Plan To Make Kenya The World Leader In Drones For Conservation

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To reduce conflict/competition between people and wildlife there is a need for a holistic and adaptive drone approach that is respectful of the law, supported by wildlife managers, engages communities and maintains enough space for both to thrive. Years of research suggest that drone-based methods offer a promising new tool to integrate within a broader KWS suite of proactive, community-based, low-cost mitigation approaches to reduce negative interactions between people and wildlife; especially elephants.

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EGYPT: Owl Vision Drones used for media and Film

SOMALIA: SPF use Mavic drones for tactical operations against Al Shabaab in Mogadishu and port inspections near Mogadishu International Airport

RWANDA: ZIP LINE – Fixed wing Beyond Line of Site drone capability have set up an integrated UTM Unmanned Aircraft System for Traffic management. ZIP LINE use drones for blood deliveries and currently supply 20% of Rwanda's blood supplies to remote locations across Rwanda. They can deploy blood to any part of the country in 15 mins using their drone system.

TANZANIA: VULCAN Inc. are testing drones for conservation

MALAWI: UNICEF— Have been developing drones in what is otherwise known as the test corridor is designed to provide a controlled platform for the private sector, universities, and other partners to explore how drones can be used in scenarios that will benefit marginalized communities. All data generated by the flights will be used to inform the Government of Malawi's plans for the use of drones in multiple scenarios. This is particularly important due to frequent flooding in some areas of Malawi and challenges in transport infrastructure.

SOUTH AFRICA: UDS UAV & DRONE SOLUTIONS - They have developed drones which have been used in the luhluwe-iMfolozi Game Reserve in the KwaZulu Natal for anti poaching and surveillance missions.

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Future Developments

Drones

- Drone technology has advanced significantly over the past 5 years
- Technology is now reliable, affordable, and proven to be effective in a variety applications
- Opportunity for Kenya to lead the way in the application of the technology in wildlife management and security

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Make KWS the global leader in using drones for conservation through the development of next generation information intelligence technology (AI) and UAV and information analytics capability, ultimately designed to enhance Kenya's anti-poaching, wildlife habitat and ecosystem conservation efforts.

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KWS SHORT-RANGE DRONES

Short-range drones provide a tactical, cost- effective solution for Rangers in the field that can save lives:

- Rapidly deployable 7Km Range
- Live-Stream video back to Commanders
- Instant assessments
- Tactical surveillance capability
- Ability to move wildlife from danger

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KWS MEDIUM-RANGE DRONES

Medium-range drones provide a longer-term solution that can carry heavier payloads and sensors for Rangers in the field:

- 20-40Km Range
- 2-3Hr Flight Time
- Increased payload Night-vision/thermal capability
- Stronger in inclement weather

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Long-range drones will provide a persistent, 24-Hour surveillance capability for KWS oversight management.

- Complete situational awareness
- Can be launched from Nairobi and cover Masai Mara 1500Km Range 90km/hrs
- Lands w/out runway
- Night-vision/thermal capability

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WILDLIFE CONFLICT MITIGATION WILL PROVIDE THE FOLLOWING BENEFITS:

- Collect important aerial data through both day and night vision sensors that can be further analyzed and used to enhancing the safety of KWS rangers, scientists, local farmers and elephants.
- Migration tracking and monitoring the elephant population in hard to reach areas.
- Perimeter assessments
- Local habitat management: mapping degraded areas, logging sites, charcoal sites and fires.
- Species identification through the use of new Artificial Intelligence (AI) solutions that can identify animal though their heat signatures.
- Thermal imaging to analyze and count wildlife numbers and locations.
- Provide a humane way for KWS rangers to move elephants away from conflict zones by flying the drones over them.

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MOVING ELEPHANTS AT NIGHT USING DRONE EQUIPED WITH THERMAL IMAGING CAMERA

ALONG WITH ANTI POACHING ACTIVITIES, DRONES CAN FULFILL ALL THE FOLLOWING CONSERVATION TASKS:

- Mapping techniques and deforestation surveys.
- Anti-poaching operations (identification/deterrence) to surveil poachers and identify camps: see over the horizon capability.
- Live streaming of drone cameras back to KWS HQ for further awareness and coordination at the executive level.
- Provide KWS with a force-multiplier capability and reduce risk to ranger elements in the field.
- KWS security operations of VIPs.
- Animal/flock counting and Habitat management

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Training TANAPA rangers in the Tarangiri National Park in Tanzania how to use drones to move elephants out of farms.

