



NATURE
METRICS
DNA-BASED MONITORING

eBioAtlas

Scaling up eDNA monitoring around the world

Dr Kat Bruce, Founder at NatureMetrics



@NatureMetrics

We are a leading eDNA company, providing data for impact assessment, restoration & conservation



ERM **AECOM** **WSP** **Jacobs** **National Trust** **Freshwater Habitats Trust**

THE BIODIVERSITY CONSULTANCY **HS2** **ANGLO AMERICAN** **bp** **REPSOL**

WCS **WWF** **FAUNA & FLORA INTERNATIONAL**

NATURE METRICS
DNA-BASED MONITORING

Legend:
● Conservation (green)
● Research (red)
● Impact assessment (orange)
● Statutory monitoring (yellow)
● Planning (blue)

Map Locations: U.S.A., SVALBARD, SWEDEN, BELARUS (future), GEORGIA, AZERBAIJAN, SERBIA, THE AZORES, CYPRUS, EGYPT, VIETNAM, MEXICO, NICARAGUA, COLOMBIA, SENEGAL, GUINEA, LIBERIA, UGANDA, TANZANIA, PERU, SIERRA LEONE, LIBERIA, SOUTH SUDAN (future), NAMIBIA, MOZAMBIQUE, SOUTH AFRICA, REUNION, AUSTRALIA.

80 employees

480+ Client orgs

End-to-end services for our clients

Sampling kits for use by non-specialists



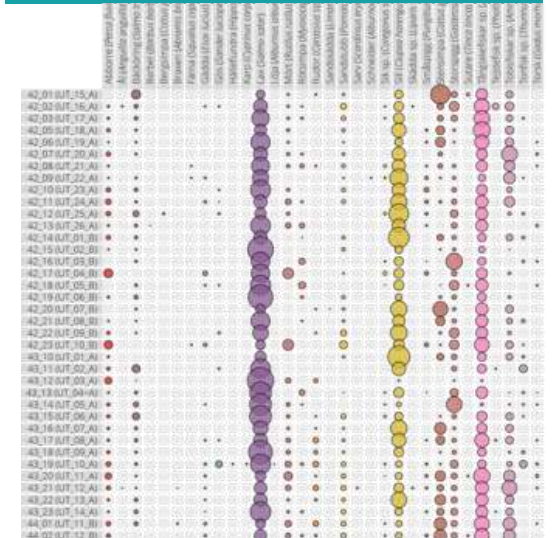
Decades of molecular laboratory experience



