

Camera Trap Project Manual

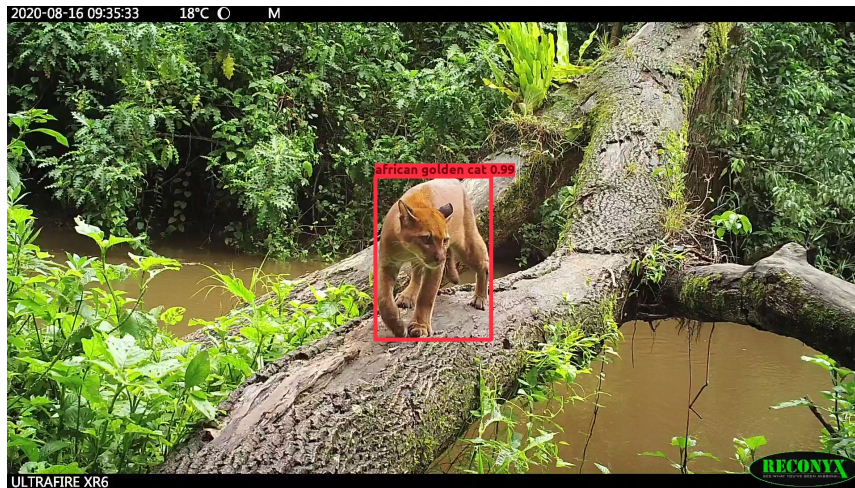
Wildlife Monitoring in African Tropical Forests with DeepForestVision

Field deployment, data management, and offline AI-assisted labelling using DeepForestVision¹ and AddaxAI²

Organizations: OneForestVision initiative, Muséum National d'Histoire Naturelle

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Golden cat detection. ©SCP

This manual provides practical guidance for camera trapping in African tropical forests, including AI-assisted labelling using DeepForestVision. It compiles best practices and field-tested tips from real-world projects to help users design protocols and streamline data processing. DeepForestVision is developed as part of the *OneForestVision initiative*³, which supports tropical countries in protecting forests and wetlands by enabling transparent monitoring of forest degradation, carbon stocks, and biodiversity.

¹DeepForestVision article (BES Journals): [10.1002/2688-8319.70167](https://doi.org/10.1002/2688-8319.70167)

²AddaxAI article (JOSS): [10.21105/joss.05581](https://doi.org/10.21105/joss.05581)

³<https://www.oneforestvision.org>

Contents

Quick-start: one-page checklist	2
1 Scope and objectives	3
2 Project design essentials	3
2.1 Project goals	3
2.2 Camera traps: equipment and configuration	3
3 Camera trap placement in tropical forests	4
3.1 Spot choice	4
3.2 Height and targeting	4
3.3 Theft and damage mitigation	4
3.4 Vegetation and obstacles	4
3.5 GPS and station documentation	4
4 Field operations: maintenance and data collection	4
4.1 Visit frequency	4
4.2 Batteries and SD cards	5
4.3 Team organisation	5
4.4 On-site verification	5
4.5 Lock and key management	5
5 Data management workflow – at camp	5
5.1 Copying and backups	5
5.2 Recommended folder structure	5
5.3 Performance monitoring	6
5.4 Inventory	6
6 Using DeepForestVision with AddaxAI	6
6.1 Installation (first time)	6
6.2 Running DeepForestVision	6
6.3 Recommended quality control (QC) practices	8
7 Standardised label taxonomy (DeepForestVision classes)	8
8 From predictions to ecology: downstream use cases	9
9 Templates	10
9.1 Camera trap station sheet (field form)	10
9.2 Visit log (per camera)	10
9.3 Inventory	10
Quality Control decision tree	11

Quick-start: one-page checklist

Checklist

Use this page to deploy a new site or restart after a break. Print it and bring it to camp.