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Ruler

Line | Path | Pro

Measure the distance between multiple points on the ground

Length: 3.73 Kilometers

☑ Mouse Navigation   Save   Clear

Lemek

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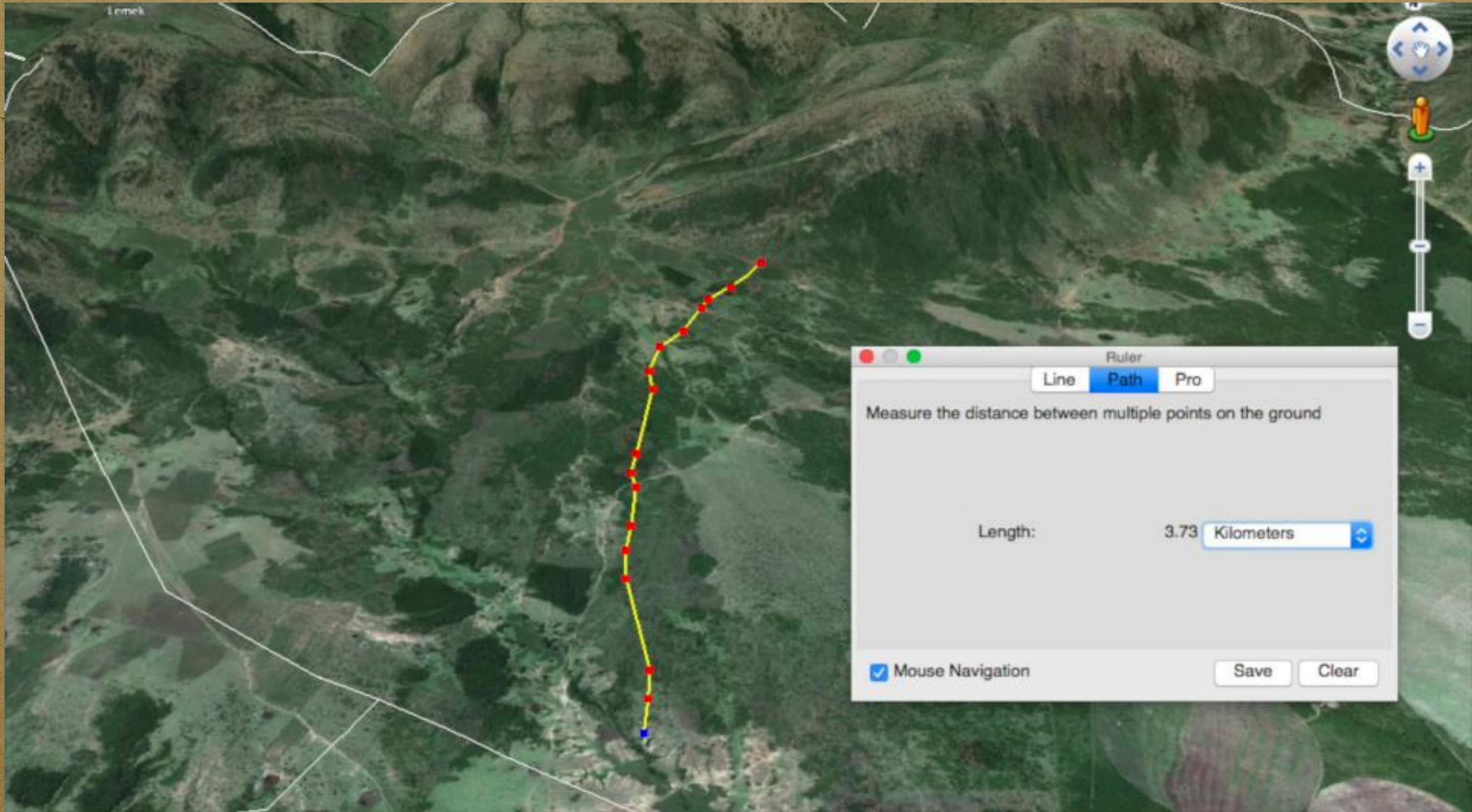
KWS Airwing will look to create a holistic 24hr surveillance/information gathering and analytics capability that feeds a national intelligence picture, drives proactive intelligence driven operations, and provides a reliable mechanism for human wildlife conflict mitigation techniques.