Robust and replicable bioinformatics



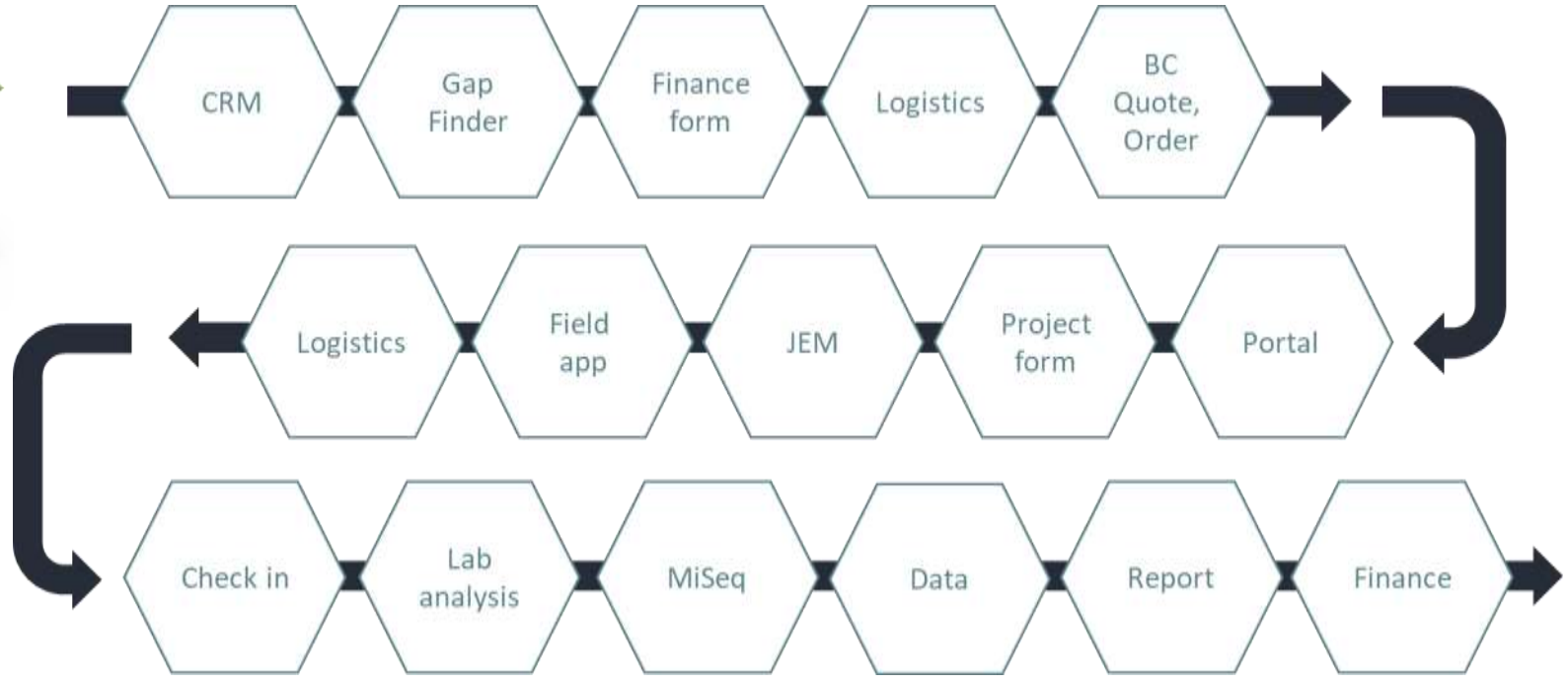
Professional tracking reporting system



The **Product Delivery Team** brings together people from teams across the business to ensure we deliver to a high standard.



NATURE METRICS		CRM SUMMARY	
Project Name	Project ID	Status	Priority
Project Name	Project ID	Status	Priority
Project Name	Project ID	Status	Priority
Project Name	Project ID	Status	Priority
Project Name	Project ID	Status	Priority
Project Name	Project ID	Status	Priority
Project Name	Project ID	Status	Priority
Project Name	Project ID	Status	Priority
Project Name	Project ID	Status	Priority
Project Name	Project ID	Status	Priority





