1STOPBORNEO WILDLIFE

DISCOVER THE HIDDEN WORLD OF WILDLIFE THROUGH THE LENS OF A DSLR CAMERA TRAP

where every click unlocks the secrets of the forest, guiding you on a thrilling adventure of discovery.

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Contributors

Tijmen Alexander de Lorm

- PhD researcher at Imperial College London
- Main Contributor & DSLR Camera Trap Specialist
- Designed and set up all DSLR camera trap systems
- Ensured optimal placement for maximum wildlife detection

Yulinda Wahyuni

- Senior Officer, 1StopBorneo Wildlife
- Provided logistical and organizational support
- Facilitated permits and collaborations with local authorities
- Assisted in data collection and species identification

Ledumin Duraman

- Wildlife guide and forest expert
- Used his deep knowledge of the forest terrain and animal behaviours to select ideal camera locations
- Provides physical assistants on equipment transportation.
- Does regular checks on the status of placed camera traps.

Read more at www.1stopborneo.org

1StopBorneo Wildlife

INTRODUCTION

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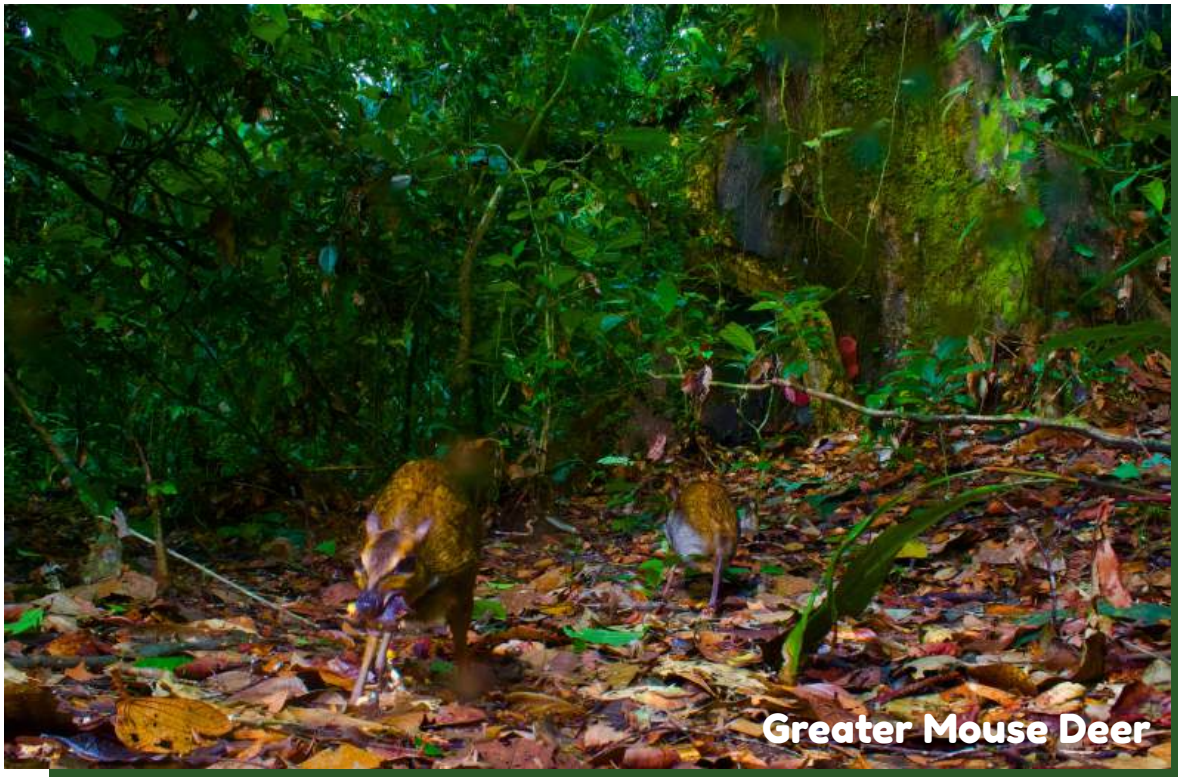
Wildlife monitoring has been transformed by camera traps, which offers priceless insights into biodiversity, population dynamics, and animal behavior. Three important sites in Sabah are Tawau Hills Park, Deramakot Forest Reserve, and Beluran Safaris (Deramakot Landscape) which are highlighted in this paper for the usage of DSLR camera traps. Tijmen Alexander De Lorm led the initiative, with vital assistance from Yulinda Wahyuni, Senior Officer, 1StopBorneo Wildlife, and Ledumin Duraman, a former poacher who is now a tour guide and wildlife protector.


