



Camera Traps



Why use camera traps?

- ▶ Species presence/absence
 - ▶ Community composition
 - ▶ Species richness or diversity
 - ▶ Threatened & Endangered species



Why use camera traps?

- ▶ Habitat changes
- ▶ Vegetation changes



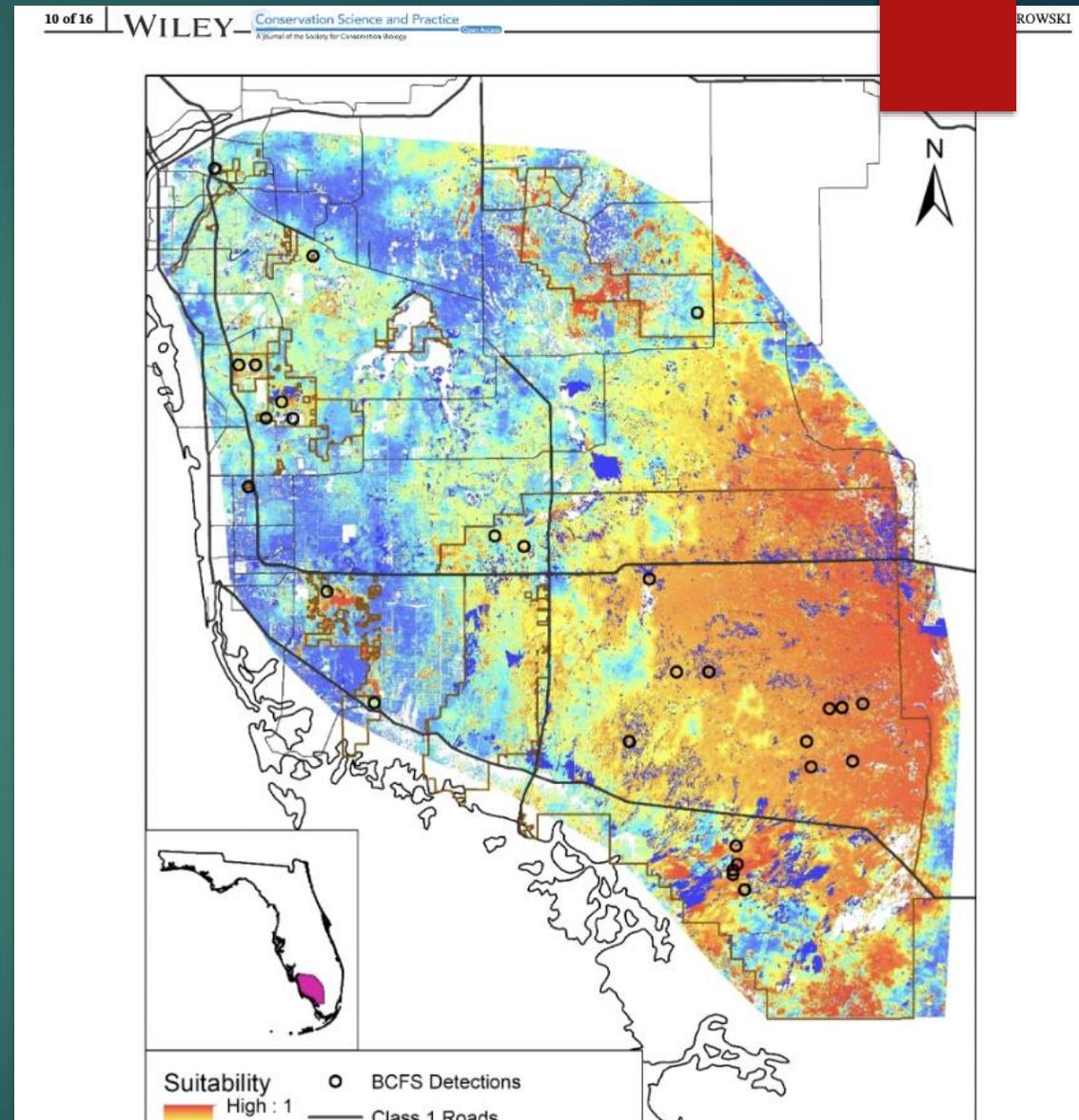
Why use camera traps?

