Exporting data**

• Once image ID is complete, data can be exported. Go to the **File** tab → **Export data in the current selection** → **OK**.



If you would like to export data for all images, you will need to remove your custom selections. Go to the **Selections** tab  $\rightarrow$  **Custom selection**  $\rightarrow$  **Reset to all images** (bottom, left hand side of the screen).

#### **Exporting images**

 If you would like to export your selected animal or other images for other purposes go to File → Export (copy) all images in the current selection.

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Select a folder for animal images to be copied to. Timelapse will automatically generate a subfolder in this location if you select **Put in Subfolder** and provide a name  $\rightarrow$  **Export**.

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?	Export (by copying) 88 currently selected files							
What:	Copy all the images or video files in your current selection to a chosen folder.							
	You can optionally rename files to include a prefix of their original folder loca For example: 'img01.jpg' in 'Site1/Camera1' is exported as 'Site1.Camera1.ing • Renaming helps you match the copies with their originals • However, it only works if no duplicate file names exist across subfolders	tion. j01.jpgʻ						
Result:	Copies of your image and video files will be found in the folder below. • the original files will not be altered. • 'Rename' checked: a prefix is added to the exported file name • 'Rename' unchecked: if duplicated file names exists, it aborts the operation							
Hint:	You can narrow your selections to particular files via the 'Select' menu.							
Folder:	amera Monitoring Project\Images\Images for EcoAssist Tutorial\MD_Images	Choose fol	lder					
	✓ Put in Subfolder: W38							
	Rename files to include their subfolder location, if any							
	Cance	Evpo	ort					

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# **Appendix: Species names**

To aid with creating species name lists and reviewing, you may want to create a database of known species names. As long as all species have been tagged with a name that identifies back to the common name these can be renamed later (e.g. kornobolo, warradjankal) in R or Excel.

Common name	Scientific name	Taxa	Other names
Agassiz's Glassfish	Ambassis agassizii	Fish	djenj
Agile Wallaby	Petrogale brachyotis	Mammal	kornobolo,warradjangkal (male), merlbbe (female), nakornborrh (juvenile male), nakurdakurda (large male)
Alana's Menetia	Menetia alanae	Reptile	burndjingh, loklok
Antilopine Wallaroo	Osphranter antilopinus	Mammal	kalabah (male), karndayh (female), karndakidj (male), kolobarr (male)
Arafura Fantail	Rhipidura (Howeavis) dryas	Bird	
Arafura Filesnake	Acrochordus arafurae	Reptile	kedjebe, bekka, nawandak
Arnhem Leaf-Nosed Bat	Hipposideros inornatus	Mammal	warlung (small), mulumbibi (small), buma buma (big), kuluban (big)
Arnhem Long-Eared Bat	Nyctophilus arnhemensis	Mammal	warlung (small), mulumbibi (small), buma buma (big), kuluban (big)
Arnhem Rock-Rat	Zyzomys maini	Mammal	mullbu, djirrkinj, bob, kidjikidjidaykdayk, birng
Arnhemland Watercourse Dtella	Gehyra pamela	Reptile	belerrk, moloborndok
Australasian Darter	Anhinga melanogaster novaehollandiae	Bird	kardabaybay, djingarrarr, mandjangarli, kunbad karrulubun
Australasian Figbird	Sphecotheres vieilloti	Bird	
Australasian Harrier	Circus approximans	Bird	
Australasian Pipit	Anthus novaesselandiae	Bird	

Common name	Scientific name	Taxa	Other names
Australian Bustard	Ardeotis australis	Bird	benok, benuk
Australian Hobby	Falco (Falco) longipennis	Bird	
Australian Little Grebe	Tachybaptus novaehollandiae	Bird	
Australian Owlet- Nightjar	Aegotheles crisatus	Bird	lablab, djik
Australian Pelican	Pelecanus conspicillatus	Bird	makkakkurr, werne
Australian Pratincole	Stiltia isabella	Bird	
Australian White Ibis	Threskiornis moluccus	Bird	
Australian White- Winged Triller	Lalage (Lalage) tricolor	Bird	
Azure Kingfisher	Ceyx azureus	Bird	djirrihdiddid

## Resources

## Warddeken guides

Warddeken Land Management – How to set up a camera trap for biodiversity monitoring projects https://healthycountryai.org/files/ WarddekenCameraTrapSetup.pdf

Warddeken Land Management – How to set up a CPW database using EcoAssist https://healthycountryai.org/files/ WarddekenCPWDBSetup.pdf

## **Timelapse**

Timelapse website saul.cpsc.ucalgary.ca/timelapse/

## **Timelapse guides**

Quick Start Guide saul.cpsc.ucalgary.ca/timelapse/uploads/Guides/ TimelapseQuickStartGuide.pdf

#### **Reference Guide**

saul.cpsc.ucalgary.ca/timelapse/uploads/Guides/ TimelapseReferenceGuide.pdf

#### Database Guide

saul.cpsc.ucalgary.ca/timelapse/uploads/Guides/ TimelapseDatabaseGuide.pdf

#### **EcoAssist and Megadetector information**

EcoAssist addaxdatascience.com/ecoassist/

#### EcoAssist GitHub repo

github.com/PetervanLunteren/ EcoAssist?tab=readme-ov-file#windowsinstallation

#### How do I get started with Megadetector?

wildlabs.net/event/how-do-i-get-startedmegadetector

## Video tutorial

#### Quick Start Guide

https://saul.cpsc.ucalgary.ca/timelapse/uploads/ Videos/Video-TimelapseQuickStartGuide.mp4