Sun Bear

Their combined knowledge made it possible to set up top-notch DSLR camera traps successfully, producing breathtaking photos of Borneo's secretive animals.


Greater Mouse Deer

The Secret Weapon for Stunning Wildlife Shots

A silent watcher has been filming the secret lives of wildlife with astonishing clarity in deep forests and distant wilderness locations where humans rarely explore. This is the DSLR camera trap. Unlike conventional trail cameras, which frequently create grainy, low resolution images, DSLR based systems offer museum quality photographs, allowing researchers to identify individual animals, analyze fine scale habits, and even contribute to conservation efforts.

How does a DSLR camera trap work? What are its advantages over off-the-shelf trail cameras? And what challenges do researchers face when deploying these systems in the field? This article explores the design, deployment, and real-world performance of DSLR camera traps, drawing from a recent field test in Tawau Hills Park.

Why Use a DSLR for Camera Trapping?

Most wildlife researchers use infrared trail cameras, which are small, weatherproof, and energy efficient. However, these gadgets have several limitations:

- Low resolution (<20MP) makes species identification difficult.
- Poor low light performance causes grainy or noisy photos.
- Fixed lenses limit framing options.

A DSLR camera trap solves these problems by combining:

✓ High resolution sensors (24MP+) for detailed images.
✓ Interchangeable lenses (wide-angle, telephoto, macro).
✓ Superior low light capabilities (large apertures, better ISO handling).

Compared to conventional systems, DSLR camera traps tend to be more expensive, heavier, power-hungry and big, almost like hiding a microwave in the forest.

Required Equipment

To ensure high resolution images even in low light conditions, the team used professional grade DSLR setups:

Core Imaging System

- Camera: Canon EOS 1100D (Rebel T3)
- Lens: Canon EF-S 18-55mm f/3.5-5.6 III (Kit lens)
- External Flash: Nikon Speedlight SB-28 (modified for remote triggering)

Trigger & Sensor System

- Motion Sensor: Camtraptions Wireless PIR Motion Sensor (Transmitter II)
- Receiver: 3x Camtraptions Wireless Receiver II
- Cables & Connectors: for linking the sensor to the camera

Power Supply

- Camera Battery: Canon LP-E10 (2 recommended for rotation)
- Flash / Trigger Power: 2x 3xAA battery holders (6 batteries total for each) & 1x 2xAA battery holder (for Receiver II)
- Battery Type: Lithium AA

Housing & Mounting

- Weatherproof Case: Pelican 1200 or equivalent
- Security: Python cable lock or wildlife-proof box
- Mounting: Heavy duty tripod or custom tree bracket

Tools & Accessories

- Drill & hole saw bits (for housing ports)
- Silicone sealant (waterproofing)
- Zip ties and duct tape

Note: Settings may vary by camera model and field conditions. The configurations provided here are based on the models currently used by our team.

Building a DSLR Camera Trap: A Step-by-Step Guide (Pre-Field Preparation)

Note: Settings may vary by camera model and field conditions. The configurations provided here are based on the models currently used by our team.

Step 1: Camera Preparation

1. Set camera to Manual (M) mode with:
   - Aperture: f/5.6-f/8
   - Shutter Speed: 1/200s
   - ISO: 400-800
   - Manual focus at expected animal distance (test with a stick)
2. Disable autofocus and auto power-off.
3. Format memory card (use 32GB+ for multi-day deployments).

Step 2: Flash Configuration

1. Mount SB-28 flash on hotshoe or via bracket.
2. Set to Manual mode, 1/16 or 1/32 power.
3. Connect PC sync cable to flash's "PC" port.

Step 3: Wireless Trigger Setup

1. Transmitter II (PIR Sensor):
   - Install either 2xAA batteries or use the external battery with 6xAA batteries (Lithium recommended).
   - Adjust sensitivity dial (start at mid-range).
   - Test detection range (6-12m ideal).
2. Receiver II:
   - Install 2xAA batteries.
   - Connect to camera via 2.5mm stereo jack (shutter port).
   - Connect to flash via PC sync cable.