- ▶ Habitat changes
 - ▶ Vegetation changes
 - ▶ Changes in water levels



Uses in Conservation

- ▶ Species Distribution Models
 - ▶ Species movement
 - ▶ Habitat availability/suitability
 - ▶ Habitat connectivity
 - ▶ Future predictions for species in peril
- ▶ Habitat changes
 - ▶ Land-use change
 - ▶ Climate change



Uses in Conservation

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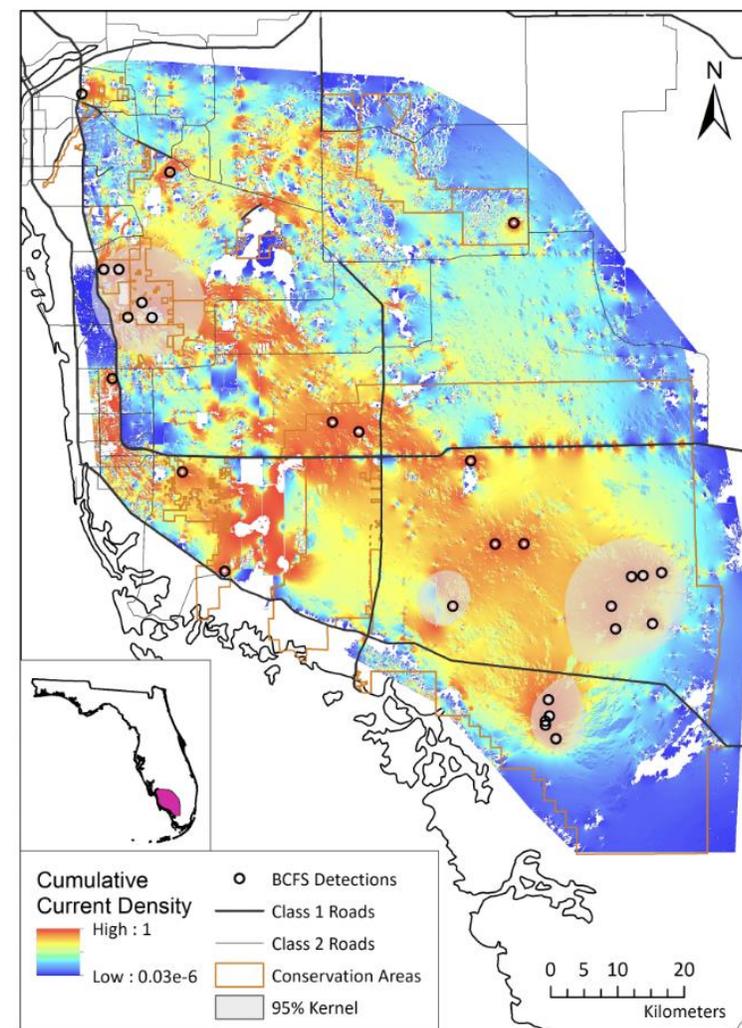


FIGURE 5 Habitat connectivity map for an occupancy study of Big Cypress fox squirrels (*Sciurus niger avicennia*: BCFS) within conservation areas in southwest Florida, 2017–2019. Cumulative current density derived from circuit theory shows likely movement corridors and pinch points due to barriers to movement. Resistance values used to calculate current flow were derived from a 30-m resolution background layer that included tree canopy cover, summer land surface temperature, distance to isolated freshwater wetlands, and distance to high density residential development. Impervious features such as highly trafficked roads, open water, and canals were designated as no net movement probability unless underpasses or manufactured wildlife corridors existed

Benefits

- ▶ Non-invasive
 - ▶ No animal handling necessary
 - ▶ Reduces potential for effects of researcher presence
- ▶ Budget friendly
- ▶ High data output
 - ▶ Community data
 - ▶ Behavioral data
 - ▶ Seasonal data
- ▶ Low labor



Trade-offs

- ▶ Difficult or unable to identify individuals (depending on species)
 - ▶ Abundance estimates unreliable
 - ▶ Limited ability to track individual behavior, survival, & reproduction
- ▶ Liable to damage/theft



Camera Trap Types

- ▶ Continuous recording
 - ▶ Animal behavior
 - ▶ Animals in open spaces
 - ▶ More storage & higher battery and/or more frequent checking
- ▶ Triggered
 - ▶ Active trigger
 - ▶ Trip wire, pressure plate
 - ▶ Passive Trigger
 - ▶ Heat in motion (may not work for herps!)
 - ▶ Can run on batteries with minimal storage for longer depending on settings
 - ▶ Solar power
 - ▶ External battery

Camera Settings

- ▶ Cam/Video
- ▶ Interval
- ▶ # of photos
- ▶ Pixel size
- ▶ Video size and length
- ▶ Sensor Sensitivity



