APPLICATIONS OF EDNA TECHNOLOGY FOR IMPROVED EIA AND CONSERVATION OUTCOMES

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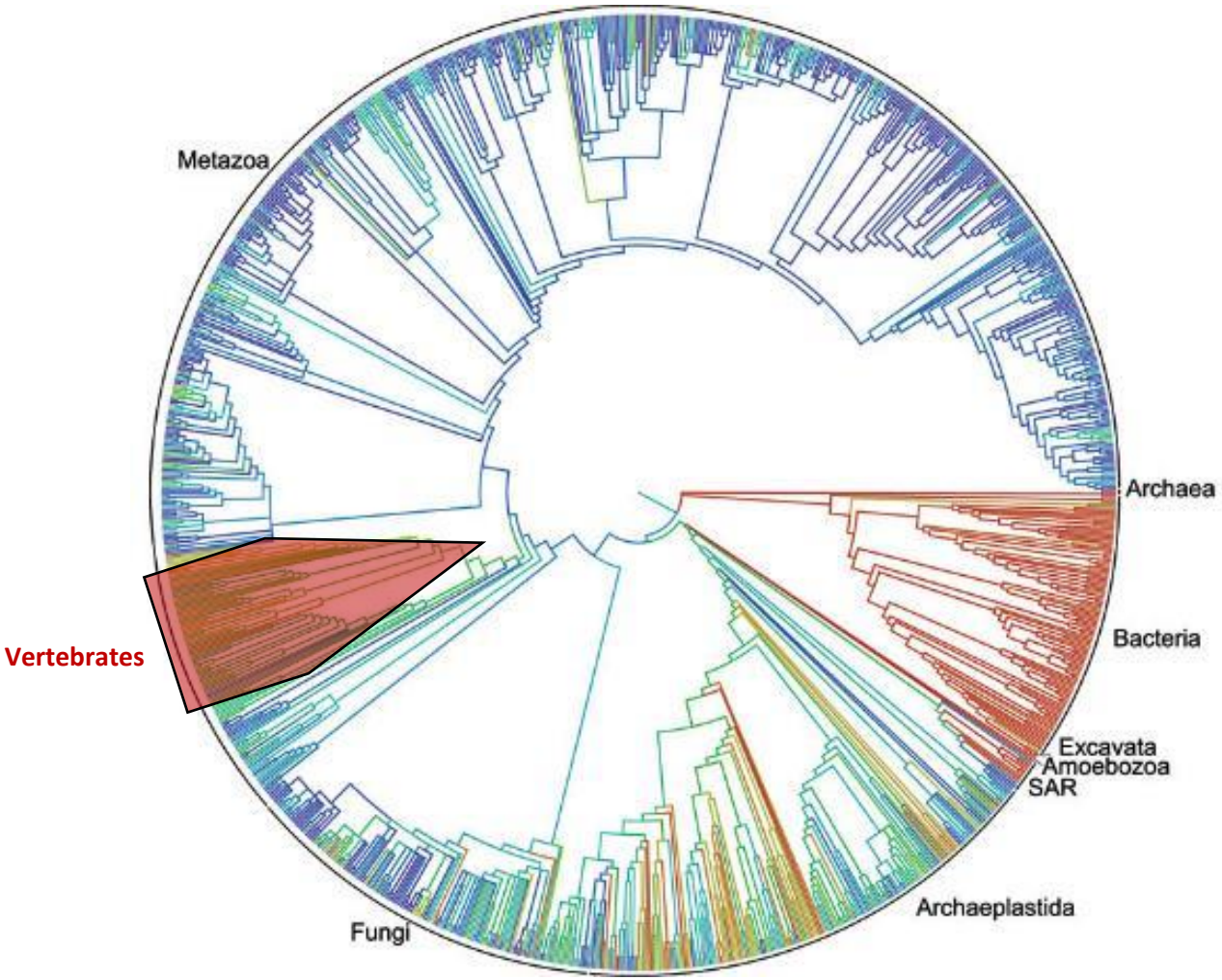
In 2021 business and finance woke up to **the need to monitor impacts** on nature

NATURE METRICS
DNA-BASED MONITORING

But biodiversity has a **measurement** problem

Biodiversity is much more complex than carbon

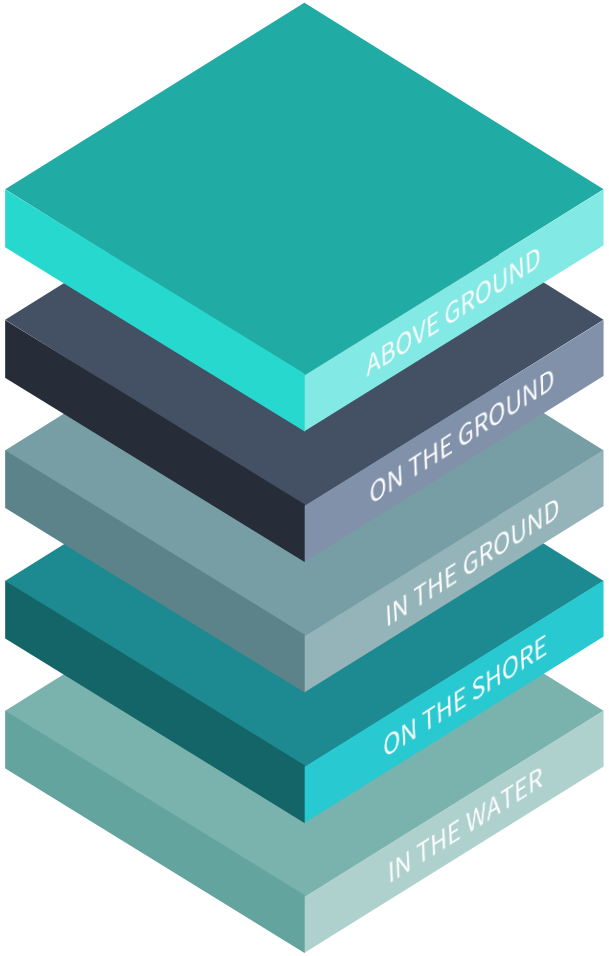
Meaningful metrics must simplify complexity…..not by-pass it altogether