Step 4. Power Management

1. Camera: Use fresh LP-E10; carry spares.
2. Flash: Connect to 4xAA battery holder (6V total).
3. Transmitter: Second 4xAA pack for extended use.

Step 5: Weatherproof Housing

1. Drill three holes in Pelican case:
   - 50mm for lens (front-center)
   - 20mm for PIR sensor (front-side)
   - 25mm for flash (top)
2. Seal gaps with silicone. Insert desiccant packs.
3. Secure camera with foam padding.

Step 6: Mounting & Camouflage

1. Mount on tripod or strap to tree at:
   - 30cm height for small mammals
   - 1m height for deer/boars
2. Angle PIR sensor toward animal trails.
3. Camouflage with local vegetation.

Step 7: Dry Run

1. Walk through detection zone to test triggering.
2. Verify:
   - No shutter lag
   - Proper flash illumination
   - No false triggers (adjust PIR sensitivity)
3. Leave for 24h test run before full deployment.

Building a DSLR Camera Trap: A Step-by-Step Guide (Field Setup)

Note: Settings may vary by camera model and field conditions. The configurations provided here are based on the models currently used by our team.

1. Find the Perfect Location

- Look for animal trails (footprint, scat, broken vegetation), natural funnels (logs, rivers, salt licks) and avoid cluttered background (dense bushes).

2. Place a Test Subject

- Place a bottle or stick where you expect animals to pass.
- This helps align the camera / flashes during setup.

3. Set Up the Camera

- Attach the Receiver II to the camera's 2.5mm shutter port.
- Secure the Canon EOS 1100D inside the case with foam padding.
- Set this receiver to Channel IV (different from flashes).
- Point the lens toward the subject through the case's lens port.

4. Position the Primary Flash

- Mount the Nikon SB-28 flash on a tree/bracket 1–2m from the subject.
- Connect it to a Receiver II (set to Channel III).
- Angle the flash to illuminate the subject's front.
- Secure with cable ties and test stability (shake the tree to check).

5. Add Background Flash

- Place a second SB-28 flash on the other side of the camera.
- Connect to another Receiver II (Channel III).
- This backlight reduces shadows (critical for nighttime shots).

6. Sync All Receivers

Ensure:

- Flash receivers are on Channel III.
- Camera receiver is on Channel IV.
- Transmitter II (PIR sensor) is on Channel IV (matches camera receiver).

7. Install the Motion Sensor

- Place the Camtraptions PIR Transmitter II where animals will pass.
- Angle it towards the expected movement path.
- Keep it 5-10m from the camera for best detection.

8. Sync the Camera Receiver & Motion Sensor

- The Receiver II on the camera must be on a different channel (e.g., Channel IV) than the flash receivers.
- The Transmitter II (motion sensor) must match the camera's receiver channel (Channel IV).

9. Final Checks

- Test the system: Walk in front of the sensor - camera should trigger, flashes should fire.

DSLR Camera Trap Locations

Tawau Hills Park

- Location & Area: 279.7 km² of lowland dipterocarp rainforest, 24 km north of Tawau
- Key Features:
- Volcanic terrain: picnic sites, camping areas, hot springs, Table Waterfall
- Well-maintained nature trails through shaded forest
- Mount Lucia:
- Elevation: 1,201 m volcanic cone
- Trail: 14 km circuit; 3-day trek (accommodation at KM 10 hostel; permit & guide required)
- Research Value: Mixed-forest corridors, natural animal-funnel routes and varied understorey provide excellent sites for DSLR camera-trap deployment and wildlife observation.

