PandaSat
Space Technology for Wildlife Conservation
ESA Φ-Week
14 November 2018
Populations declining in all realms, most of all in the tropics
Threats to wildlife worldwide
Bending the curve

“Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity; Integrate [...] the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.”

CBD

“...achieve by 2010 a significant reduction of the current rate of biodiversity loss.”

COP6

UN Decade of Biodiversity (2011-2020): Strategic plan, 20 Biodiversity Targets across five strategic goals

Biodiversity index

Observed trends

Aichi Targets

Extrapolated trends

Modelled projections

1970 1990 2010 2030 2050
Why care about wildlife?

Birds & insects pollinate over 75% of food crops.

Nature provides food, water, air.
PandaSat – Innovative partnership for Conservation

- Global, innovative solutions are needed for this impeding crisis
- Applying innovation thinking to solve the most pressing needs in conservation
- Building strong partnerships to enable expertise and resources used where most needed
- Building a Social Enterprise to ensure the technology, methods, and expertise reach the people most in need
New technology to fight wildlife crime

Tiny Satellites!

Gyroscope
Magnetometer

Solar Cells
Microcontroller

Radio
Antenna

Tiny Trackers!
Nano-Tags & Nano-Satellites
Thr PandaSat Ecosystem

• Technology is getting better and smaller, but lags for many wildlife applications
• Micro trackers allow for many more user cases
• Nano satellites make space accessible
• Lower pricing allows wider use of technology
Use Cases: Grey Parrots - *Psittacus erithacus*

- Intelligent, talking bird
- Highly trafficked, endangered, decapitated for rituals and sold as pets
- Little to no information on breeding sites, preferred trees, daily and seasonal movements
- Where should we protect them?
- Can we identify where they are being captured?
Use Cases: Giant Pangolin - *Smutsia gigantea*

- Most trafficked species in the world: 
  1 million pangolins poached in the last 10 years; 20 tonnes every year
- Cure for ailments, delicacy, huge demand
- Vulnerable and decreasing (all Asian species are endangered or critically endangered)
- Solitary, nocturnal burrowers, very little

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**Locating Giant Ground Pangolins (Smutsia gigantea) Using Camera Traps on Burrows in the Dja Biosphere Reserve, Cameroon**

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**Abstract**

Giant ground pangolins (*Smutsia gigantea*) are poorly known and difficult to study due to their nocturnal and burrowing habits. Here, we test the efficacy of using camera traps on potentially active burrows identified by local Ba’Aka guides to rapidly locate giant ground pangolins in the wild for subsequent observation and tagging for telemetry studies. We deployed nine cameras on potential giant ground pangolin burrows in the Dja Biosphere Reserve, Cameroon. One camera photographed an adult male giant ground pangolin using a burrow within 2 days of camera deployment. The pangolin used the same burrow several times over a 25-day period and possible scent-marking behavior was recorded.

**Keywords**

*Smutsia gigantea*, burrow, giant pangolin, Dja Biosphere Reserve, Cameroon
Use Cases: Forest Elephants - *Loxodonta africana*

- Different than savanna elephants (likely different species)
- Solitary, elusive, less seasonal migration
- Change their behaviour in response to poaching threat, gunshots
- Human-wildlife conflicts
- We know very little about their movements and ranges over time
- Few tracked individuals
- How can we observe changes in movements to actively protect them?
Future opportunities

- Thinking beyond conservation
- Humanitarian NGOs
- Rural, low income communities
- Niche data collection and analysis
- Achieve multiple SDGs
Next Steps

• Initial tag/sat build
• Beta supply chain analysis
• Data analysis platform
• Raise funding
• Launch a PandaSat constellation
Why we are here

- Strategic Funding and Partnerships
- We need rides into Space!
- Join our Community!
- Help shape our business!
- Do something good

Come talk to us!
IN-HOUSE WILDLIFE EXPERTS

OFFICES IN OVER 100 COUNTRIES

FIRST-HAND KNOWLEDGE OF LANDSCAPES

PROVEN SCIENCE AND CONSERVATION TRACK RECORD

GLOBAL REACH AND MOBILIZATION

PARTNERSHIPS WITH LEADING INNOVATORS

COMMITMENT TO CONSERVATION AND SUSTAINABILITY