Considerations during placement

- ▶ Viewshed
 - ▶ Target height
 - ▶ Exposure
- ▶ False triggers
 - ▶ Vegetation
 - ▶ Sunlight
 - ▶ Shadows
- ▶ Proximity to trails & roads
 - ▶ Triggers as people/vehicles walk past
 - ▶ People touching/moving camera
 - ▶ Damage & Theft



98F 37C



05-01-2022

TimeLapse Training

Image Analysis Software

- ▶ Need a way to easily sort through photos & assign species to a file
- ▶ TimeLapse
 - ▶ Free
 - ▶ Intuitive
 - ▶ Flexible
 - ▶ CSV output
 - ▶ Only works with windows
- ▶ Other windows options available, some will calculate simple reports for you
- ▶ Don't know of any mac options

Data entry for All files

File RelativePath DateTime Folder ImageQuality Delete? CamSetup

species1 species1count species2 species2count Water ATV/OHV Mange Flag Outreach

Note

Copy previous values
← C →

Instructions Image set Data Table

Navigation icons: back, forward, search, etc.



Data entry for All files

File EK000023.JPG RelativePath DateTime 06-Nov-2021 23:45:57 Folder 10.25.21.nw2.p54 ImageQuality Ok Delete? CamSetup

species1 Lepus califor species1count 1 species2 Water ATV/OHV Mange Flag Outreach

Copy previous values

- Note
- Haemorrhous mexicanus
 - Heloderma suspectum
 - Homo sapien
 - Lampropeltis splendida
 - Leiothlypis luciae
 - Lepus alleni
 - Lepus californicus
 - Lynx rufus
 - Mareca americana
 - Masticophis flagellum
 - Melanperpes uropygialis
 - Melospiza melodia
 - Melozone aberti
 - Mephitis macroura
 - Mephitis mephitis
 - Mimus polyglottos
 - Myiarchus cinerascens
 - Nacua narica



Bushnell 11-06-2021 23:45:57

Data entry for All files

File RelativePath DateTime Folder ImageQuality Delete? CamSetup

species1 species1count species2 species2count Water ATV/OHV Mange Flag Outreach

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Bushnell

11-06-2021 23:45:57

Data entry for All files

File RelativePath DateTime Folder ImageQuality Delete? CamSetup

species1 species1count species2 species2count Water ATV/OHV Mangle Flag Outreach

Note

Copy previous values
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Instructions Image set Data Table



Bushnell 01-04-2022 23:41:38

Timelapse Template Editor (25Jan_UA_WildlifeTemplate.tdb)

File View Help

- New template...
- Open template...
- Recent templates
- Convert old-style template...
- Close
- Exit

Label	Data Label	Tooltip	Width	Copyable	Visible	List		
File	File	The file name	100	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
RelativePath	RelativePath	Path from the folder containing the template and image data files to the file	100	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
DateTime	DateTime	Date and time taken (Year-Month-Day Hours:Minutes:Seconds:Milliseconds)	160	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Folder	Folder	Name of the folder originally containing the template and image data files	100	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
ImageQuality	Ok	ImageQuality	ImageQuality	System-determined image quality: Dark if mostly black, otherwise Ok	85	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Define List
DeleteFlag	false	Delete?	DeleteFlag	Mark a file as one to be deleted.	20	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Flag	false	CamSetup	CamSetup	Check this box if camera was triggered due to camera set up or take down	20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
FixedChoice		species1	species1	Choose an item from the menu	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Define List
Counter	0	species1count	species1count	Click the counter button, then click on the image to count the entity. Or just type	30	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
FixedChoice		species2	species2	IF another species is present	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Define List
Counter	0	species2count	species2count	Click the counter button, then click on the image to count the entity. Or just type	30	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Flag	false	Water	Water	Check this box if water is present in the streambed	20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Flag	false	ATV/OHV	OHV	Check this box if a vehicle is present	20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Flag	false	Mange	Mange	Check if this individual displays symptoms of mange (hairless tail or hairless patch)	20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Flag	false	Flag	Flag	Unsure about one or more of these categories? Click here.	20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Flag	false	Outreach	Outreach	Can this be used for public outreach?	20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Note		Note	Note	Write a textual note	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Add:

Count

Choice

Note

Flag

Remove

What the interface will (roughly) look like. Drag and drop these controls (by their labels) to re-arrange their order to your preference



