Protected Areas and Conservation Technology

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Overview

- Protected Areas - Overview
- WCS role
- Case studies
  - SMART
  - Wildlife Insights
  - ConSoSci
- Gundi
- Discussion/Conversation

PAs & OECMs

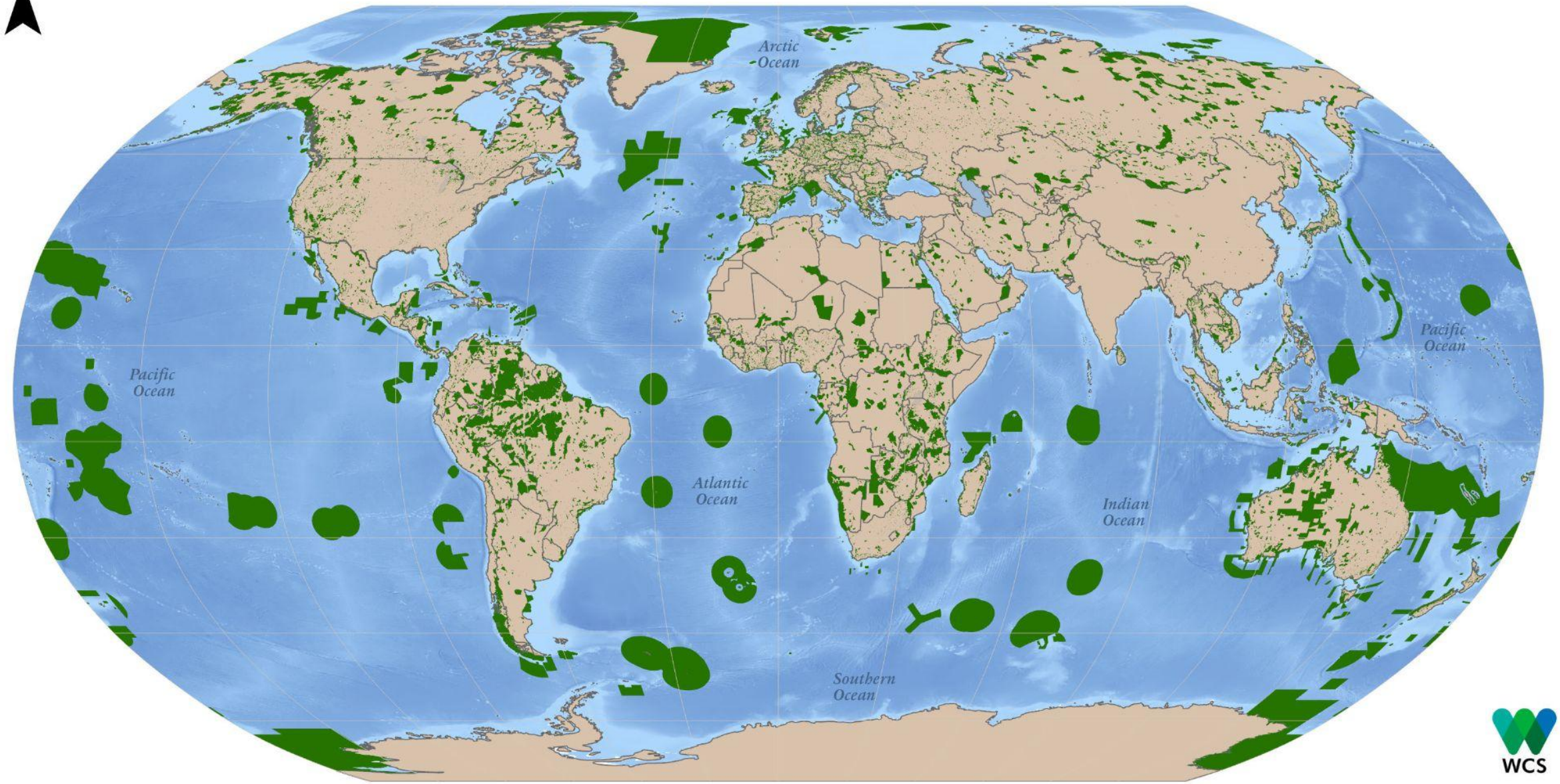
Protected Area

- **clearly defined** geographical space,
- **recognised**,, **dedicated** and **managed**, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.(IUCN)

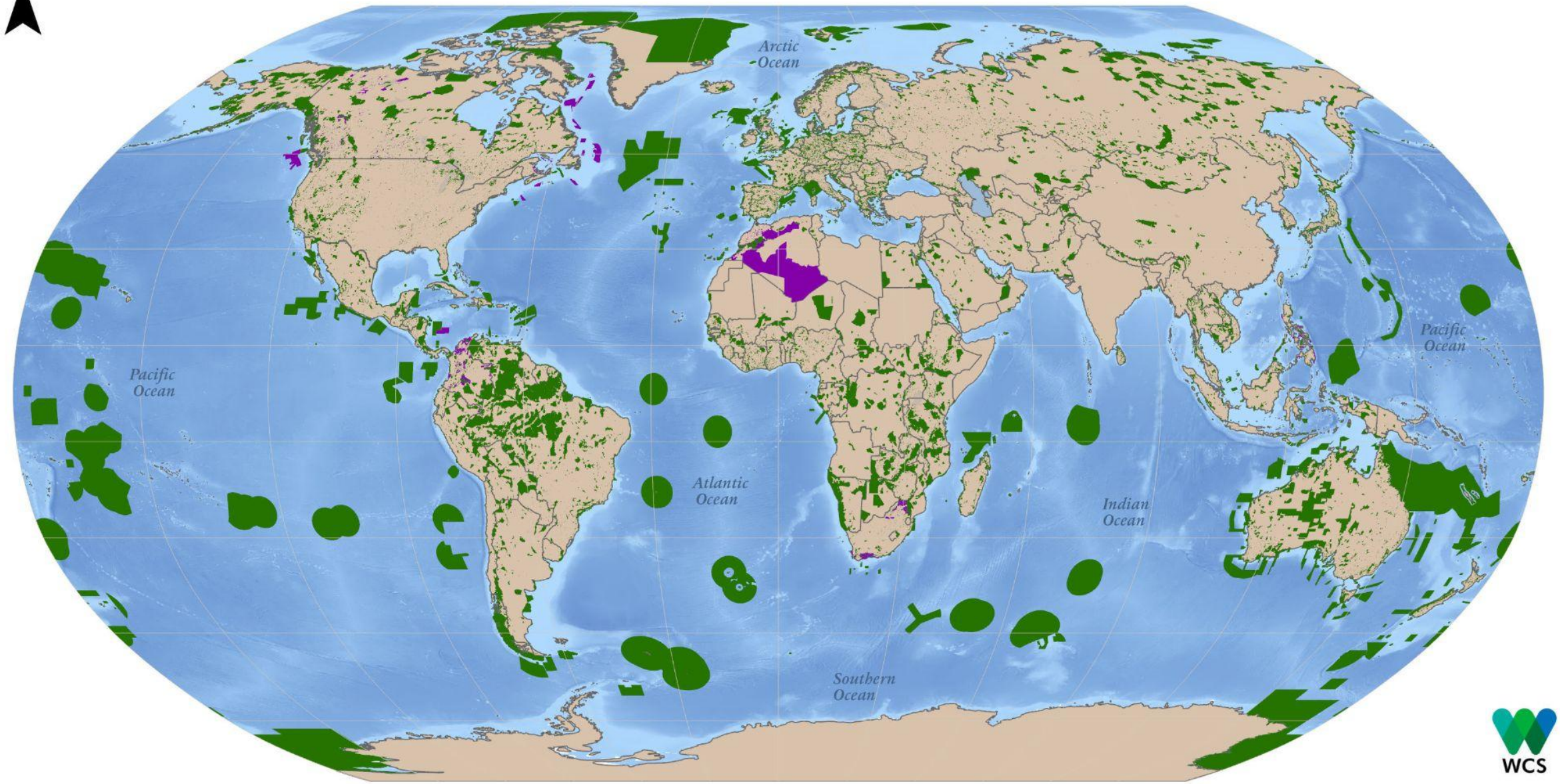
Other Effective area-based Conservation Measure (OECM)

- **geographically defined** area **other than a Protected Area**,
- which is **governed and managed** in ways that achieve **positive and sustained long-term outcomes** for the insitu conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio–economic, and other locally relevant values" (CBD, 2018)

PROTECTED AREAS OF THE WORLD

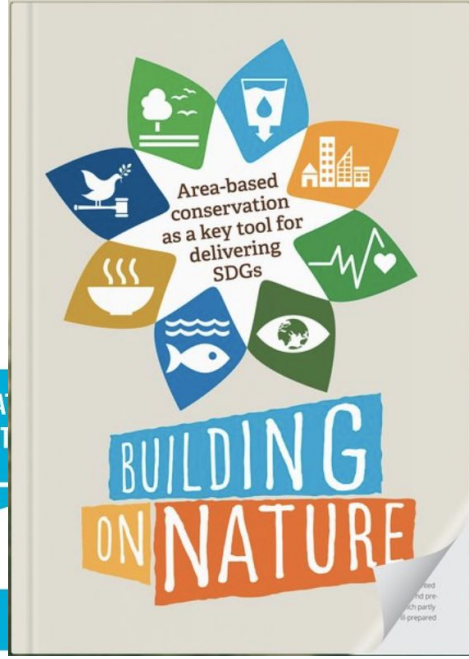


PROTECTED AREAS & OECMs OF THE WORLD



WCS

SUSTAINABLE DEVELOPMENT GOALS



https://ieep.eu/publications/building-on-nature-area-based-conservation-as-a-key-tool-for-delivering-sdgs

Effective area-based conservation is the single most powerful tool available to conserve biodiversity and deliver SDG 15.....