A. Before leaving camp

- ☐ CTs labelled with unique IDs (e.g., CT001)
- ☐ Correct date/time set (document timezone)
- ☐ Batteries installed + spare sets packed
- ☐ SD cards: separate cases for **READY** (formatted, empty, *unlocked*) vs **TO COPY** (collected, *locked*)
- ☐ Mounting kit (straps/cables), tools, tape
- ☐ Locks/metal cases + keys (numbered) + camouflage tape
- ☐ GPS/phone with offline maps; field forms
- ☐ Optional: laptop for on-site checks (if CT has no screen)

B. At each camera station

- ☐ Choose station location according to protocol, using local knowledge
- ☐ Record GPS point + station notes (habitat, trail, human signs)
- ☐ Choose height: ground / mid / canopy depending on target taxa
- ☐ Orient to avoid sun glare; ensure stable background in detection zone
- ☐ Clear vegetation in field-of-view; **do not damage the environment**
- ☐ Avoid close obstacles that reflect IR at night
- ☐ Run walk-test / trigger test and verify angle
- ☐ Install lock/case (if needed)
- ☐ Camouflage and ensure the station looks discreet

C. Routine maintenance

- ☐ Visit schedule planned (weekly ideal; monthly minimum if remote)
- ☐ Swap SD + batteries as needed (lock the freshly collected SD and store it as **TO COPY**)
- ☐ Log clip counts, clips of special interest, and blank rate to detect issues early
- ☐ Re-trim vegetation minimally and within rules; check for new obstructions
- ☐ Remove dirt and insects using a pencil brush; clean lenses
- ☐ Bring faulty devices back to camp for drying/updates/repairs

D. Daily/weekly data pipeline

- ☐ Copy SD → main external drive (organised folder structure)
- ☐ Verify copy (file counts, random checks)
- ☐ Second copy to another drive; optional cloud sync if internet is available
- ☐ Return SD cards to **READY** only after backups are verified
- ☐ Run DeepForestVision in AddaxAI
- ☐ Review low-confidence predictions and priority species first
- ☐ Sort clips of interest: poachers, crop-feeding species at agricultural interfaces, injured/snared animals, ...

1 Scope and objectives

This manual supports teams running camera trap (CT) projects in African tropical forests, from field deployment to data handling and AI-assisted labelling. It focuses on:

1. Setting up camera traps and managing data collection.
2. Using the DeepForestVision identification model in the offline AddaxAI interface for (semi-) automated labelling.

Important

This manual does not replace local regulations, permitting, or safety protocols. Always comply with site rules, protected-area regulations, and ethical guidance for wildlife research.

2 Project design essentials

2.1 Project goals

Before deploying, decide:

- **Target taxa/behaviours:** chimpanzees collecting honey, geophagy sites, ...
- **Key outputs:** biodiversity inventory, occupancy/presence-absence, activity patterns, behaviour sampling, density estimation (only when design supports it).
- **Sampling protocol/design:** grid/stratified (robust biodiversity monitoring) vs opportunistic (rare behaviours), photographs or videos, camera trap settings.
- **Constraints:** theft/animal damage risk, accessibility, rainy season, team size, budget.

Field tip

A hybrid approach works well: core standardized design + flexible subset for focal behaviours.

2.2 Camera traps: equipment and configuration

Depending on your project resources and goals, consider:

- **Durability:** humidity resistance, seals, latch quality.
- **Power system:** battery system, battery life in humidity/heat, solar panels.
- **Ease of setup:** screen and walk-test mode.
- **Night performance:** IR illumination, motion sensitivity, recovery time.
- **Video/photo resolution:** high resolution increases file size but often improves AI and human identification — 1080p is advised when possible.
- **Cost:** balance against the risk of theft and damage.

Environment-friendly tip

Camera traps with solar panels and rechargeable batteries reduce environmental footprint.

Important

Plan storage and backups before deployment. High resolution can overwhelm SD stock, copy times, and compute time.

3 Camera trap placement in tropical forests

3.1 Spot choice

Within the constraints of your protocol, look for signs of animal activity (tracks, dung, trails) and select attractive spots for target species (e.g., water points, salt/mineral licks, geophagy sites).