01-22-



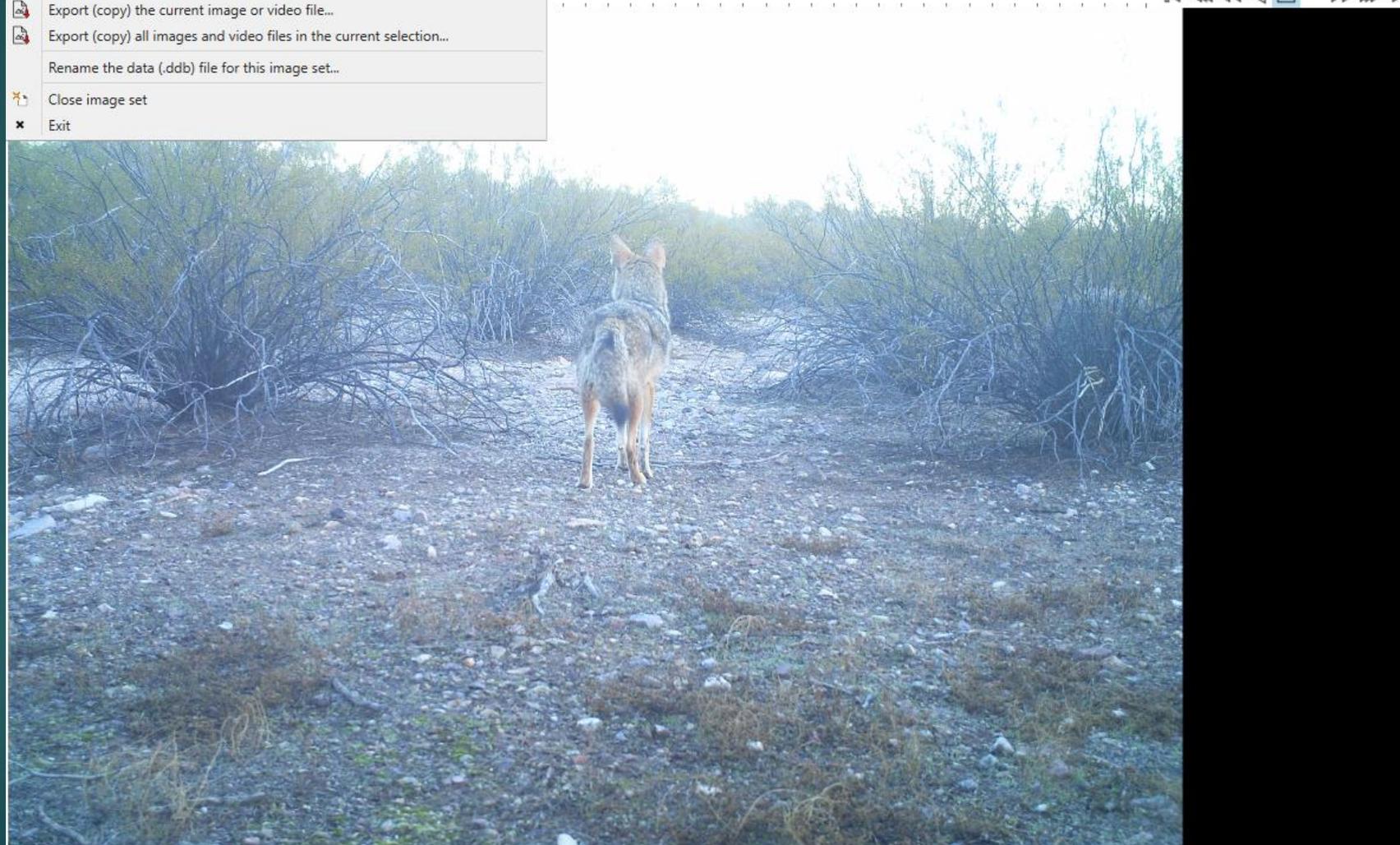
01-22-

- Load template, images, and video files...
- Load a recently used image set
- Add image and video files to this image set...
- 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...
- Import data from a .csv file ...
- Export (copy) the current image or video file...
- Export (copy) all images and video files in the current selection...
- Rename the data (.ddb) file for this image set...
- Close image set
- Exit