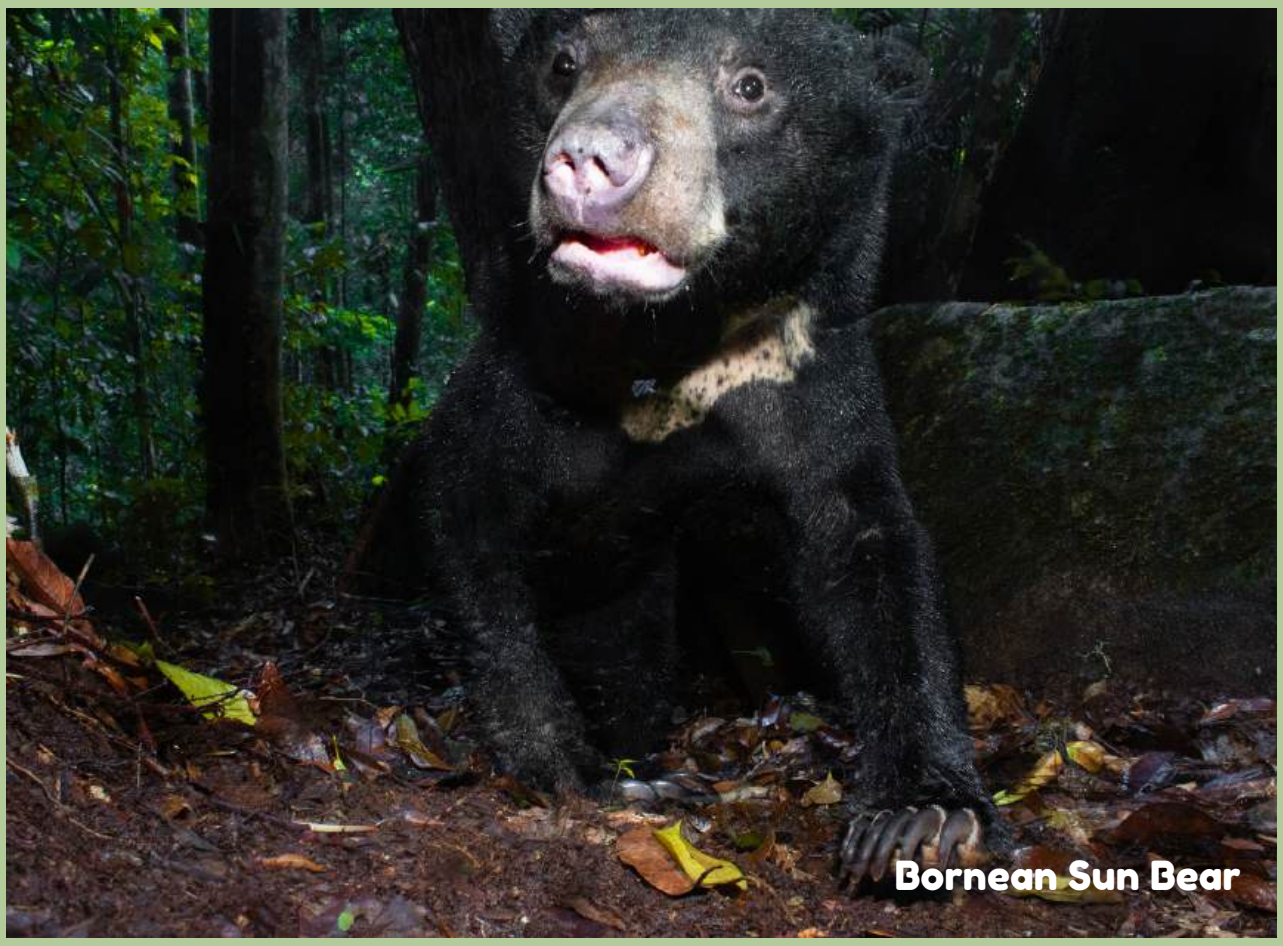
Deramakot Forest Reserve

- Area & Location: ~55 507 ha of lowland mixed dipterocarp rainforest in east-central Sabah
- Access: 4×4 drive (~7 h) from Kota Kinabalu to base camp
- Certification: First tropical rainforest with continuous FSC certification (since 1997; renewed through 2029)
- Management Zones:
- ~51 000 ha for reduced-impact selective logging
- ~4 000 ha strict conservation areas
- Key Fauna: High mammal richness, including Bornean orangutans and Sunda pangolins
- Research Value: Well-managed forest structure and intact wildlife corridors ideal for DSLR camera-trap monitoring

Mount Minodtuhan

- Elevation: 2,360 m above sea level in Kinabalu Park, Sabah
- Trailhead: Sayap Substation ranger outpost
- Distance & Duration: 8.9 km round-trip; 4–5 hours one-way
- Habitat: Mixed dipterocarp to montane forest—ferns, figs, orchids
- Characteristics:
- Well-trodden forest path
- Steep, moss-clad final 2 km (≈ 1,000 m elevation gain)
- Research Value: Clear animal-trail corridors and varied vegetation make it ideal for DSLR camera-trap studies.