3.2 Height and targeting

- **Ground-level:** terrestrial mammals and ground birds.
- **Mid-height:** large mammals and reduced small-animal false triggers.
- **Canopy:** arboreal mammals (requires specialised mounting and safety).

3.3 Theft and damage mitigation

Balance open views with discreet placement. Consider metal cases with padlocks and camouflage tape. During high-risk periods, increase visit frequency and prioritise discreet installations.

3.4 Vegetation and obstacles

- Avoid branches/leaves close to the lens (wind → overtriggering).
- Close obstacles may reflect IR and appear white at night, making clips unusable.
- Re-check vegetation regularly; trim minimally and legally.

3.5 GPS and station documentation

Record CT ID, GPS point, height, orientation, settings, and notes.

Checklist

- ☐ CT ID labelled on device and in datasheet
- ☐ GPS coordinates recorded
- ☐ Height and orientation recorded
- ☐ Walk-test / trigger test completed
- ☐ Vegetation cleared from detection zone
- ☐ Lock/case installed (if used)

4 Field operations: maintenance and data collection

4.1 Visit frequency

Weekly visits are best to catch failures and damage early, clean cameras, trim vegetation, and remove new obstacles; monthly visits are possible but riskier.

4.2 Batteries and SD cards

- Swap batteries and SDs weekly/monthly depending on activity and settings.
- Lock the SD card you just collected and store it as **TO COPY** to prevent accidental formatting.
- Track battery use: with 8–12 batteries per device, consumption grows quickly.
- Avoid mixing batteries of different brands or ages.

Important

Adopt a strict SD rule: collected cards are locked and go into a labelled **TO COPY** case immediately; cleared cards are stored separately as **READY**.

4.3 Team organisation

Work in pairs to reduce safety risks (health incidents, wildlife encounters, poachers). Maintain a schedule with buffers for rain, blocked paths, staff absences, and other unforeseen events.

4.4 On-site verification

If CTs lack a screen, consider a laptop to check on-site and avoid discovering failures only at camp.

4.5 Lock and key management

If using padlocks, number keys with stickers and keep a key register (Key # → Lock # → CT ID).

5 Data management workflow – at camp

5.1 Copying and backups

At camp:

- Copy SD → main drive (organised by site/CT/batch).
- Make a second copy to another drive.
- Optional online copy if internet is available, for safety and same-day access elsewhere.

5.2 Recommended folder structure

```
PROJECT/  
  00_ADMIN/  
  01_FIELD_LOGS/  
  02_DATA/  
    SITE_A/CT001/  
    SITE_A/CT002/  
    SITE_B/CT010/  
  03_PROCESSED/  
    DFV_OUTPUTS/  
  04_QUALITY_CONTROL/  
  05_ANALYSIS/  
  06_ARCHIVE/
```

Each camera folder can further be divided into weekly/monthly subfolders, depending on data collection rate.

5.3 Performance monitoring

Track recorded clips/day, blank rate, and failures. Adjust camera placement or settings when needed, relocate underperforming cameras, and bring back to camp cameras that need repairing.

5.4 Inventory

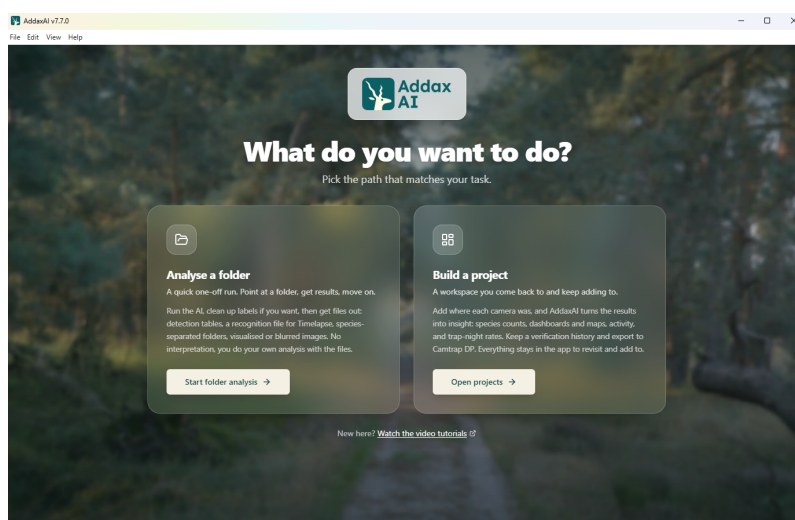
Keep a live inventory for devices, SD cards (**READY/TO COPY**), and batteries (charged/used/defective) — see template 9.3.