RIVER DOLPHIN &
eDNA SURVEY IN THE
PERUVIAN AMAZON



Group	Species
Fish	375
Mammals	155
Amphibians	74
Reptiles	6
Birds	65



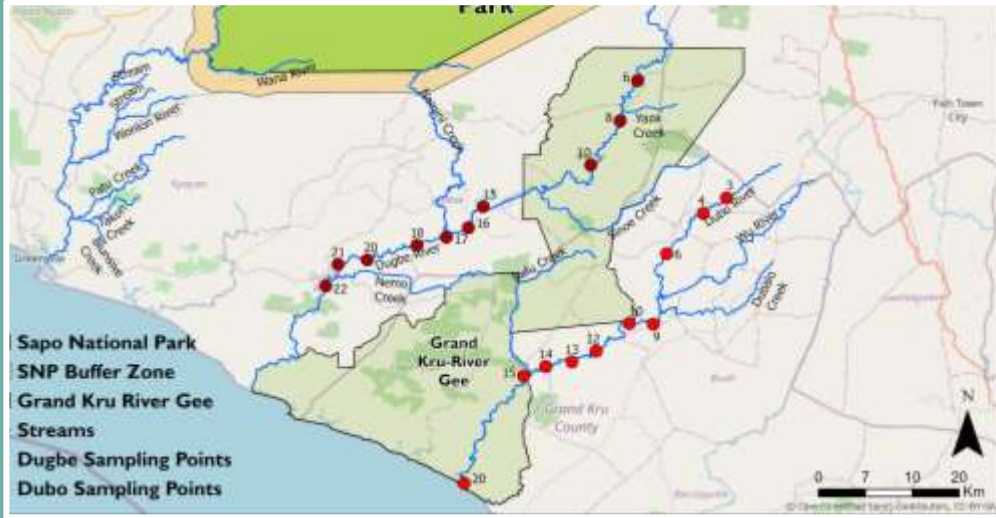


Testing the quality of data collected by citizen scientists

	Unwrapped					Wrapped				
	Emily	Jonny	Rozzy	Maia	Edwin	Mike	Tom	Jane	Kat	Kat2
European eel	•	•	•	•	•	•	•	•	•	•
Spined loach	•	•	•	•	•	•	•	•	•	•
Common bream	•	•	•	•	•	•	•	•	•	•
Gudgeon	•	•	•	•	•	•	•	•	•	•
Dace/Orfe	•	•	•	•	•	•	•	•	•	•
Bitterling	•	•	•	•	•	•	•	•	•	•
Roach	•	•	•	•	•	•	•	•	•	•
Chub	•	•	•	•	•	•	•	•	•	•
Tench	•	•	•	•	•	•	•	•	•	•
Stone loach	•	•	•	•	•	•	•	•	•	•
Northern pike	•	•	•	•	•	•	•	•	•	•
Ruffe	•	•	•	•	•	•	•	•	•	•
Perch/Zander	•	•	•	•	•	•	•	•	•	•
European bullhead	•				•	•				
Mallard/Common shelduck	•	•	•	•	•	•	•	•	•	•
Duck species	•	•	•	•	•	•	•	•	•	•
Dove species	•	•	•	•	•	•	•	•	•	•
Common moorhen	•	•	•			•	•	•	•	•
Grey heron						•				
Water vole	•	•	•	•	•	•	•	•	•	•
Cow	•	•	•	•	•	•	•	•	•	•
Dog	•	•	•	•	•	•	•	•	•	•
Human	•	•	•	•	•	•	•	•	•	•

Highlighted samples collected by expert for comparison

Freshwater eDNA in Liberia



Target: Pygmy Hippo
Analysis: Vertebrates



- Samples collected by park rangers after short training
- Presence of pygmy hippos confirmed at 10 locations

- 165 other vertebrate species detected (aquatic & terrestrial)
- New country record of Tai Toad

Near-threatened	6
Vulnerable	6
Endangered	5
Critically Endangered	1



Scriptophyosemion schmitti
Passed on to IUCN and may trigger a new KBA



Conservation and EIA projects across the region

Consistent data

- Combine, compare & replicate across projects & locations

Biodiversity 'by-catch' shared between organisations

- address multiple objectives & optimise use of conservation resources

Samples routinely collected by local stakeholders

- builds engagement & stewardship
- Scales-up monitoring





© Michel Roggo.

eBioAtlas

Mapping the world's biodiversity using environmental DNA

A PARTNERSHIP BETWEEN



AND

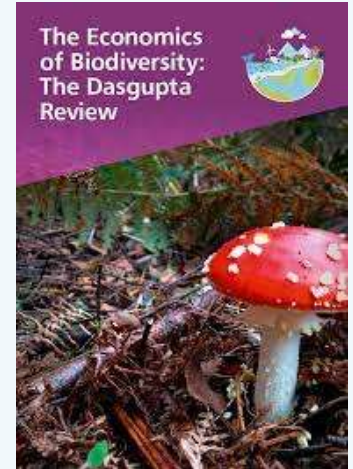
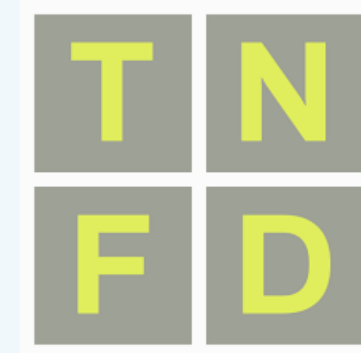


**NATURE
METRICS**
DNA-BASED MONITORING

BIODIVERSITY HAS A MEASUREMENT PROBLEM

Conventional surveys give patchy, inconsistent & incomplete data that is not fit for purpose

‘Gold standard’ data can be 100 years out of data





ENVIRONMENTAL DNA (eDNA)