Target 15.1: **Conserve and restore terrestrial and freshwater ecosystems**

Target 15.2: **End deforestation and restore degraded forests**

Target 15.3: **End desertification and restore degraded land**

Target 15.4: **Ensure conservation of mountain ecosystems**

Target 15.5: **Protect biodiversity and natural habitats**

Target 15.6: **Protect access to genetic resources and fair sharing of the benefits**

Target 15.7: **Eliminate poaching and trafficking of protected species**

.... but only 24% terrestrial PAs & 7% marine PAs in Asia-Pacific w/ sound management *

* Watson, J., et al. 2014. The performance and potential of protected areas. Nature 515, 67–73 https://doi.org/10.1038/nature13947

Effective area-based conservation is the single most powerful tool available to conserve biodiversity and deliver SDG 15.

Scalable solutions for PA monitoring and decision making are critical to the future of the planet

* Watson, J., et al. 2014. The performance and potential of protected areas. Nature 515, 67–73 https://doi.org/10.1038/nature13947

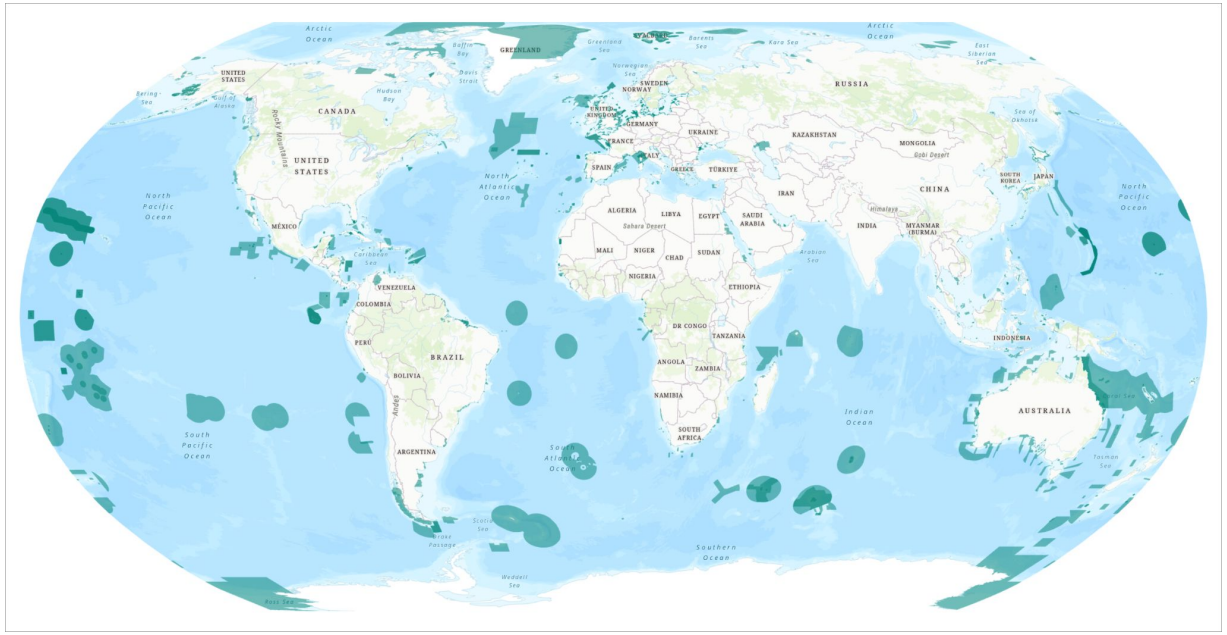
PAs & OECMs

Terrestrial

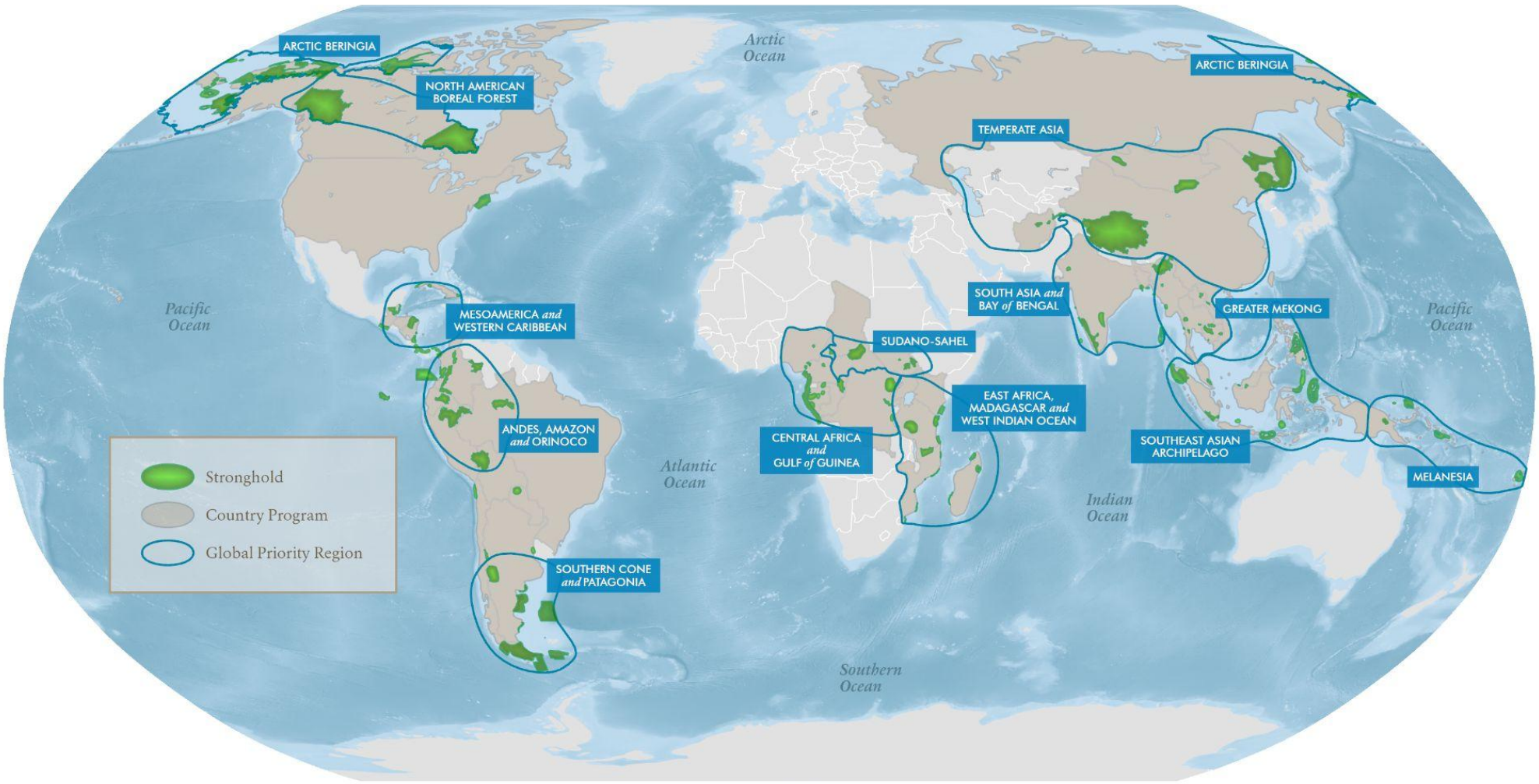
~254k PA/OECMs cover 22 million km^2 = 17%