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VTOL Drone

ALTI Transition Specifications

- 3m wingspan, 16kg MTOW (Class 2 compliant)

- 10+ hours flight time

- 40 knot cruise speed

- HD and thermal cameras with target detection and tracking

- 70km link range, with possibility to extend with radio relays

- Mode S transponder with ADSB out for air traffic integration

- $5 USD per hour material operating costs (excluding labour and insurance)

- Reduced training, maintenance, and operating costs compared to manned aircraft

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K W S   SPECIAL TASK DRONES

Special Task drones provide KWS with unique capabilities to mitigate human-wildlife conflict including:

- Deliver supplies to Rangers or locals
- Customized KWS solutions

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- Special unit drone training & mentoring

- Forensics +evidence gathering training & service Community

  activation and out reach program to feed intel

- World class tested analytics & UAV technology with associated NOC Command Center

  operations and asymmetric data & monitoring capability delivering 24hr surveillance

- Developed analytics advisory & information service

- Artificial Intelligence (AI) integration

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INTERGRATED DATA COLLECTION ANALYTICS INFORMATION AND ADVISORY SYSTEM

Geospatial data

Aerial Surveillance Data

Communication Data

Sensors Data

Visual observation data

Storage

Analysis

Reminders & Action Plans

Published Information

Reports

Alerts

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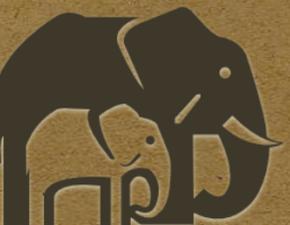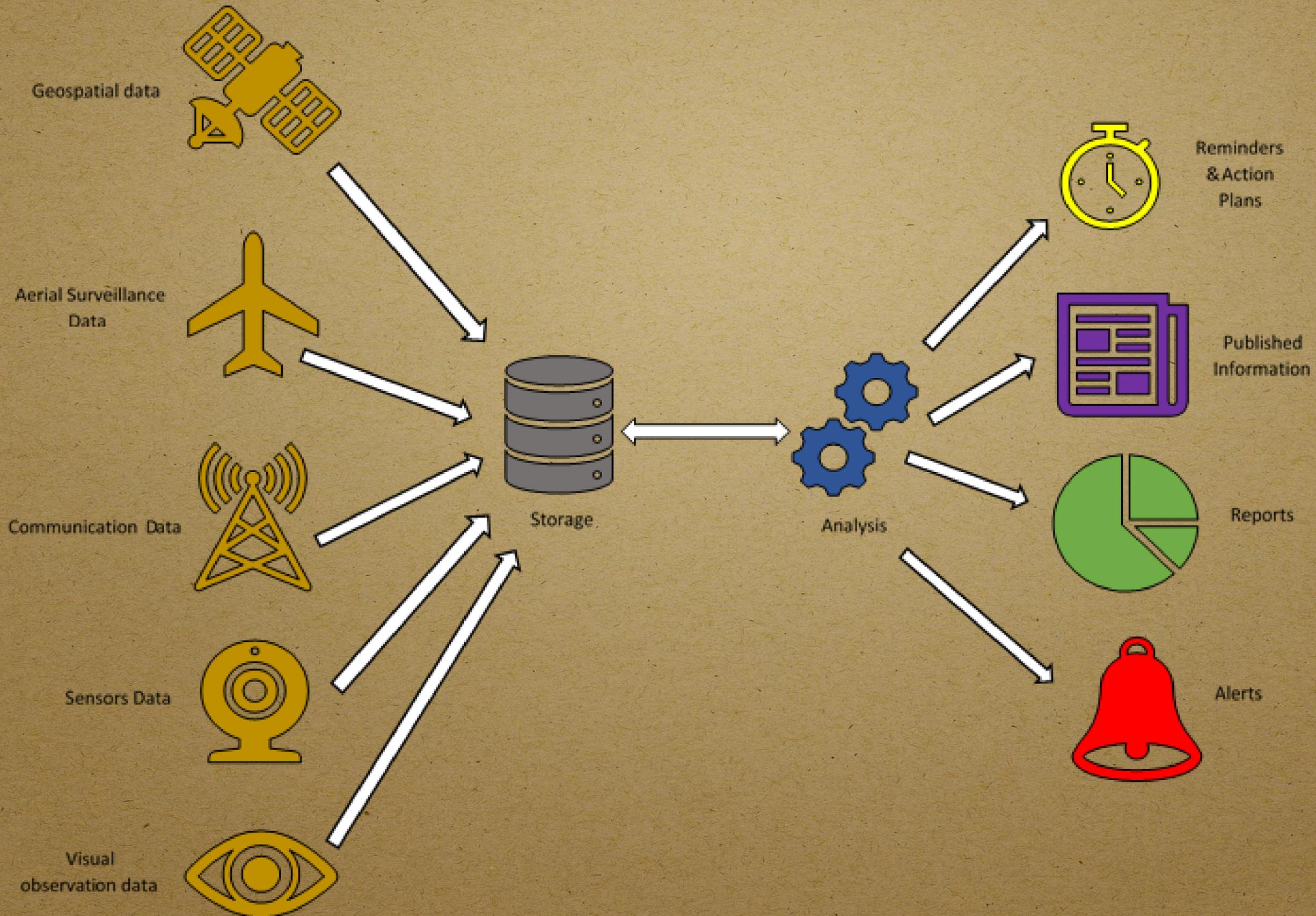
ARTIFICIAL INTELLIGENCE (AI) INTERGRATION