Tawau Hills Park



Bornean Sun Bear

Bornean Clouded Leopard

Tawau Hills Park

Southern Pig-tailed Macaque

Greater Mouse Deer

Tawau Hills Park

Malayan Porcupine

Bornean Porcupine

Tawau Hills Park

Short-tailed Mongoose

Yellow-throated Marten

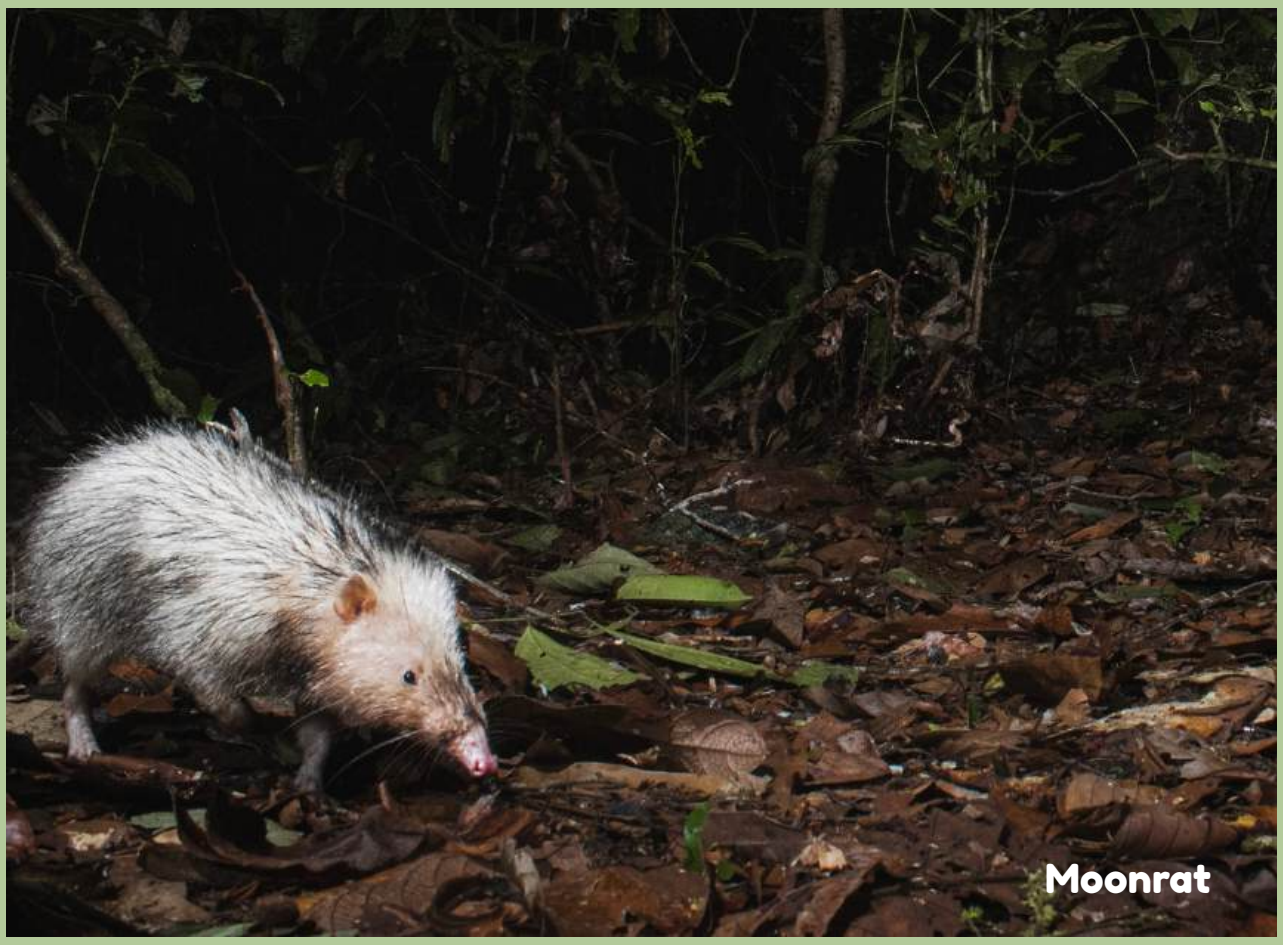
Tawau Hills Park

Masked Palm Civet

Malayan Civet

Tawau Hills Park

Banded Linsang



Moonrat

Mount Minodtuhan

Crimson-headed Partridge

Sabah Giant Rat

Mount Minodtuhan

Bornean Ferret Badger

Hose's Palm Civet

Deramakot