6 Using DeepForestVision with AddaxAI

AddaxAI provides a **free, user-friendly offline interface** for using DeepForestVision to automatically classify camera trap photos and videos. **All files are processed locally**: after the initial installation, no internet connection is required, and your data never leaves your machine. No programming knowledge is required.

6.1 Installation (first time)

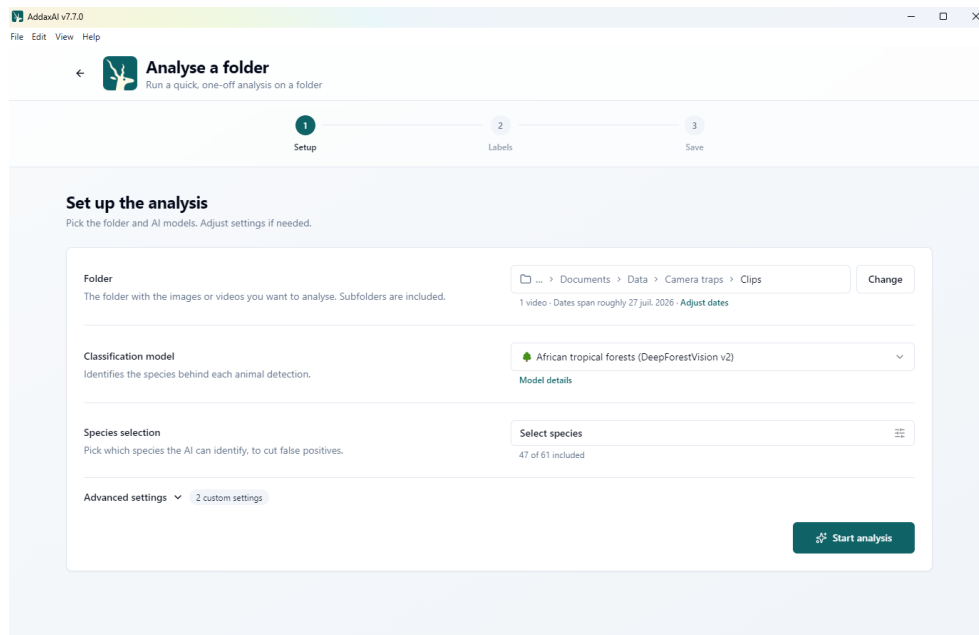
Download the AddaxAI installer for your operating system (Windows/macOS/Linux) from the official website <https://addaxdatascience.com/addaxai/>. Installation can be slow, plan for several GB of free space and a stable connection. If problems occur, confirm firewall/endpoint protection is not blocking installation (follow your organisation's IT rules).