Marine

~18k MPA/OECMs cover 30 million km^2 = 8%



WCS' Role with Protected Areas



60 countries - **372** PAs WCS supported - Blended management model

WCS' Role

ConsTech Decision Support Tools: Strong Focus on Partnerships

WCS

Wildlife Insights

SMART

ConSoSci

MERMAID

KoBoToolbox

MARXAN
conservation solutions

ESRI

MIRADI

Gundi

CyberTracker

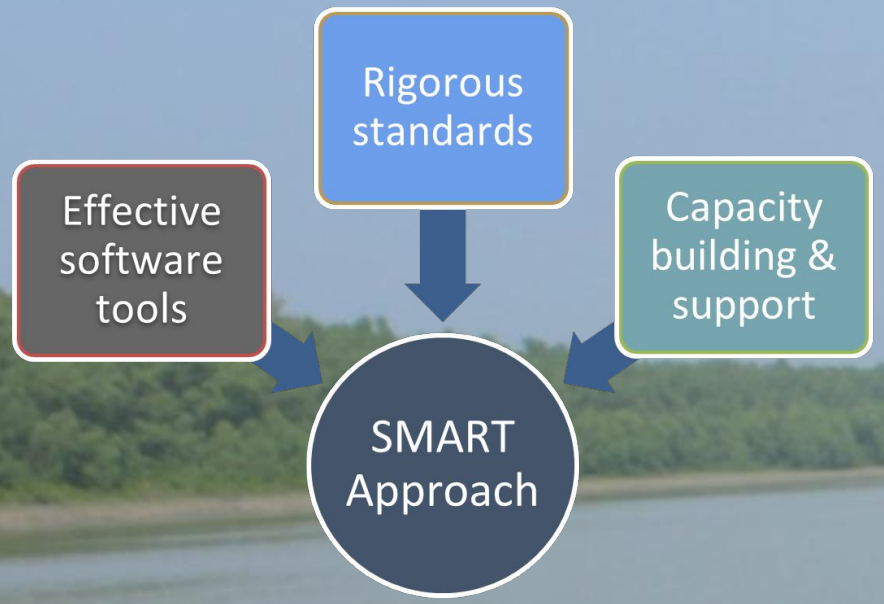
Google Earth Engine

PAWS: PROTECTION ASSISTANT FOR WILDLIFE SECURITY
PAWS applies AI for Wildlife Conservation.

EARTHRANGER
A product of AI2

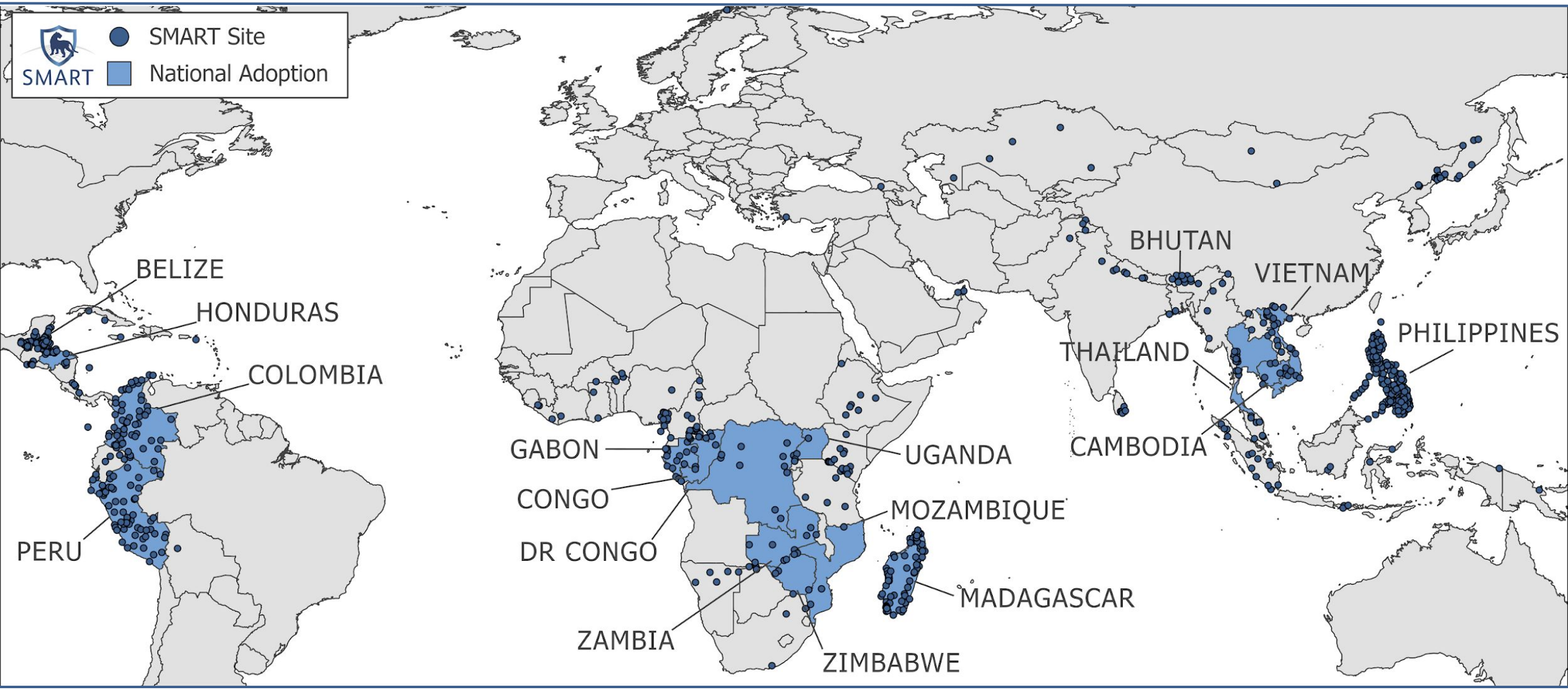
Case Study: SMART

To improve the effectiveness of protected areas management by empowering practitioners with the technology, services, and skills to make better use of existing resources.