Drones equipped with AI is starting to play a role in protecting animals. New AI technology integrated into the drones not only helps identify endangered species in the wild, but also their poachers. The advanced A.I. software can also be used to send immediate alerts and warnings to park rangers if a human face is identified by various camera traps set around restricted wildlife preserves

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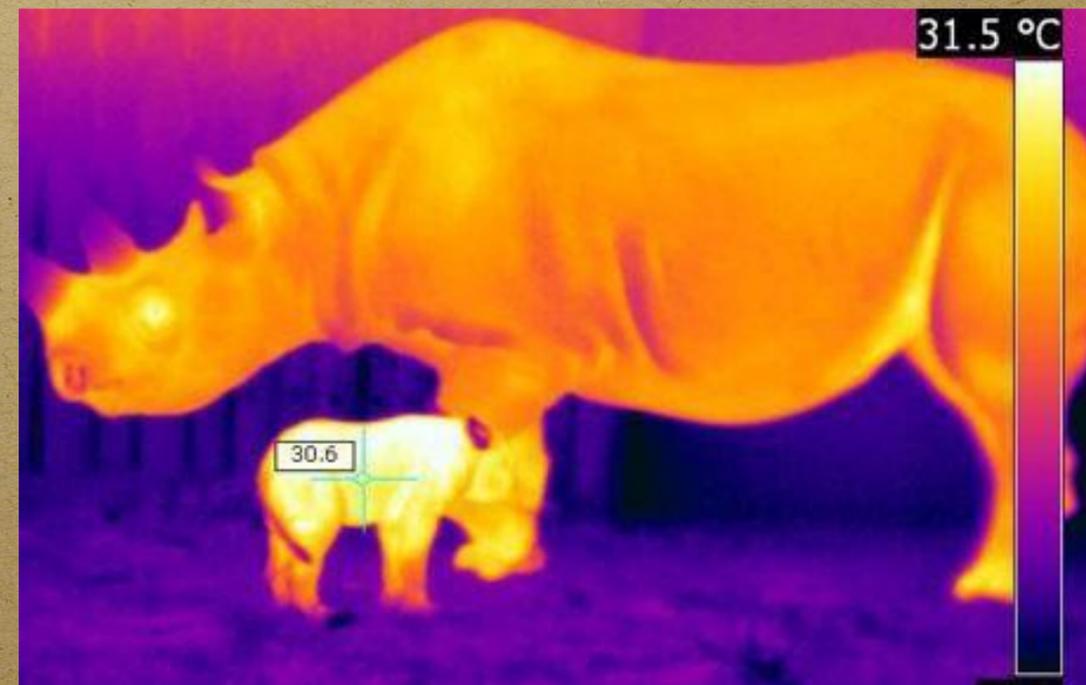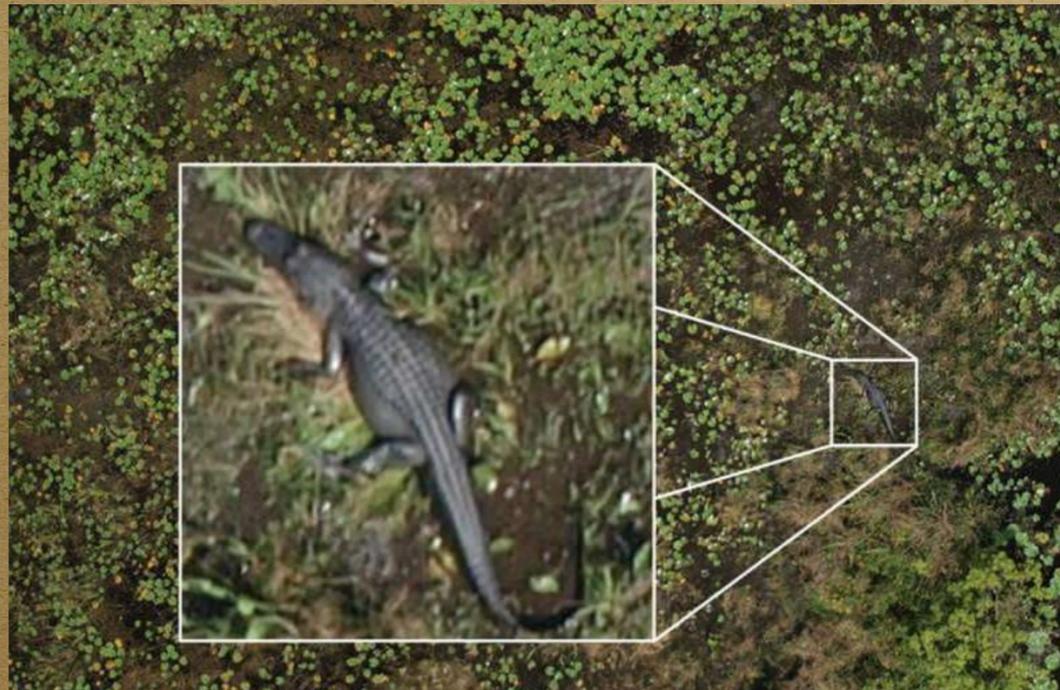
Wildlife Census Scenario