30,000 samples
over 3 years



FILTER



FILTER



PRESERVE



SEND





EAST LONDON



MALAYSIA



SOUTH AFRICA

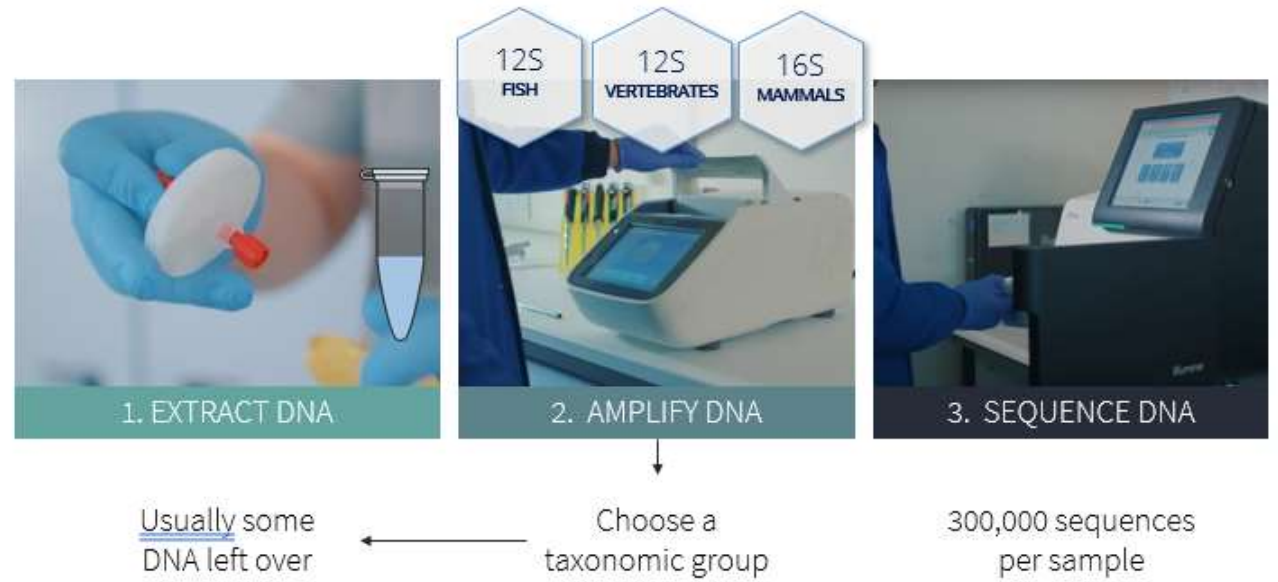




Convention on
Biological Diversity

Global
Biodiversity
Framework





\$15 M will fund:



30,000 eDNA samples



Global reference library



Equip local stakeholders



Digital infrastructure



Open data



Sustainable financing



eBioAtlas TEAM

IMPLEMENTATION

RESEARCHERS

BUSINESSES

PUBLIC

GOVERNMENTS

Conduct field sampling

Large international organisations
as implementing partners



Smaller, local organisations
as part of wider regional networks





eBioAtlas TEAM

IMPLEMENTATION

RESEARCHERS

BUSINESSES

PUBLIC

GOVERNMENTS

Conduct field sampling

Large international organisations
as implementing partners



Smaller, local organisations
as part of wider regional networks





eBioAtlas TEAM

IMPLEMENTATION

RESEARCHERS

BUSINESSES

PUBLIC

GOVERNMENTS

eDNA scientists can **add samples & data** to eBioAtlas as a route to impact for science & conservation

Access eBioAtlas data
for research





eBioAtlas TEAM

IMPLEMENTATION

RESEARCHERS

BUSINESSES

PUBLIC

GOVERNMENTS

Sponsor sampling opportunities
in specific areas / river basins

Add site-based eDNA monitoring
data from EIA as part of the
eBioSite programme





eBioAtlas TEAM

IMPLEMENTATION

RESEARCHERS

BUSINESSES

PUBLIC

GOVERNMENTS

Community science programmes





eBioAtlas TEAM

IMPLEMENTATION

RESEARCHERS

BUSINESSES

PUBLIC

GOVERNMENTS

Integrate eBioAtlas data into
national biodiversity strategies



Digital infrastructure



Securely store & curate data

- Sample info & metadata
- Quality control data
- Raw sequence data
- OTUs / ASVs

Label data & metadata

Integrate bioinformatics

Link to reference databases

Implement confidence thresholds



eBioAtlas

OUR VISION

By empowering local stakeholders to **monitor biodiversity** at previously unimaginable scales, we **address global knowledge gaps** and lay the **foundations** for meeting global goals on nature & biodiversity.