Zahangir Alom | WCS Bangladesh

Global SMART Footprint



> 850 sites

≥ 65 countries

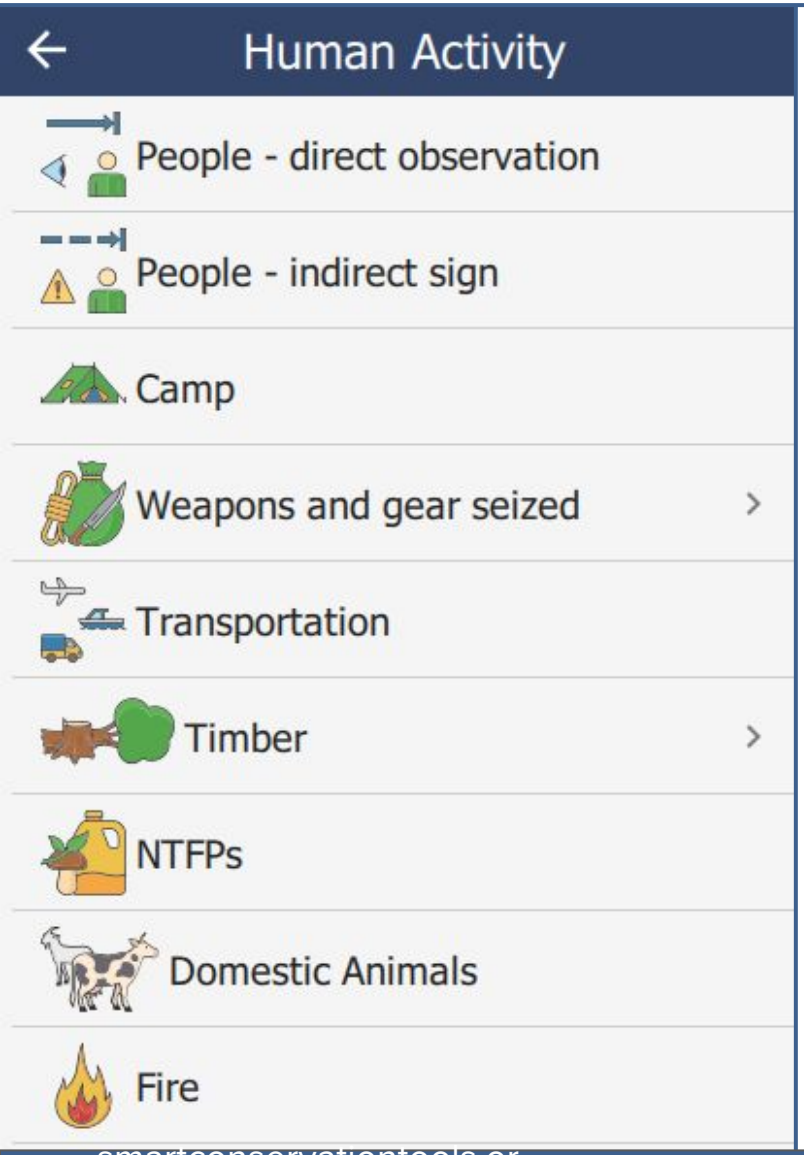
17 nat'l. mandates

SMART MOBILE

The best solution for capturing field conservation data

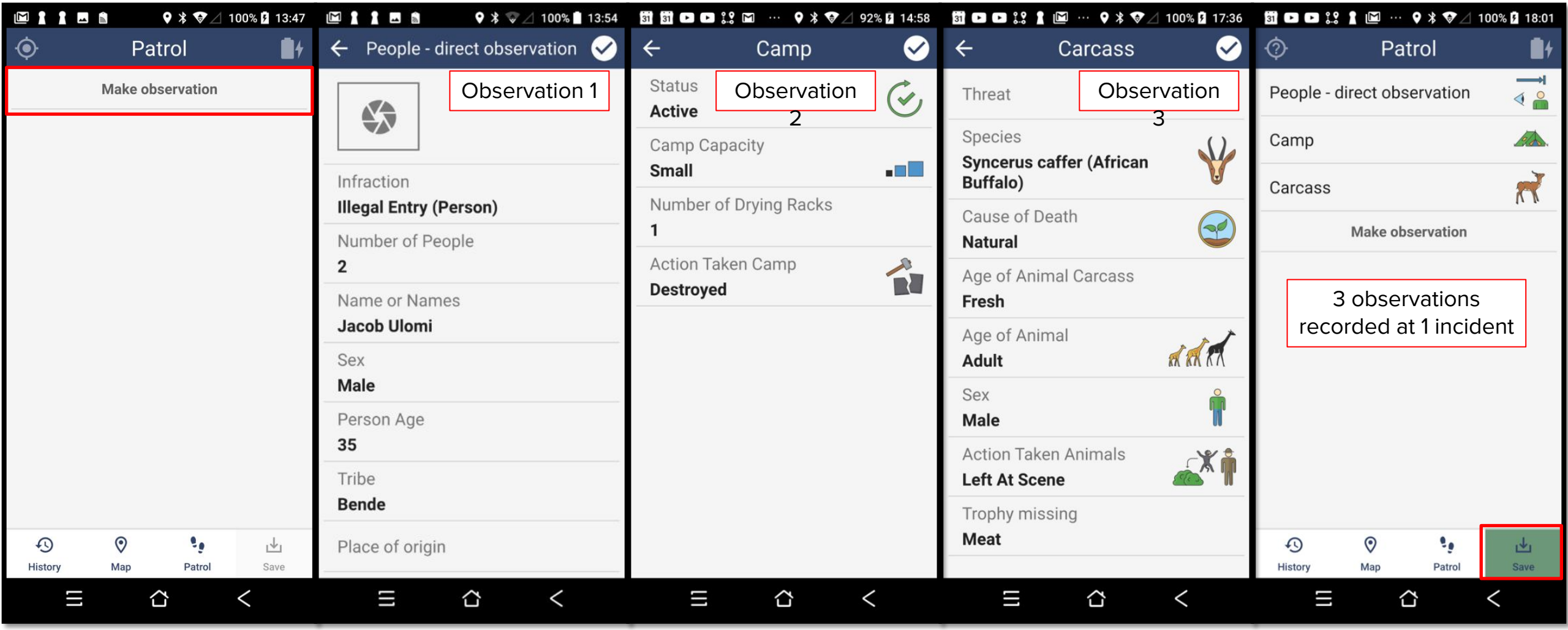
Credit: ZSL

SMART Mobile Key Features

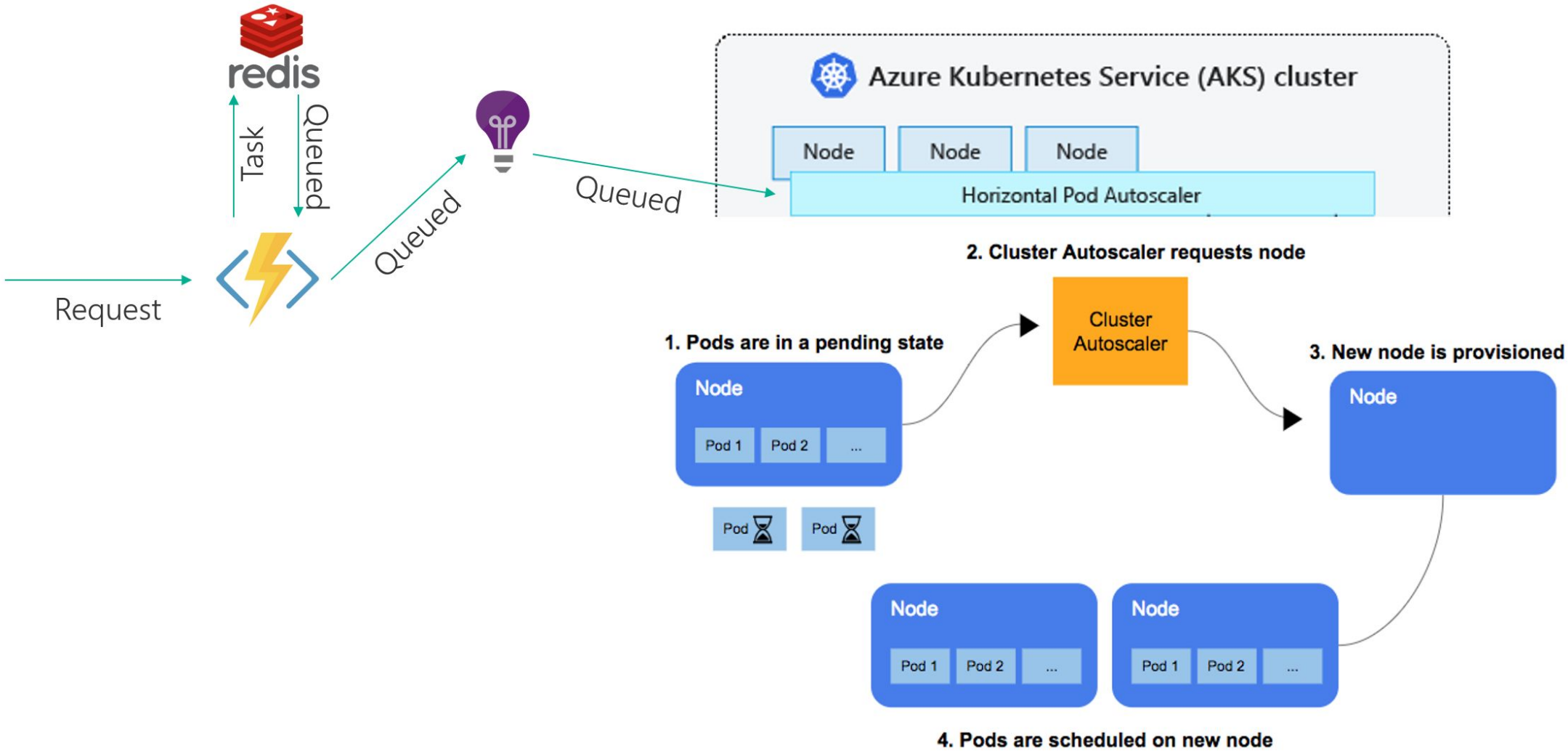


- Modern, easy to use interface
- Extensive suite of full-color icons & support for user-defined icons
- Support for multiple languages
- Dark mode
- Common smartphone navigation controls
- Advanced mapping and navigation
- ‘Go-to’ previous observations