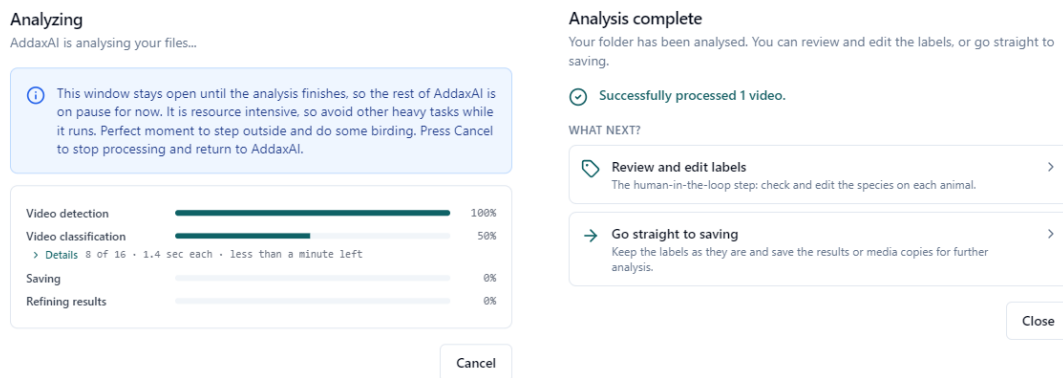
AddaxAI start screen after installation.

6.2 Running DeepForestVision

1. Choose **Start folder analysis** and select the folder containing your batch of data (photographs and/or videos). Data in subfolders will also be processed.
2. Select the classification model **African tropical forests (DeepForestVision)**. Model versions are labeled v1, v2, etc.; select the latest available version.
3. (Optional) Uncheck species that are definitely absent from your study zone.
4. Click **Start analysis**.
5. Once the analysis is finished, click **Go straight to saving**, then click **Save outputs**.



Running DeepForestVision.



Data analysis: running (left) and finished (right).

AddaxAI outputs a results table, `addaxai-files.csv`, which can be opened in Excel or an open-source alternative. **Each row corresponds to one analyzed file** and contains the file name (relative path and absolute path), recording date and time (datetime), predicted taxon (classification label; empty if no detections were made) and associated taxonomic information, confidence scores (detection confidence and classification confidence), and camera-trap information when available.

relative_path	datetime	observation_type	detection_confidence	classification_label	classification_confidence	taxon_class	taxon_order	taxon_family	taxon_genus	taxon_species	scientific_name
DSCF0001.MP4	2026-07-20T16:40:28+00:00	animal	0.712	squirrel	0.87097	mammalia	rodentia	sciuridae			Sciuridae
DSCF0002.MP4	2026-07-21T11:20:34+00:00	animal	0.936								Animal
DSCF0003.MP4	2026-07-21T17:08:16+00:00	blank									
DSCF0004.MP4	2026-07-23T03:23:38+00:00	animal	0.556	rodent	0.94013	mammalia	rodentia				Rodentia
DSCF0005.MP4	2026-07-26T15:48:33+00:00	animal	0.903	chimpanzee	0.89248	mammalia	primates	hominidae	pan	troglodytes	P. troglodytes
DSCF0006.MP4	2026-07-26T15:49:09+00:00	animal	0.884	chimpanzee	0.88589	mammalia	primates	hominidae	pan	troglodytes	P. troglodytes
DSCF0007.MP4	2026-07-27T05:31:49+00:00	animal	0.595	squirrel	0.72813	mammalia	rodentia	sciuridae			Sciuridae
DSCF0008.MP4	2026-07-27T10:56:54+00:00	person	0.967								Person

Output table with classification labels and confidence scores.

AddaxAI also outputs `addaxai-detections.csv` and `addaxai-summary.csv`, which contain information about each detection and a count of detections per classification label, respectively.

Important

By default, AddaxAI applies a taxonomic rollup, assigning uncertain classifications to a higher taxonomic level. To disable this behavior, once the analysis is complete, click **Review and edit labels**, then **Refine results**. Disable **Taxonomic rollup** and click **Apply and reprocess**. This is a quick post-processing step and does not rerun DeepForestVision. Once complete, you can save the outputs.

6.3 Recommended quality control (QC) practices

To keep labels reliable for ecology, quality control checks of DeepForestVision outputs are needed:

- Prioritise review of **low-confidence** predictions.
- Manually verify **priority species** (conservation status, focal taxa, legally sensitive taxa).
- Expect more errors in **night clips** (IR illumination, blur, partial bodies).
- Use an **unknown** or higher-rank label (genus/family) when species-level ID is unreliable.