- Drone tasked to fly transects over area of interest

- Capable of surveying up to 500km^2 each flight

- Advancements in computer vision allow for automatic detection and classification of wildlife

- Quantitative data that can be independently verified, archived, shared, and used for other surveying purposes

- Order of magnitude cheaper than traditional aerial census methods
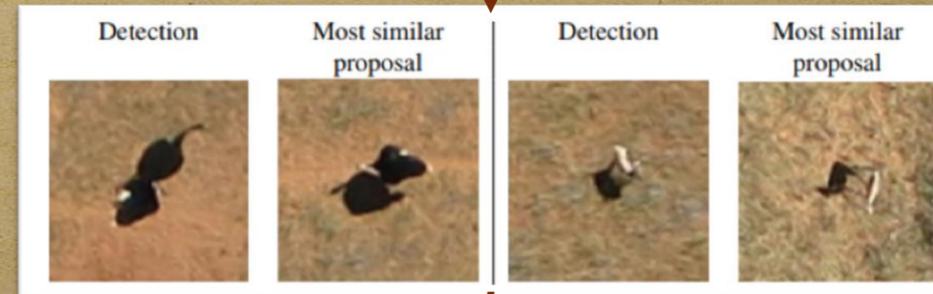
Wildlife	Identification Confidence	Time	Lat	Long
Elephant	97%	2018/05/28 -10:29	0°15'9.59"S	37°17'5.84"E
Elephant	98%	2018/05/28 - 10:29	0°15'9.13"S	37°17'4.71"E
Juvenile Elephant	86%	2018/05/28 - 10:30	0°15'7.80"S	37°17'6.82"E
Elephant	98%	2018/05/28 - 10:29	0°15'9.13"S	37°17'4.71"E