SMART Mobile: Recording Multiple Observations



Microsoft Azure Infrastructure

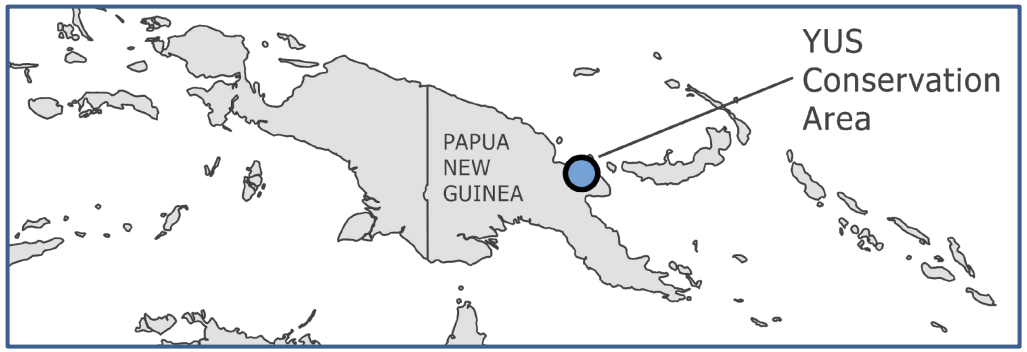


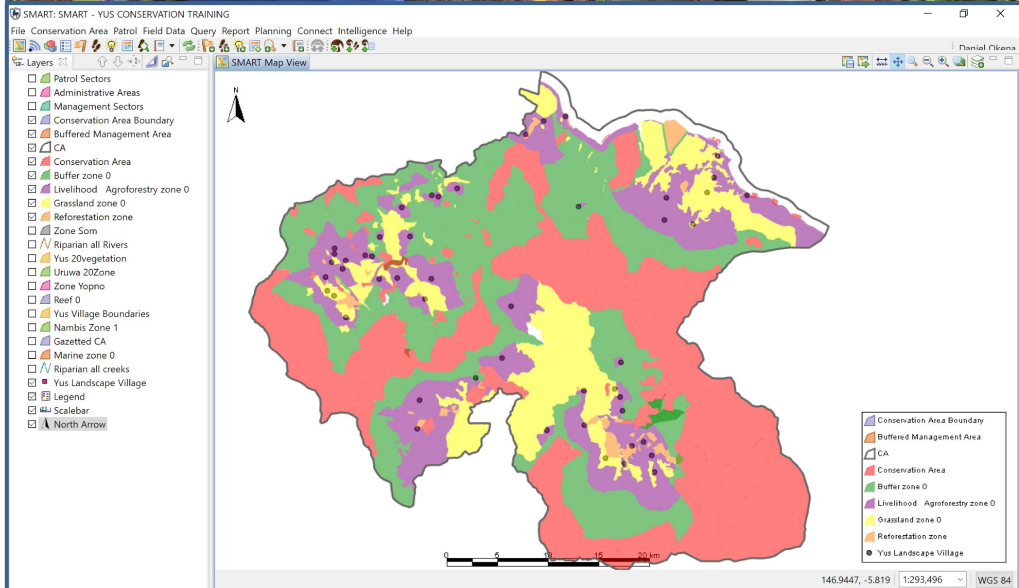
Does it work? Case studies

Community Managed Conservation in the YUS Conservation Area, PNG

Co-benefit SDGs

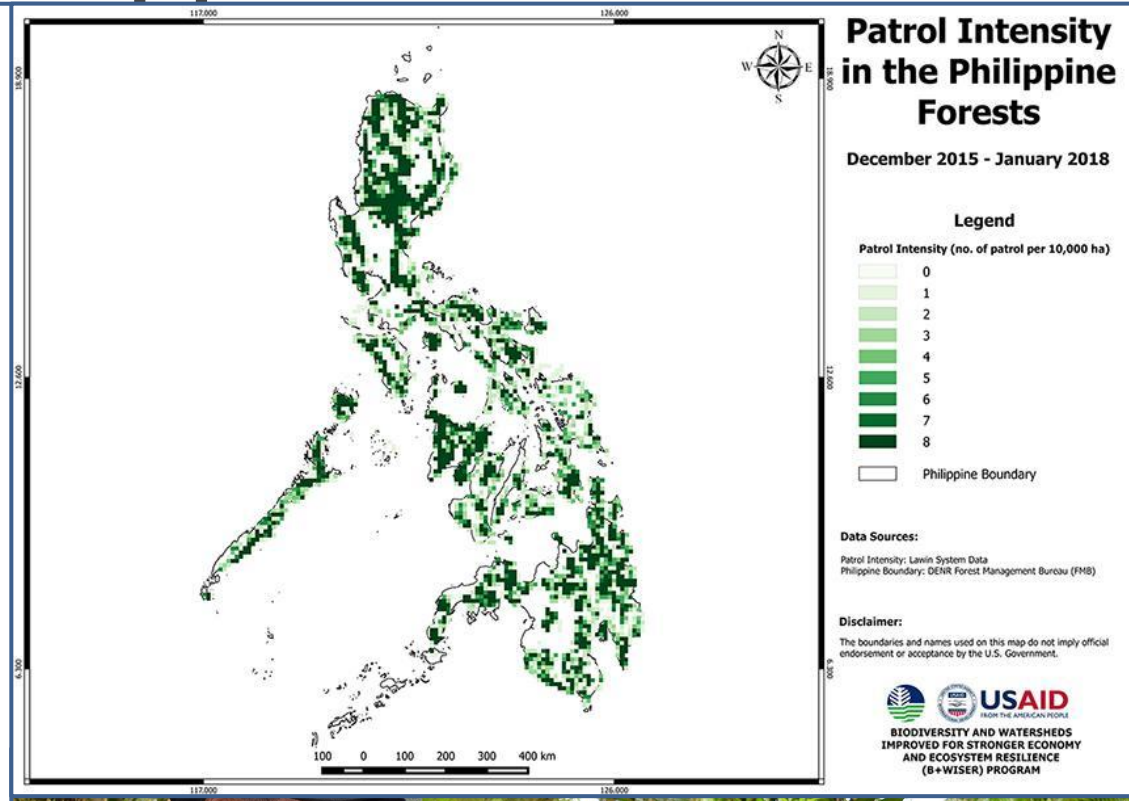
- SMART used for monitoring iconic wildlife & hunting
- Entirely managed by the community
- Volunteer rangers use Cybertracker on PDAs for data recording
  - Offline system due to remoteness
  - Data used for monitoring compliance with community agreements





‘Connected’ Forest Protection with SMART in the Philippines

- National system under Forest Management Bureau (FMB-DENR)
- 3,000 data collectors across 7,000 islands
- Seamless aggregation of patrol data from over 220 sites spanning provincial, regional, and national levels
- Faster & more effective -> Improved decision making



USAID FROM THE AMERICAN PEOPLE

Wildlife Insights

Camera Trapping with AI for Population Assessments

© S. Ramsay

Why Wildlife Insights?

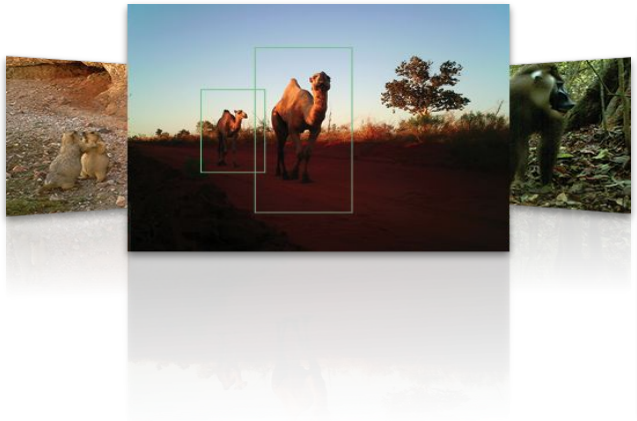
Goal

Provide wildlife professionals a software platform to identify, manage and analyze camera trap data to ***scale up wildlife monitoring and make data driven decisions.***

