MBZ Raptor Conservation Fund

Sooty Falcon Project

In partnership with the The Peregrine Fund Madagascar Project

صندوق محمد بن زايد للمحافظة على الطيور الجارحة
MOHAMED BIN ZAYED
RAPTOR CONSERVATION FUND

Munir Virani & Andrew Dixon

هيئة البيئة - أبوظبي
Environment Agency - ABU DHABI

THE PEREGRINE FUND

Expedition Overview

- Location: Alley of the Baobabs, near Morondava, western Madagascar.
- Dates: 1–18 March 2025.
- Led by MBZRCF with The Peregrine Fund (Madagascar) and international experts.
- Focus: key wintering and roosting area for Sooty Falcons.

صندوق محمد بن زايد للمحافظة على الطيور الجارحة
MOHAMED BIN ZAYED
RAPTOR CONSERVATION FUND

Main Objectives

- Track Sooty Falcons with satellite transmitters to map migration routes and identify breeding locations.
- Identify important wintering areas within Madagascar and potential mortality hotspots.
- Collect blood samples for future genomic studies.
- Survey other raptors along the Antananarivo–Morondava road corridor.

صندوق محمد بن زايد للمحافظة على الطيور الجارحة
MOHAMED BIN ZAYED
RAPTOR CONSERVATION FUND

Methods – Capturing Falcons

- Elevated mist nets set around baobab trees at roost and foraging sites.
- Nets operated from early morning until late afternoon.
- Captured falcons hooded to reduce stress and handled carefully.
- Biometrics taken (mass, wing, tail, tarsus, etc.).
- Small blood samples collected for genetic analysis.

صندوق محمد بن زايد للمحافظة على الطيور الجارحة
MOHAMED BIN ZAYED
RAPTOR CONSERVATION FUND

Methods – Tagging & Surveys

- Falcons fitted with lightweight 8g satellite transmitters (Hunan Global Messenger).
- Transmitters attached using a backpack-style harness.

صندوق محمد بن زايد للمحافظة على الطيور الجارحة
MOHAMED BIN ZAYED
RAPTOR CONSERVATION FUND

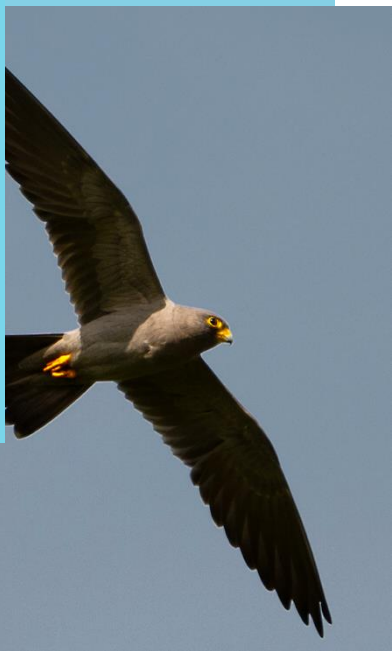
Key Results – Sooty Falcons

- Nine Sooty Falcons successfully captured and tagged.
- Age classes: seven adults, one immature, one first-year bird.
- All individuals measured and sampled for future genomic work.
- Tracking confirms Alley of the Baobabs as a crucial wintering stronghold.

صندوق محمد بن زايد للمحافظة على الطيور الجارحة
MOHAMED BIN ZAYED
RAPTOR CONSERVATION FUND

صندوق محمد بن زايد للمحافظة على الطيور الجارحة
MOHAMED BIN ZAYED
RAPTOR CONSERVATION FUND