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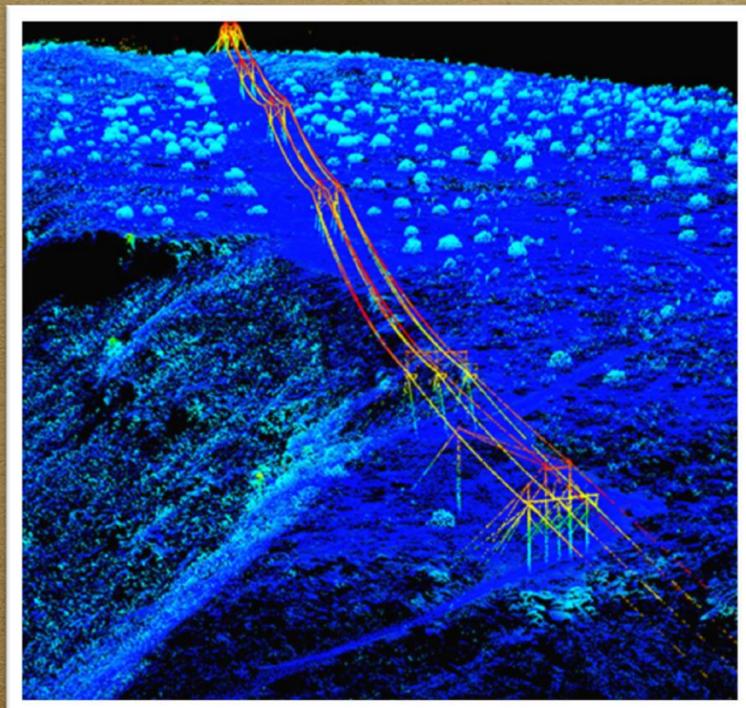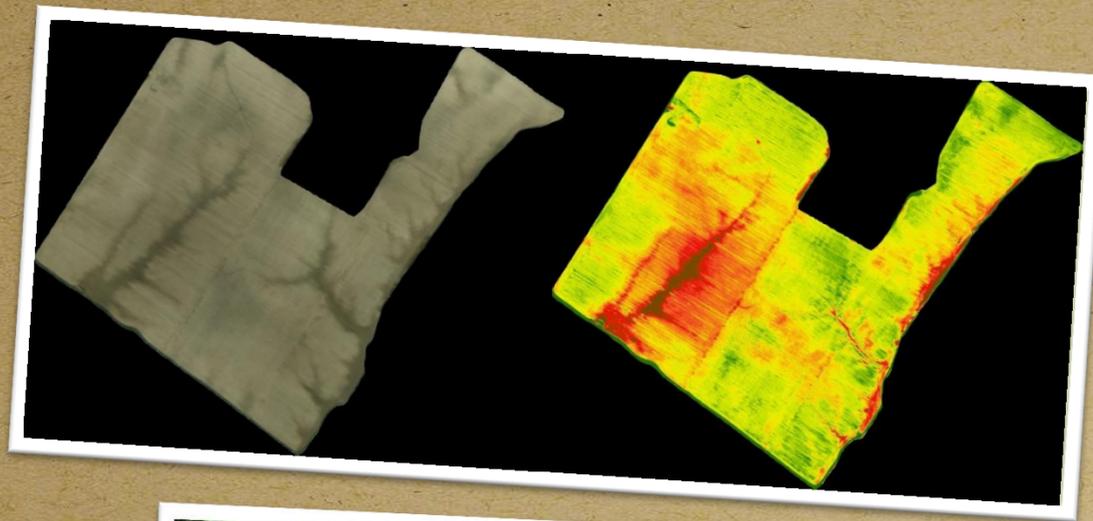
Vegetation and Infrastructure Surveys

- Hyperspectral remote sensing technology allows for accurate measurement of grass stocks

- Photogrammetry techniques produce Digital Elevation Models for flood prediction and infrastructure planning

- LIDAR sensor can be used for millimetre accuracy infrastructure inspections

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Drones

Applications

- Persistent night-time surveillance and Ranger support
- Reduced wildlife census costs, with verifiable and quantitative results
- Vegetation and Infrastructure Surveys