Deploy Field Sensors

Organizations deploy sensors (mostly camera traps) in situ

Upload | **Identify** | **Analyze**



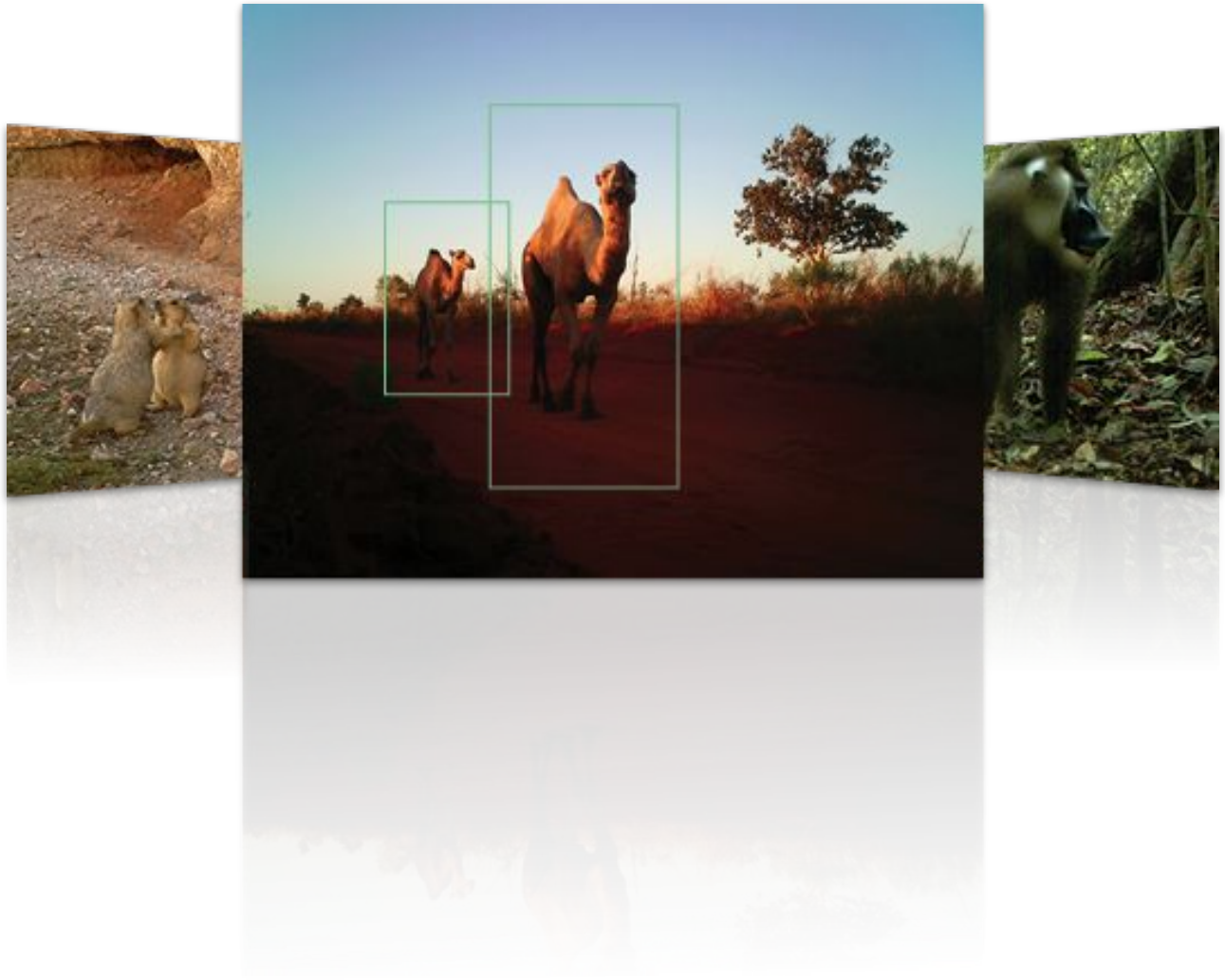
Images and metadata are uploaded to the Google Cloud, and AI identifies what's in the image. Analytics are automatically calculated.

Manage & Act

Reports are produced to demonstrate biodiversity due diligence and certification

Wildlife Insights: Key Features

- Upload images and metadata to cloud
- AI-assisted object detection and species identifications
- Data entry/ Expert review
- Automated analytics and report generation
- Supported by the Wildlife Insights Partnership



Key Features

Artificial Intelligence

- **993 species trained on 15M+ images**
- **Bounding boxes to detect objects in images**
- **Geographic filters**
- Leveraging sequential information

Analytics and Insights

- **Operational statistics**
- Basic population and activity analytics
- Community wide analytics (e.g., Wildlife Picture Index)
- Automatic report generation
- Spatially explicit products

Data input and management

- **Web-based data upload**
- **Tools to review and confirm identifications**
- **Batch upload of historical data**
- **API**
- Synced offline desktop solution

Collaboration and Sharing

- **Initiatives with custom websites**
- **Public page to explore projects**
- **Creative Commons licenses**
- **Endangered species safeguarded, no human images shared**
- **Embargo on projects**
- **Private data download**

Wildlife Insights Benefits

Save time and resources

- Blank detection
- Species classification suggestions
- Automated analytics*
- Digital management of data

Secured, accessible, backed up

- 4 year embargo + sensitive data obfuscation
- Cloud backup
- Access anywhere
- Share with collaborators

