Transformative Solution to Combat Wildlife Poaching: Airborne Synthetic Aperture Radar

Introduction: Millions of animals are falling victim to snares globally, making snaring the second most significant threat to wildlife after habitat loss. Conventional patrolling methods often miss > 80% of snares, exacerbating the crisis. Our solution, the Airborne Synthetic Aperture Radar (SAR), is a groundbreaking technology that can revolutionize snare detection and conservation efforts.

The Problem:

1. Snaring is a severe threat to wildlife in conserved areas, jeopardizing apex predators and entire ecosystems.
2. Existing patrolling methods are inefficient, leading to a decline in wildlife populations.

Why SAR is the Solution:

1. **Active Detection Strategy:** SAR actively floods the area with radio signals, detecting even the smallest reflections off metal surfaces (98% of snares are metal).
2. **Penetrates Vegetation:** Operating at 2 GHz, SAR penetrates vegetation, enabling the detection of snares in challenging environments.
3. **High Resolution and Speed:** SAR's high resolution remains consistent over a 1km width, allowing for thorough searches at a speed of 72 km/hr.
4. **Multiple Polarizations:** SAR operates in 4 discrete polarizations, enhancing the identification of reflective targets like snares.
5. **Proven Technology:** SAR has successfully detected objects as small as 0.5mm in diameter, demonstrating its potential efficacy.

Game-Changing Impact:

1. **Economic Deterrent:** Detecting and removing snares at scale changes the economics of poaching, discouraging poachers from setting snares.
2. **Complete Coverage:** SAR's broad coverage prevents the displacement of snaring activities in response to local efforts, making poaching unfeasible.
3. **Save Millions of Lives:** Timely detection and removal of snares will save millions of wildlife lives, preserving biodiversity.

How the System Works:

1. Long-endurance drones equipped with SAR fly predefined missions, scanning entire reserves at 120m above ground.
2. SAR transmits radio signals at 2 GHz, penetrating vegetation and operating day or night.
3. Real-time GPS and INS systems ensure < 1m accuracy in locating reflective targets.
4. Data is uploaded to the cloud, analyzed, and mapped for immediate action by anti-poaching units.

What We Need:

After 3 Initial trials that Demonstrate SARS ability to fly a mission and detect metal targets in a 1km wide band flying at 120m above ground level we need 6 months funding ($93,000).

1. Funding for further data processing by an electrical engineer: 160hrs@$25 = $4,000
2. Funding for a suitable testing drone: $40,000
3. Funding for 6, 5-day field trials: $25,000
4. Funding for a month's analysis of each field trial: $20,000
5. Funding for 1 month collating and setting up, large scale field trials in reserves $4.000

Collaborators:

1. **Dr Dave Gaynor:** Wildlife conservation biologist, fellow of the Mammal Research Institute
2. **Michael Inggs:** Emeritus Professor with expertise in radar sensor networks and remote sensing.
3. **Kevin Gema:** SAR Systems Engineer at Dragonfly Aerospace with extensive experience in radar and electronic defence.

Conclusion: Investing in our Airborne Synthetic Aperture Radar project is a chance to be part of the single most significant conservation intervention. Together, we can save millions of animal lives and preserve our precious ecosystems. Join us in this endeavour to combat wildlife poaching and make a lasting impact on global biodiversity.