A possible audit strategy for prediction errors is given in the Quality Control decision tree (p. 11).

7 Standardised label taxonomy (DeepForestVision classes)

Map your project's **label dictionary** to DeepForestVision taxonomy to harmonise AI predictions, human QC, and downstream analysis.

Prediction class	Scientific name	Identification level
aardvark	<i>Orycteropus afer</i>	species
african buffalo	<i>Syncerus caffer</i>	species
african golden cat	<i>Caracal aurata</i>	species
baboon	<i>Papio</i> sp.	genus
bird	Aves	class
black-and-white colobus	<i>Colobus</i> sp.	genus
blue duiker	<i>Philantomba</i> sp.	genus
blue monkey	<i>Cercopithecus mitis</i>	species
bushbuck	<i>Tragelaphus scriptus</i>	species
bushpig	Suidae	family
chimpanzee	<i>Pan troglodytes</i>	species
civet_genet	Nandiniidae_Viverridae	family
elephant	<i>Loxodonta</i> sp.	genus
galago_potto	Lorisiformes	infraorder
gorilla	<i>Gorilla</i> sp.	genus
guineafowl	Numididae	family
honey badger	<i>Mellivora capensis</i>	species
hyrax	Procaviidae	family
side-striped jackal	<i>Canis adustus</i>	species
leopard	<i>Panthera pardus</i>	species
l'hoest's monkey	<i>Allocebus lhoesti</i>	species

Prediction class	Scientific name	Identification level
mandrill	<i>Mandrillus sphinx</i>	species
mongoose	Herpestidae	family
monkey	Cercopithecidae	family
pangolin	Manidae	family
porcupine	Hystriidae	family
red colobus_red-capped mangabey	<i>Piliocolobus</i> sp. / <i>Cercocebus torquatus</i> sp.	genus
red duiker	<i>Cephalophus</i> sp.	genus
rodent	Rodentia	order
serval	<i>Leptailurus serval</i>	species
spotted hyena	<i>Crocuta crocuta</i>	species
squirrel	Sciuridae, Anomaluridae	family
water chevrotain	<i>Hyemoschus aquaticus</i>	species

8 From predictions to ecology: downstream use cases

Common applications include:

- **Removing blanks:** reduce manual workload by excluding empty clips.
- **Pre-sorting:** watch only clips of interest (e.g., elephant behaviour).
- **Presence/absence:** detection histories by site and time period.
- **Density estimation:** only when sampling design and assumptions support it.
- **Biodiversity richness:** number of detected taxa (mind detection bias and misclassification).

Important

AI outputs are labels with uncertainty. For publishable inference, document QC steps and quantify error where possible (e.g., validation subsets, confusion notes, inter-reviewer checks).

What's next?

- ➡ **Model updates:** DeepForestVision will be expanded with additional taxa and made available through AddaxAI releases.
- ➡ **Help us improve:** Share feedback and examples of misclassifications or missing taxa (ideally with a small labelled subset and brief site/context notes).
- ➡ **Contact:** hugo.magaldi@mnhn.fr / sabrina.krief@mnhn.fr 😊

9 Templates

9.1 Camera trap station sheet (field form)

Field	Value
CT ID	
Site / Grid cell	
GPS (lat/long)	
Date/time installed	
Installer initials	
Height (cm)	
Orientation (bearing)	
Habitat notes	
Settings (photo/video, burst, length, interval)	
Lock/case ID	
SD card ID installed	
Battery set ID installed	
Walk-test OK (Y/N)	
Notes (theft risk / obstacles)	

9.2 Visit log (per camera)

Date	CT ID	SD out / in	Batteries out / in	Clips since last	Issues

9.3 Inventory

Item	Quantity	Status	Notes
Camera traps		Active / Spare / Repair	
SD cards		READY / TO COPY	
Batteries		Charged / Used	
Locks / cases		Deployed / Stock	

Quality Control decision tree