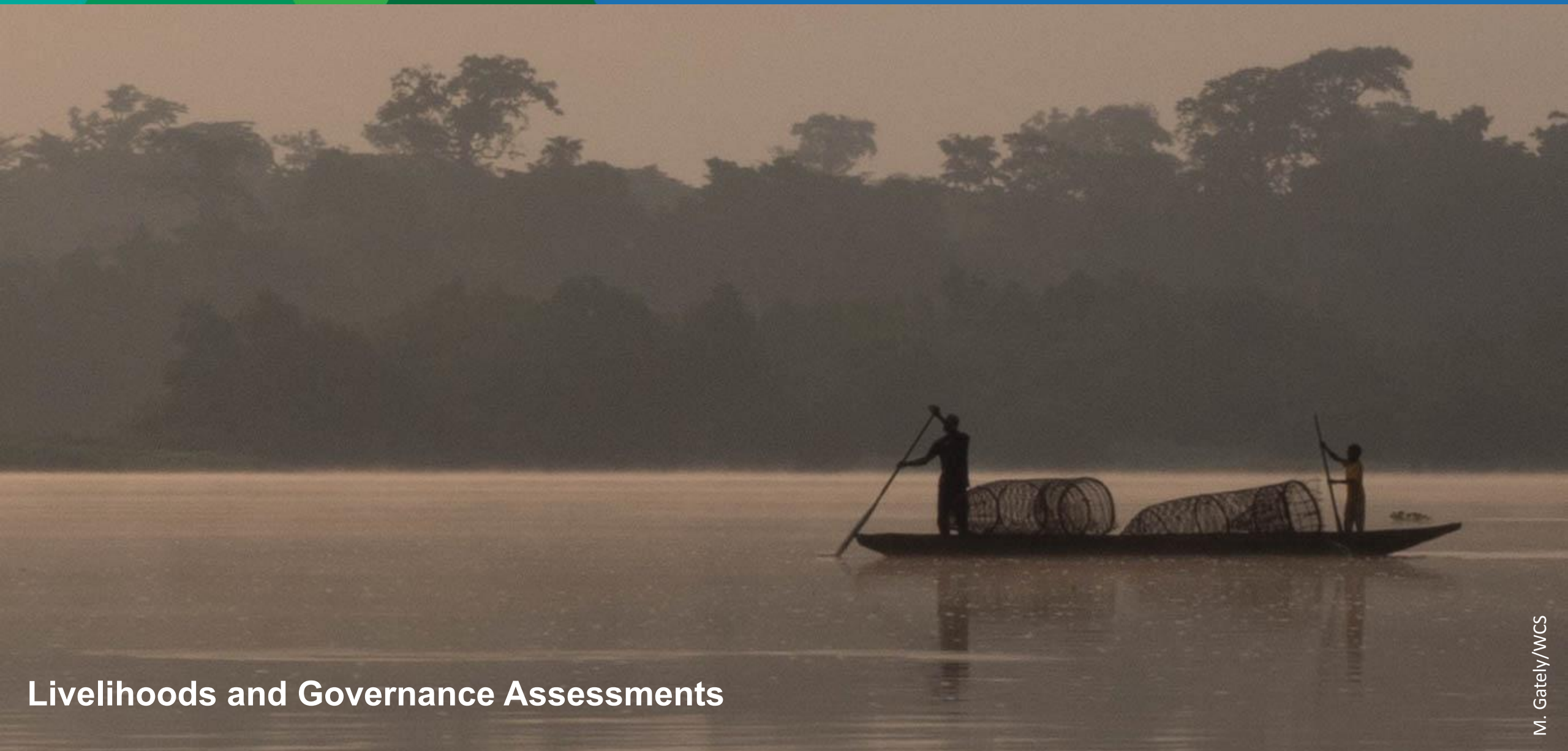
Promotion and recognition

- World's largest repository
- Clear attribution of contributors

Adopt best practices

- Data and other standards
- Proven reduction in errors

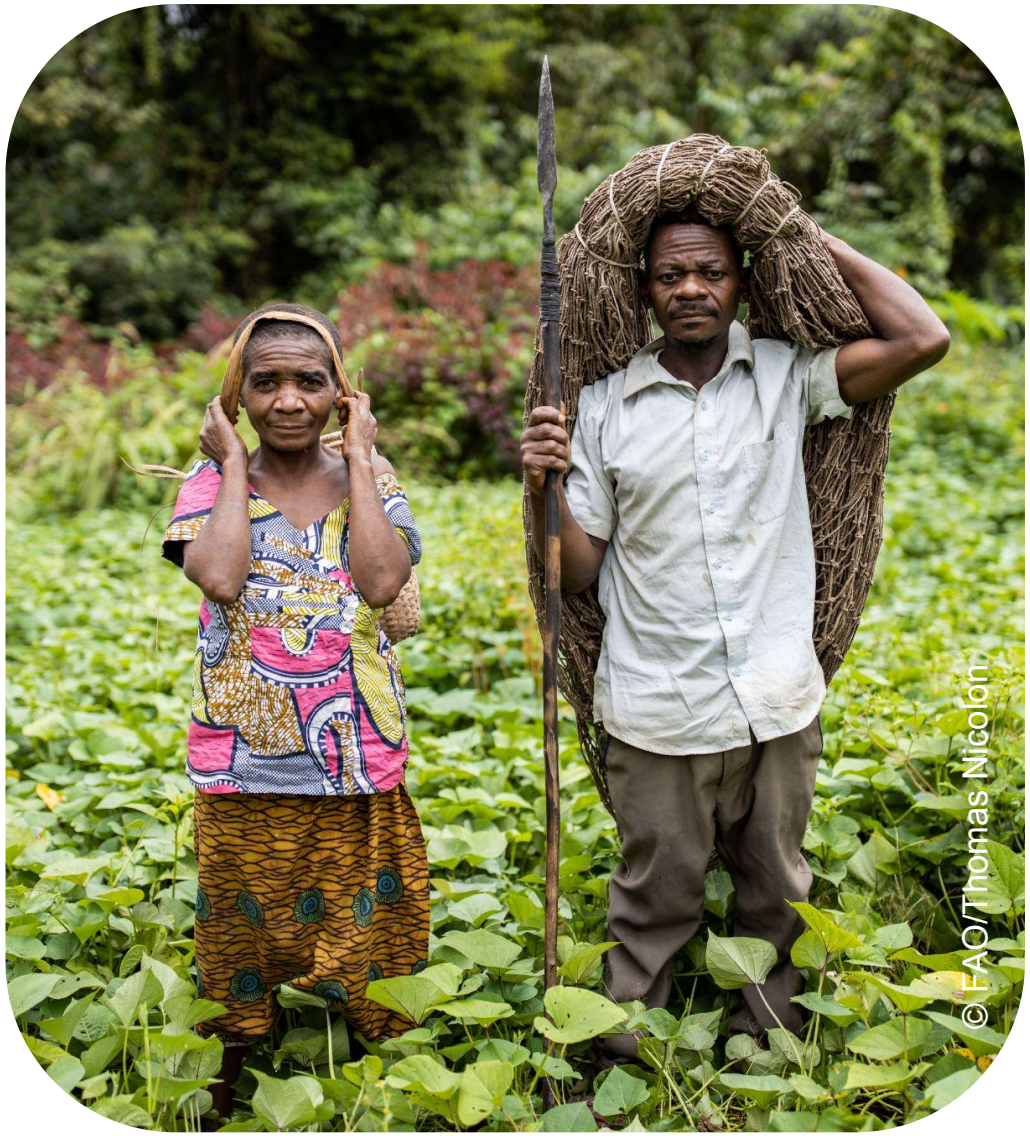
Basic Necessities Survey (BNS)



Livelihoods and Governance Assessments

M. Gately/WCS

Why is Monitoring Livelihoods and Governance Important?



- Basic Necessities Survey and Natural Resource Governance Tool allow to track changes in human well-being and local governance.
- Ensure we do no harm; assess and improve the impact of our interventions.
- Easy, cost effective and replicable tools, can be adapted to any context.

Theory and Practice 101

- **BNS : measuring well-being according to local perceptions**
- UN definition of poverty : « a lack of basic necessities »
- Assess if a household has, or has access to, necessary goods and services as defined by local communities.

- **NRGT: assessing local governance**
- Three governance attributes to assess how representative groups define rules and sanctions to ensure sustainable use of natural resources:
  - Authority
  - Capacity
  - Power

Monitoring Well-Being and Governance: Key Tools

- Focus groups and individual surveys
- Kobotoolbox to create forms, enter and manage data
- Analyse data in your preferred tool

BNS & NRGT: Benefits

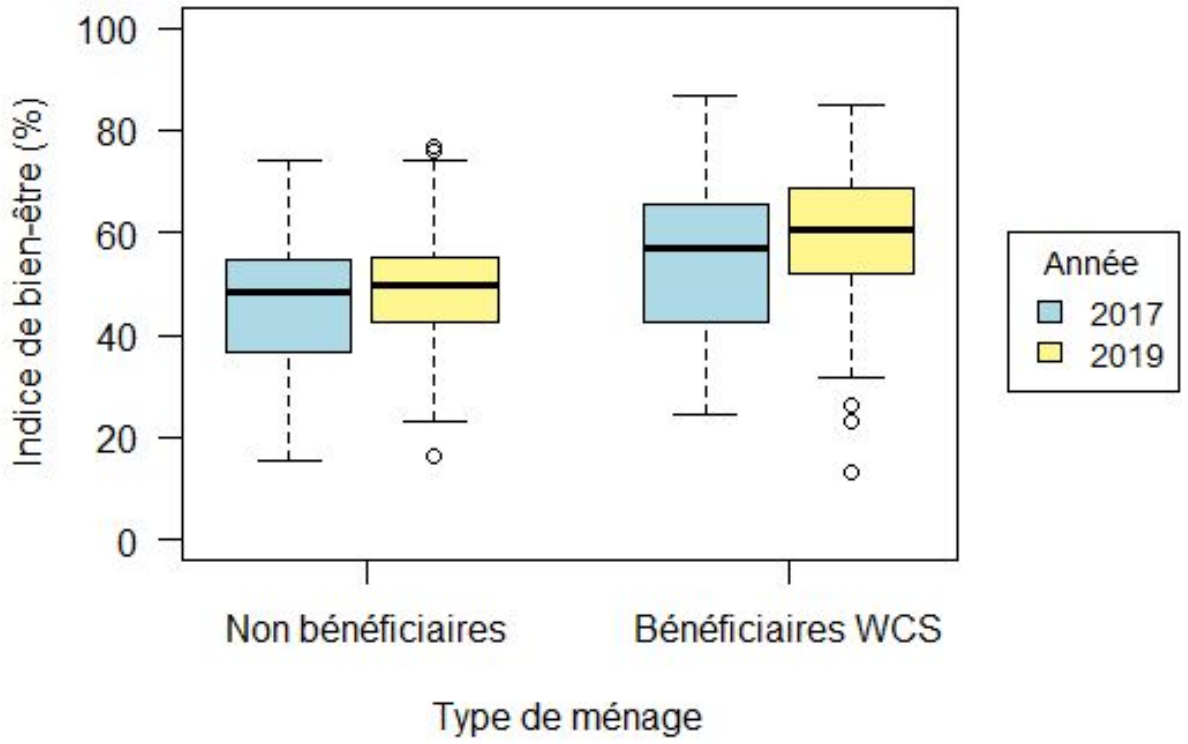
- Long-term, sustainable solutions to monitor human well-being and local governance
- Easy to implement and replicate, require few resources.
- Less intrusive than other poverty measures.
- Allows us to detect changes on short time period (2 years).
- Robust variables.

Case Study: Makira

BNS around Makira Natural Park, Madagascar

Well-being increased significantly from 2017 to 2019

- +4,9% in WCS beneficiary households;
- +2,5% for non beneficiaries.