574
(imm
570



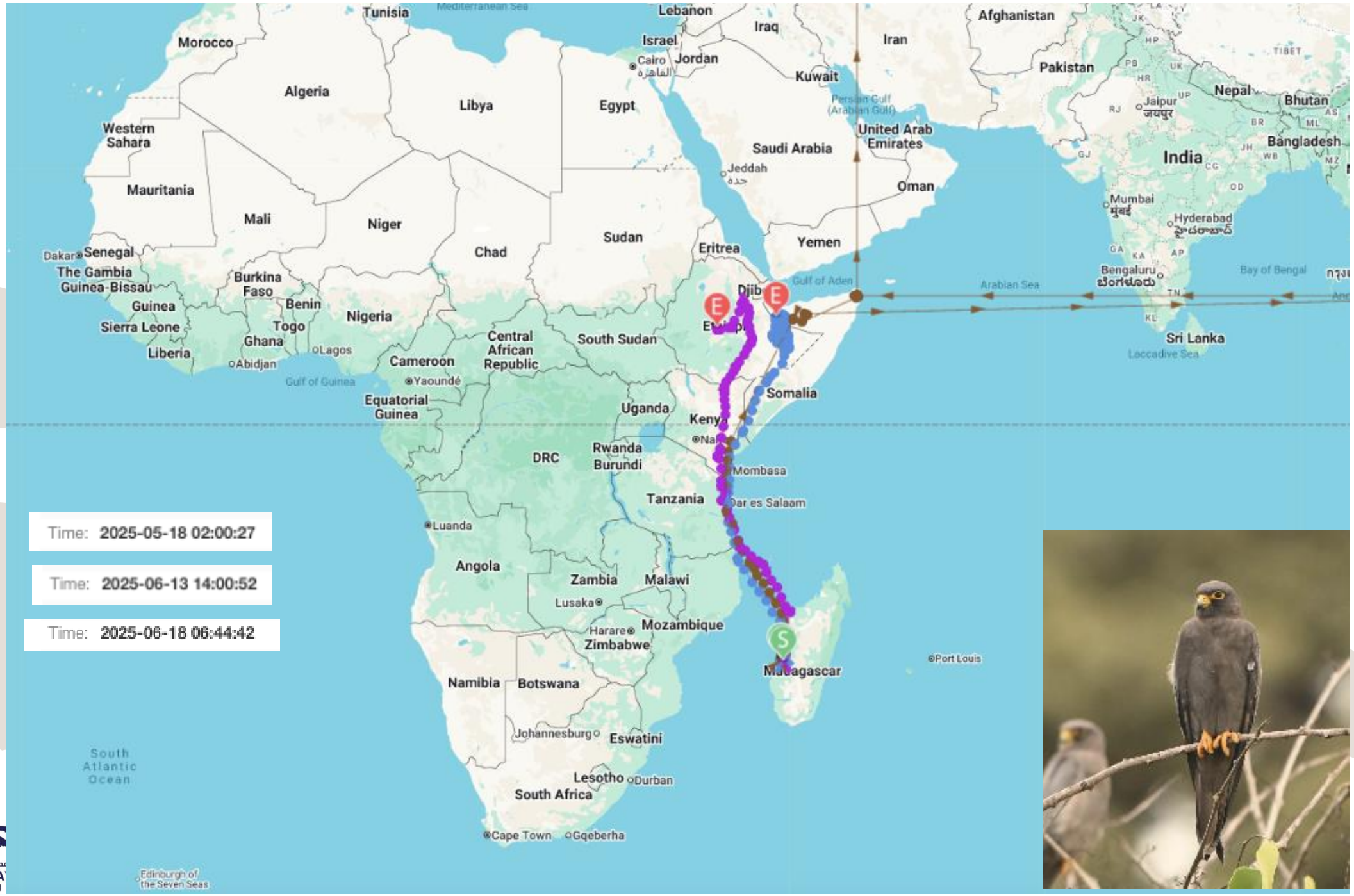
صندوق محمد بن زايد للمحافظة على الطيور الجارحة
MOHAMED BIN ZAYED
RAPTOR CONSERVATION FUND