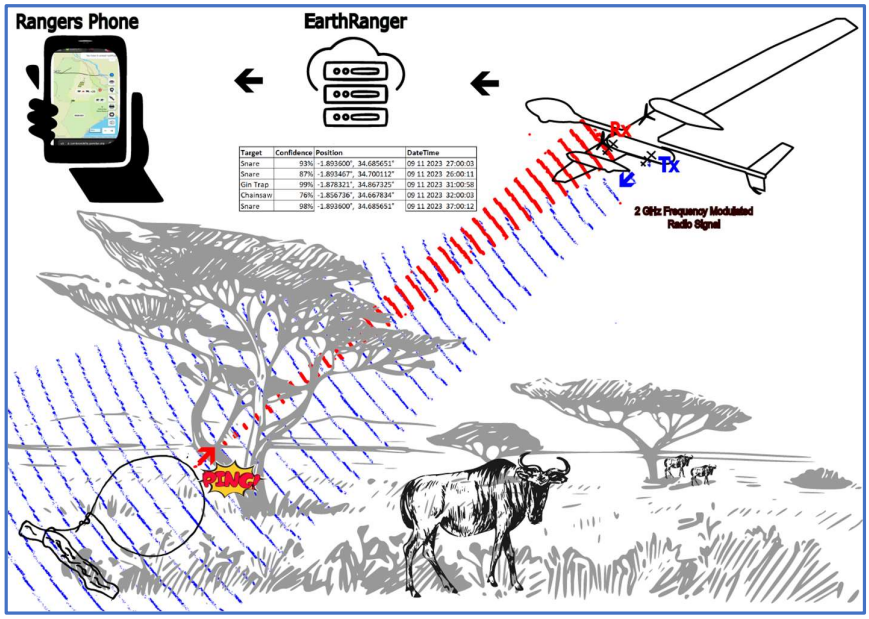

Fig. 1: How air-borne SAR detection of snares will work.

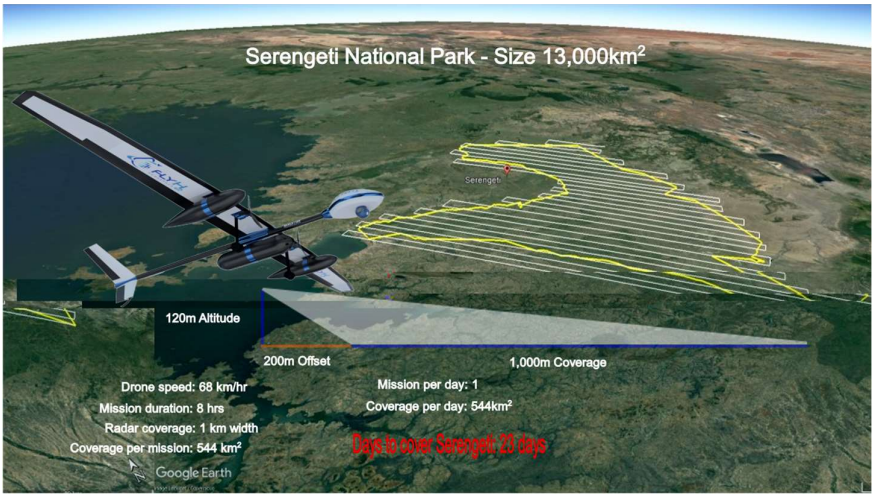

Fig.2: What air-borne SAR will work in a large-scale conservation environment.

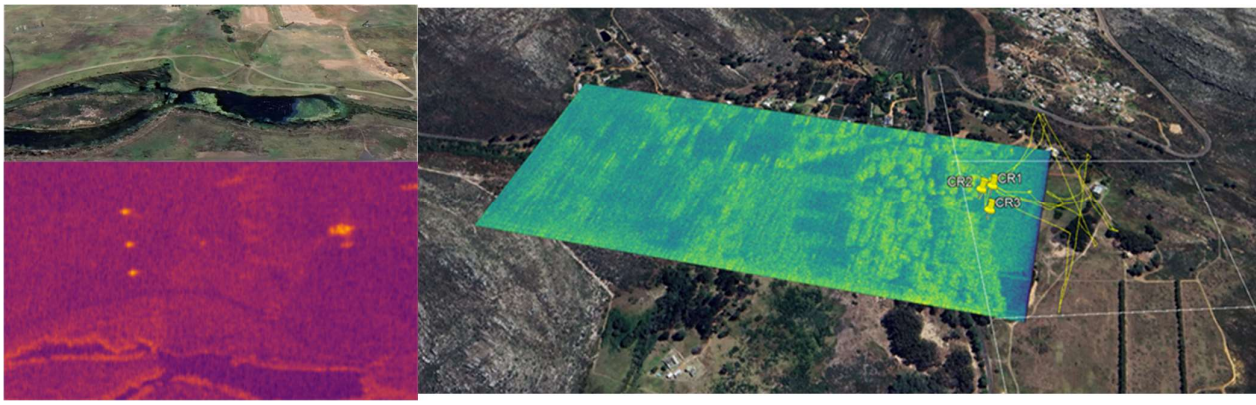

Fig. 3: Initial results for detecting targets at 120m above ground in a 1km wide swath.