022 08:02:53 Folder 10.25.21.rw2.p54 ImageQuality Ok Delete? CamSetup

species2count 0 Water ATV/OHV Mange Flag Outreach

Copy previous values
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File	RelativePath	Folder	Date	Time	ImageQualit	DeleteFlag	CamSetup	species1	species1cour	species2	species2cour	Water	OHV	Mange	Flag	Outreach	Note
EK000001.JPG		06.07.21.rw2	7-Jun-21	8:09:49	Ok	FALSE	TRUE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000002.JPG		06.07.21.rw2	7-Jun-21	8:10:16	Ok	FALSE	TRUE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000003.JPG		06.07.21.rw2	7-Jun-21	8:10:44	Ok	FALSE	TRUE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000004.JPG		06.07.21.rw2	7-Jun-21	8:11:12	Ok	FALSE	TRUE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000005.JPG		06.07.21.rw2	7-Jun-21	8:11:40	Ok	FALSE	TRUE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000006.JPG		06.07.21.rw2	7-Jun-21	8:12:09	Ok	FALSE	TRUE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000007.JPG		06.07.21.rw2	7-Jun-21	8:12:39	Ok	FALSE	TRUE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000008.JPG		06.07.21.rw2	7-Jun-21	8:13:08	Ok	FALSE	TRUE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000009.JPG		06.07.21.rw2	7-Jun-21	8:13:36	Ok	FALSE	TRUE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000010.JPG		06.07.21.rw2	7-Jun-21	8:14:14	Ok	FALSE	TRUE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000011.JPG		06.07.21.rw2	7-Jun-21	8:14:43	Ok	FALSE	TRUE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000012.JPG		06.07.21.rw2	8-Jun-21	2:36:14	Ok	FALSE	FALSE	Sylvilagus au	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000013.JPG		06.07.21.rw2	9-Jun-21	0:17:21	Ok	FALSE	FALSE	Sylvilagus au	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000014.JPG		06.07.21.rw2	9-Jun-21	20:19:04	Ok	FALSE	FALSE	Lepus califor	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000015.JPG		06.07.21.rw2	9-Jun-21	20:21:13	Ok	FALSE	FALSE	Lepus califor	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000016.JPG		06.07.21.rw2	9-Jun-21	20:27:15	Ok	FALSE	FALSE	Lepus califor	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000017.JPG		06.07.21.rw2	9-Jun-21	22:42:33	Ok	FALSE	FALSE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000018.JPG		06.07.21.rw2	10-Jun-21	0:25:51	Ok	FALSE	FALSE	Sylvilagus au	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000019.JPG		06.07.21.rw2	12-Jun-21	4:33:28	Ok	FALSE	FALSE	Lepus califor	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000020.JPG		06.07.21.rw2	14-Jun-21	2:04:56	Ok	FALSE	FALSE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000021.JPG		06.07.21.rw2	15-Jun-21	3:00:58	Ok	FALSE	FALSE	Sylvilagus au	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000022.JPG		06.07.21.rw2	15-Jun-21	23:43:30	Ok	FALSE	FALSE	Canis latrans	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000023.JPG		06.07.21.rw2	16-Jun-21	8:32:31	Ok	FALSE	FALSE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000024.JPG		06.07.21.rw2	17-Jun-21	14:34:33	Ok	FALSE	FALSE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000025.JPG		06.07.21.rw2	18-Jun-21	0:19:18	Ok	FALSE	FALSE	Sylvilagus au	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000026.JPG		06.07.21.rw2	18-Jun-21	0:27:18	Ok	FALSE	FALSE	Unknown	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000027.JPG		06.07.21.rw2	18-Jun-21	2:45:37	Ok	FALSE	FALSE	Sylvilagus au	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000028.JPG		06.07.21.rw2	18-Jun-21	3:13:42	Ok	FALSE	FALSE	Lepus califor	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000029.JPG		06.07.21.rw2	18-Jun-21	3:49:25	Ok	FALSE	FALSE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000030.JPG		06.07.21.rw2	18-Jun-21	3:52:49	Ok	FALSE	FALSE	Sylvilagus au	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000031.JPG		06.07.21.rw2	18-Jun-21	6:44:16	Ok	FALSE	FALSE	Lepus califor	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000032.JPG		06.07.21.rw2	18-Jun-21	9:50:55	Ok	FALSE	FALSE		0		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000033.JPG		06.07.21.rw2	19-Jun-21	2:50:49	Ok	FALSE	FALSE	Canis latrans	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	
EK000034.JPG		06.07.21.rw2	19-Jun-21	22:08:22	Ok	FALSE	FALSE	Canis latrans	1		0	FALSE	FALSE	FALSE	FALSE	FALSE	