KoboToolbox

Automated capture and analysis of survey and social science data

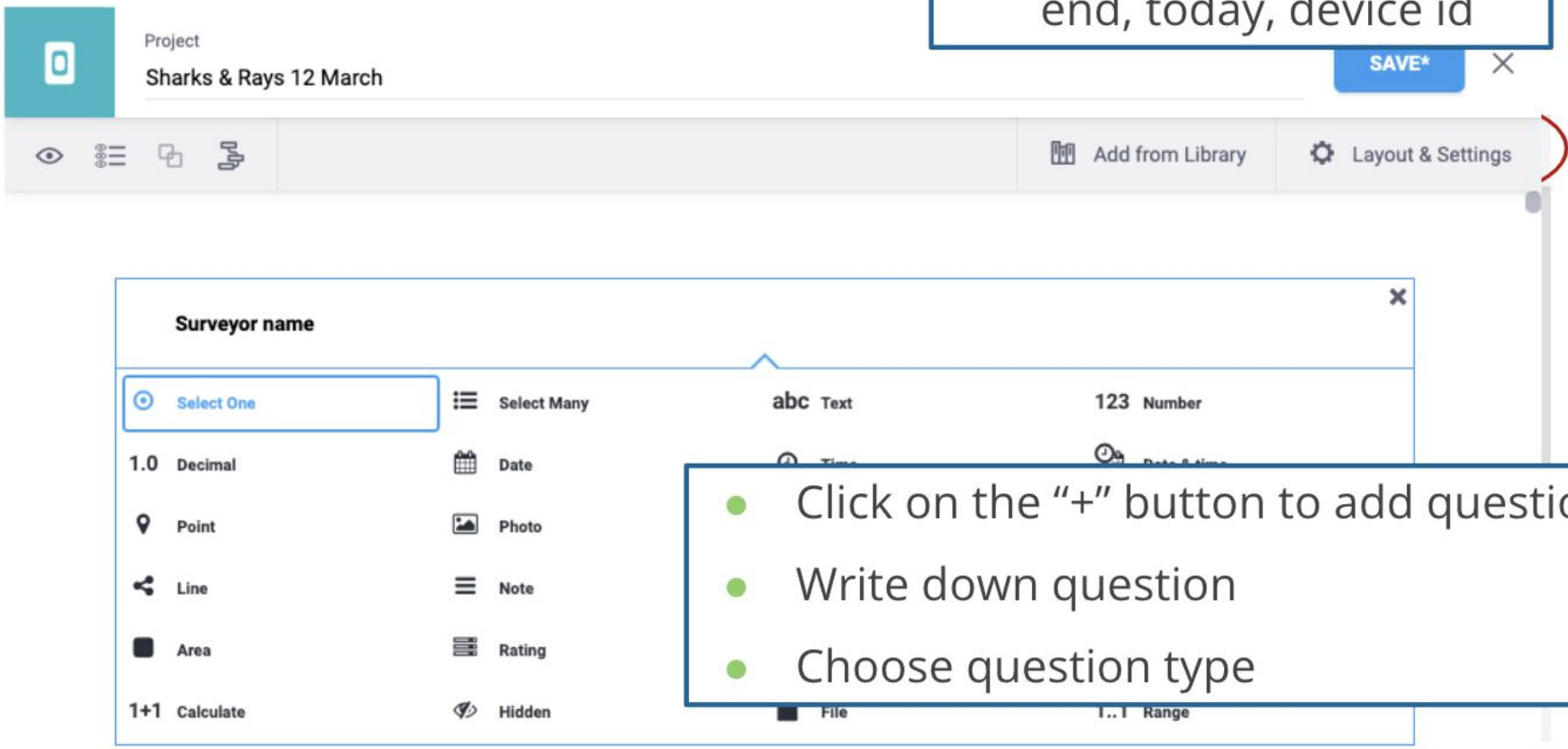
S. Ramsay

KoboToolbox

Create a form - online

On **kobotoolbox.org**

- Add metadata: start, end, today, device id

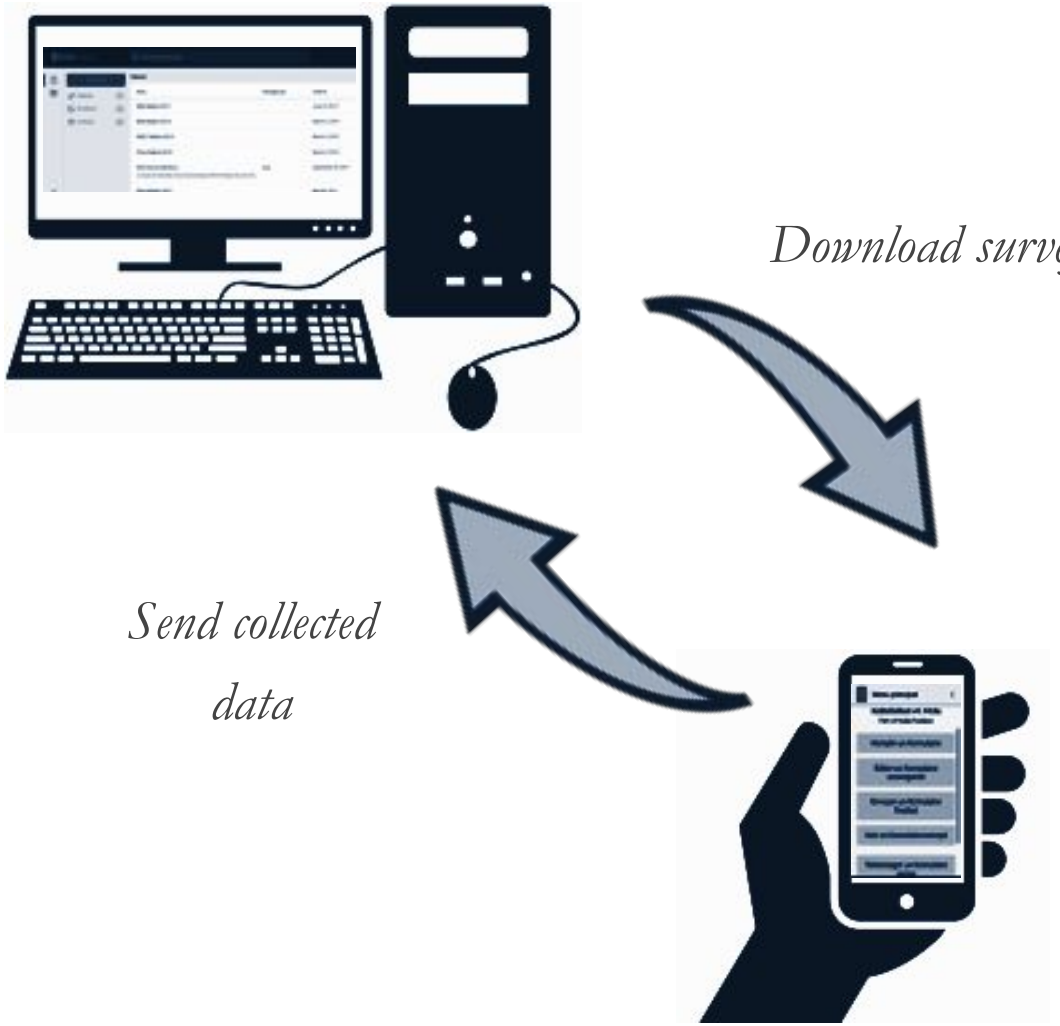


- Click on the “+” button to add question
- Write down question
- Choose question type

Why Use KoboToolbox?

- Digital data collection system
- Free & Open Source
- Reduces data collection errors and saves data entry time
- Multiple languages
- User-friendly
- Many users, ongoing improvements and good support
- Online/Offline data collection

Theory and Practice 101



KoboToolbox Internet Platform

- **Create**, **edit**, **deploy** forms
- **Store**, **verify**, **download** data

KoboCollect Application or **Enketo**

- **Download** survey forms
- **Collect** data: fill out forms offline
- **Send** data to the KoboToolbox internet platform

Kobotoolbox: Key Tools

- Kobotoolbox based on ODK language
- Forms can be open on any device:
  - Enketo web forms on internet browsers
  - KoboCollect application on android devices
- Create forms online (Kobo form builder) or offline (Excel)
- All types of questions accepted (text, number, choices, photos, recordings, GPS, etc…)

KoboToolbox: Benefits

- Free, open-source
- Very user-friendly, support and community forum
- Almost no mistakes in data collection if form well designed (drop-down lists, constraints…)
- Data collection = data entry
- Start analyses right after collection
- Data safer, unless equipment breaks
- Can be linked to online databases for cloud-based analyses

Case studies

- BNS & NRGT
- Sharks & rays catch information in East Africa
- Reforestation monitoring under Trillion Trees program
- Wildlife hunting, trade and consumption monitoring
- Grievance Redress Mechanism

Introducing Gundi

A universal adaptor for conservation technologies

- Free and open source
- Built by and for the global conservation community
- Single point of integration
- Support for the most used devices and applications
- Routing of data through external analyzers

How Gundi Helps


© Chris Walzer/ WCS

Sensor & AI Developers

Single integration >>multiple apps & deployments


© Lana MA¦èlle.

Protected Area Staff

Ready-to-use solution

Device independence

Data out of siloes


© Tony Lynam/ WCS

Application developers

Single point of integration >> access to 100+ sensors

Focus limited resources

Community feedback & support

ConsTech works when:

- Global/broad reach
- Community-owned & driven
- Free & open source / Affordable
- Supported by a global community
- Adapts to diverse organizational needs
- Long-term sustainability plan
- Blending latest innovations with tried & tested technology

Zafer Kizilkaya | MCS

Questions