573
576
575

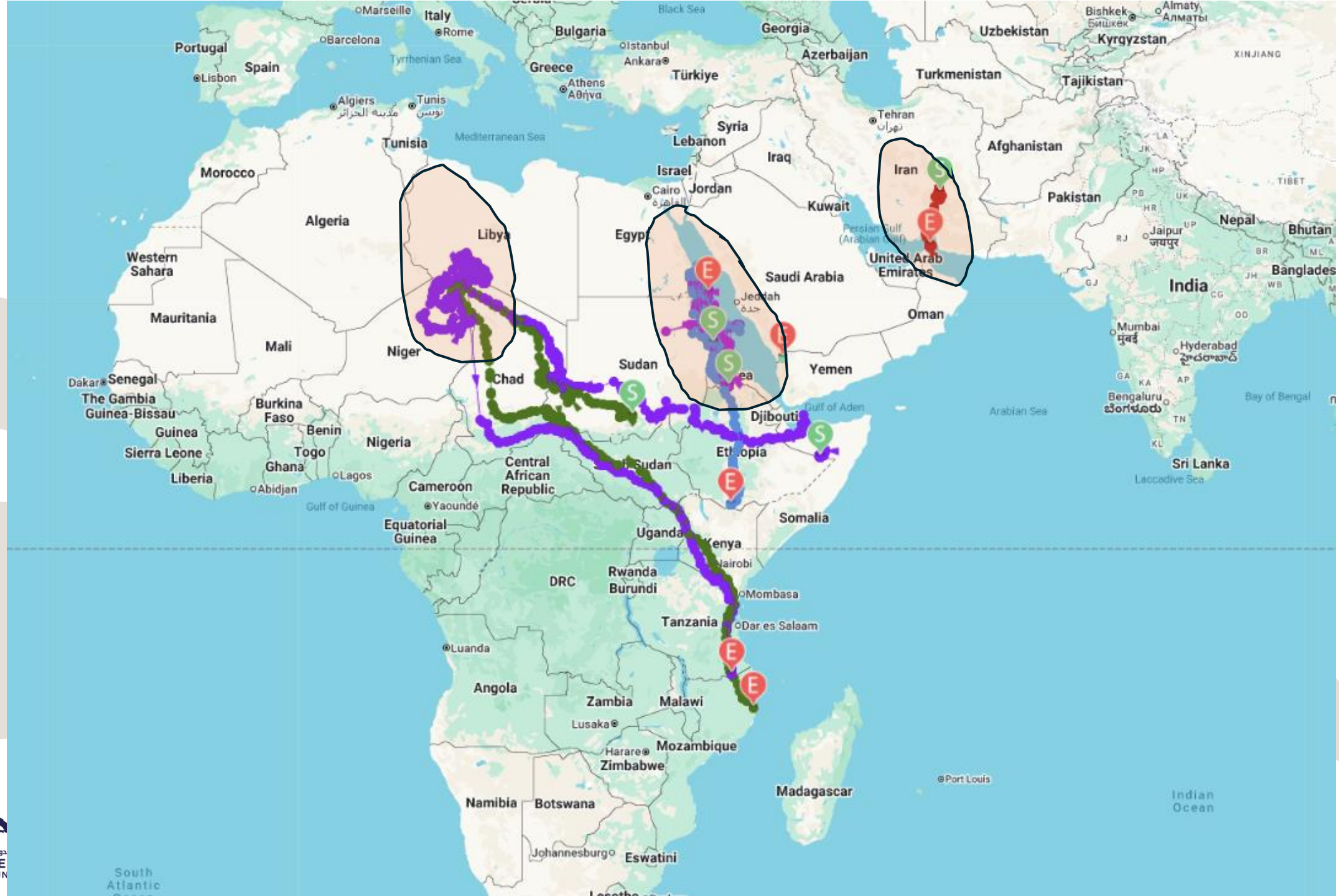
MOHAMED BIN ZAY
RAPTOR CONSERVATION FU

579

صندوق محمد بن زايد للمحافظة على الطيور الجارحة
MOHAMED BIN ZAYED
RAPTOR CONSERVATION FUND



MOHAMED BIN ZA
RAPTOR CONSERVATION



MOHAMED BIN ZAYED
RAPTOR CONSERVATION FUND

The Dual Pesticide Threat: Quelea & Locust Control in the Horn of Africa

Sooty Falcons face a deadly convergence of two intensive pesticide campaigns in Ethiopia's critical migration bottleneck

Quelea Control Operations

$88.6M Annual crop losses

Queletox® (60% fenthion): Organophosphate cholinesterase inhibitor. Red-billed quelea billed quelea devastate sorghum, millet, rice, and wheat across sub-Saharan Africa. Africa

Secondary poisoning: Raptors consume contaminated carcasses carcasses

Locust Control Campaign

1.6M+ Hectares treated (2019-2021)

Primary agents: Fenitrothion, Chlorpyrifos, Malathion, Deltamethrin. Organophosphates & Organophosphates & pyrethroids applied at 400-500 g/ha—near threshold for avian avian mortality.