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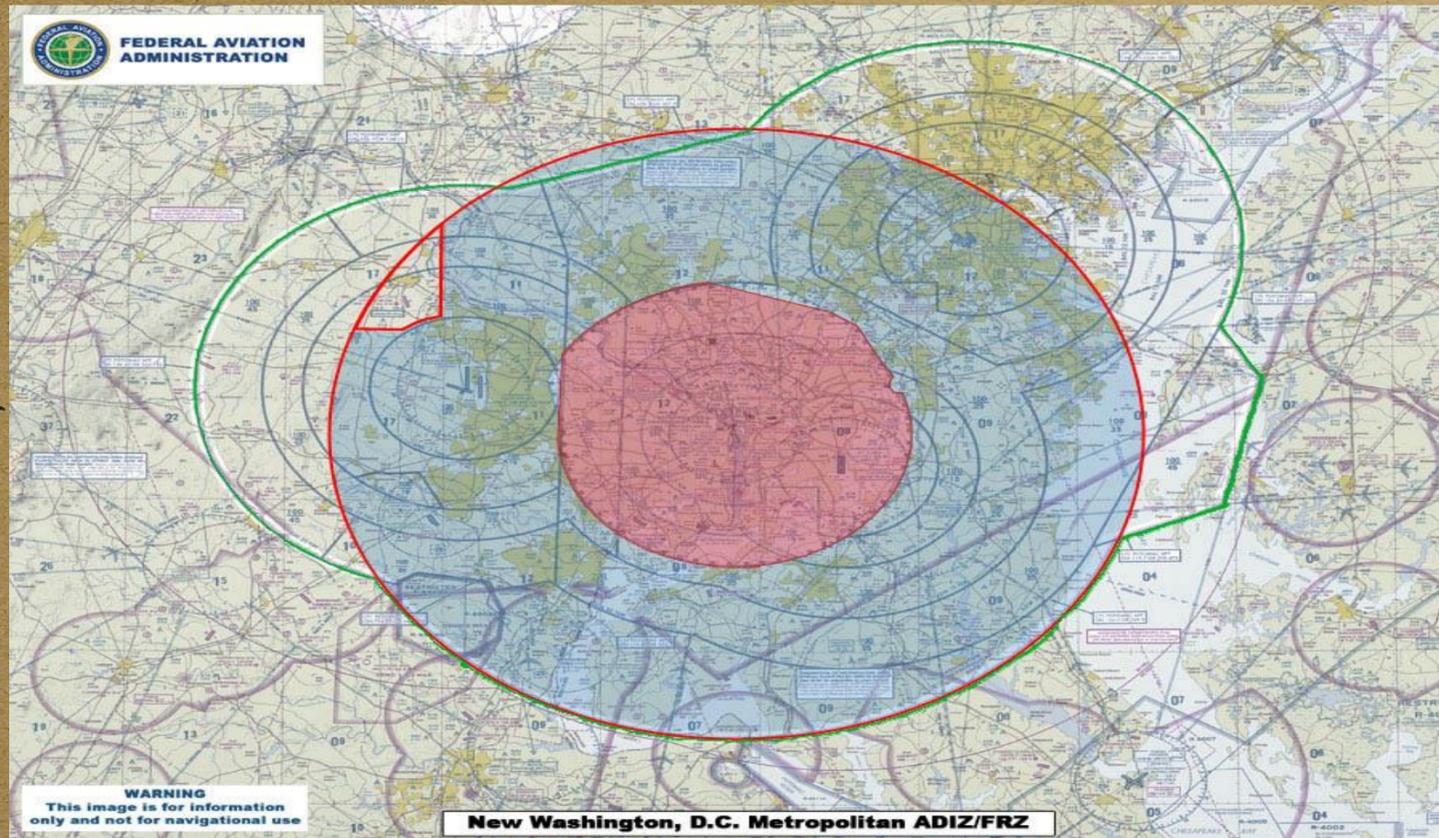
- Drones unlike aircrafts do not require specialized skills to operate and hence pose huge challenges of effectively managing them.
- This means a serious coordination between agencies is required to enforce regulations and ensure there is usage responsibility for security and various forms of data/ content protection
- The world now has embraced virtual reality and vast amounts of material are stored and shared online and in soft format. In this regard Data/ Content rights are pivotal to the proper funding of conservation going forward

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VALUE OF CONTENT

Online sale of images

Note the African Landscape and wildlife being used for profit .

This is an example of how the country and continent can be harvested for data and content of high value if the means to acquire the data or imagery is not properly controlled.

Drones are capable platforms to collect vast amounts of data and imagery at minimal cost and in a very short time span and with technologies now allowing for live and long-range data transmission there is a real risk that without carefully thought out mitigation measures in place the country stand out to lose in a big way.