Direct exposure: Falcons feed on contaminated locusts locusts

The Deadly Convergence

Sooty Falcons funnel through Ethiopia's Rift Valley during post-nuptial migration, overlapping with **intensive quelea AND locust control operations** . Falcons are insectivorous during migration, feeding on the very targets of pesticide campaigns.

Tracking Evidence: Mortality in the Corridor

5,656 km	36-58 days
Total migration distance	Migration period

Critical Finding: Multiple satellite-tagged falcons **ceased transmission in Ethiopia/Kenya region** —cause of mortality unknown.

Confirmed case: One mortality documented in Ethiopia Ethiopia

Secondary Poisoning Zone

20 km Radius

Raptors can fly **at least 20 km from poisoning sites** before dying. This creates a massive surveillance challenge—mortality occurs far from spray zones, making detection and documentation extremely difficult.

The Pesticide Corridor: Migration Route vs. Spray Zones

Migration Spray zones

CRITICAL BOTTLENECK

Rift Valley Corridor Corridor

Sources: CMS Sooty Falcon ISSAP (2024), FAO One Health Report (2025), Al Jahdhami et al. (2021)

Research Framework: Investigating the Ethiopian Mortality Hypothesis

A systematic approach to either confirm pesticide-related mortality or rule it out—enabling evidence-based conservation action

Core Hypothesis

"Sooty falcon mortality in Ethiopia is linked to **secondary poisoning from quelea and locust control operations** , with affected birds dying up to 20 km from spray sites, creating a hidden mortality hotspot in the Rift Valley corridor."

Alternative: If disproven, focus shifts to other mortality factors

Research Objectives

1. **Establish correlation** between spray events and tracking failures
2. **Identify mortality hotspots** within 20 km of spray zones
3. **Quantify actual vs. reported deaths** through systematic surveillance
4. **Determine causative agents** (fenthion, fenitrothion, etc.)
etc.)

Expected Outcomes

CONFIRMED
Pesticide threat validated → Immediate mitigation required

RULED OUT
Other factors identified → Redirect conservation focus

Systematic Investigation Methodology

Tracking Analysis
- Map last known locations of all tagged falcons
falcons
- Overlay with spray operation records (dates, locations)
- Calculate temporal and spatial correlations

Mortality Surveillance
- Deploy teams within 20 km radius of spray sites
- Systematic carcass search protocols
- Toxicological analysis of recovered specimens

Carcass Recovery
- 24-hour response teams post-spray operations
- Cholinesterase activity testing
- Pesticide residue analysis in tissues

Data Integration
- Centralized database of spray events & mortality
- GIS mapping of hotspots
- Statistical modeling of risk factors

Implementation Timeline

1. **Immediate Phase (0-6 months)** — URGENT
   - Secure government permits and partnerships
   - Analyze existing tracking data for mortality patterns
   - Establish baseline spray operation database
2. **Short-term Phase (6-12 months)** — ACTIVE
   - Deploy mortality surveillance teams during spray seasons
   - Implement carcass recovery protocols
   - Conduct toxicological screening
3. **Medium-term Phase (1-2 years)** — ANALYSIS
   - Complete statistical analysis and hypothesis testing
   - Publish findings and recommendations
   - Develop mitigation strategies if threat confirmed

Partners: Ethiopian Wildlife Conservation Authority, FAO, CMS Raptors MOU

EVIDENCE-BASED Confirm or Rule Out

Key Questions

- What is causing a high tag failure? Birds dying? Inefficient tags? Mounting method?
- Will “last points” of ever tracked sooty falcon give us clues?
- Can we rule out pesticide poisoning as a major threat to SFs

صندوق محمد بن زايد للمحافظة على الطيور الجارحة
MOHAMED BIN ZAYED
RAPTOR CONSERVATION FUND

MOHAMED BIN Z
RAPTOR CONSERVATIO