NATURE METRICS
DNA-BASED MONITORING

ENVIRONMENTAL DNA (eDNA)

- Animals shed cells containing DNA as they move (skin, mucous, faeces, urine) through environments
- Cells with DNA enters water courses
- This is environmental DNA (eDNA)
- eDNA in the water remains detectable for hours to few days
- The eDNA can be captured & used to survey species.



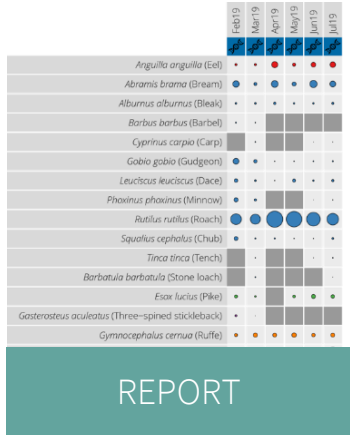
Insects
Vertebrates

Soil fauna
Bacteria
Fungi

Vertebrates
Invertebrates
Mussels
Bacteria

FILTER

ANALYSE



REPORT

NATURE METRICS
DNA-BASED MONITORING

WHAT eDNA CAN ACCOMPLISH

Limitations can be addressed through efficient study design*

LIMITATIONS

- Not possible to count (R&D in progress)
- No age or size data
- Incomplete reference databases*
- Spatial uncertainty*
- Lack of standardization*

ADVANTAGES

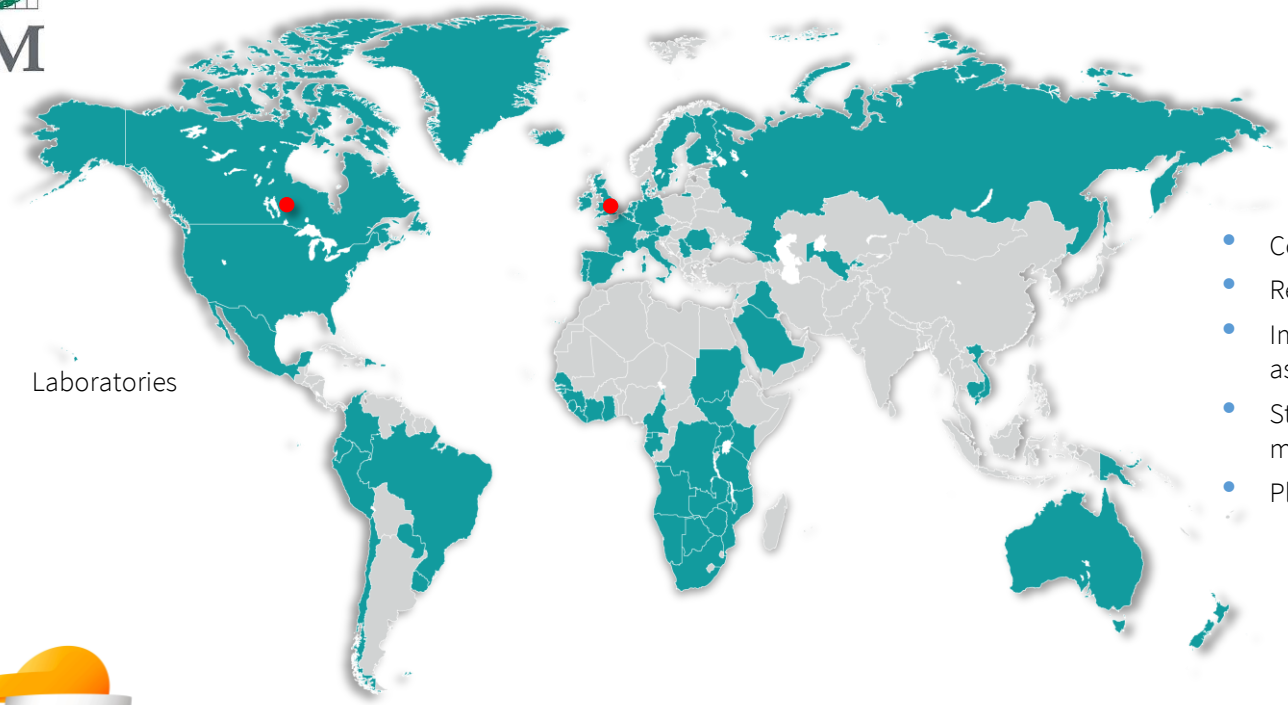
- Large datasets for NPI & monitoring
- Reduced cost & HSE risks in field
- Detect cryptic & elusive species
- Works in terrestrial environs & all water
- Methods are non-invasive
- Can be used by anyone

NATURE METRICS
DNA-BASED MONITORING

WHO WE ARE

NATURE METRICS
DNA-BASED MONITORING

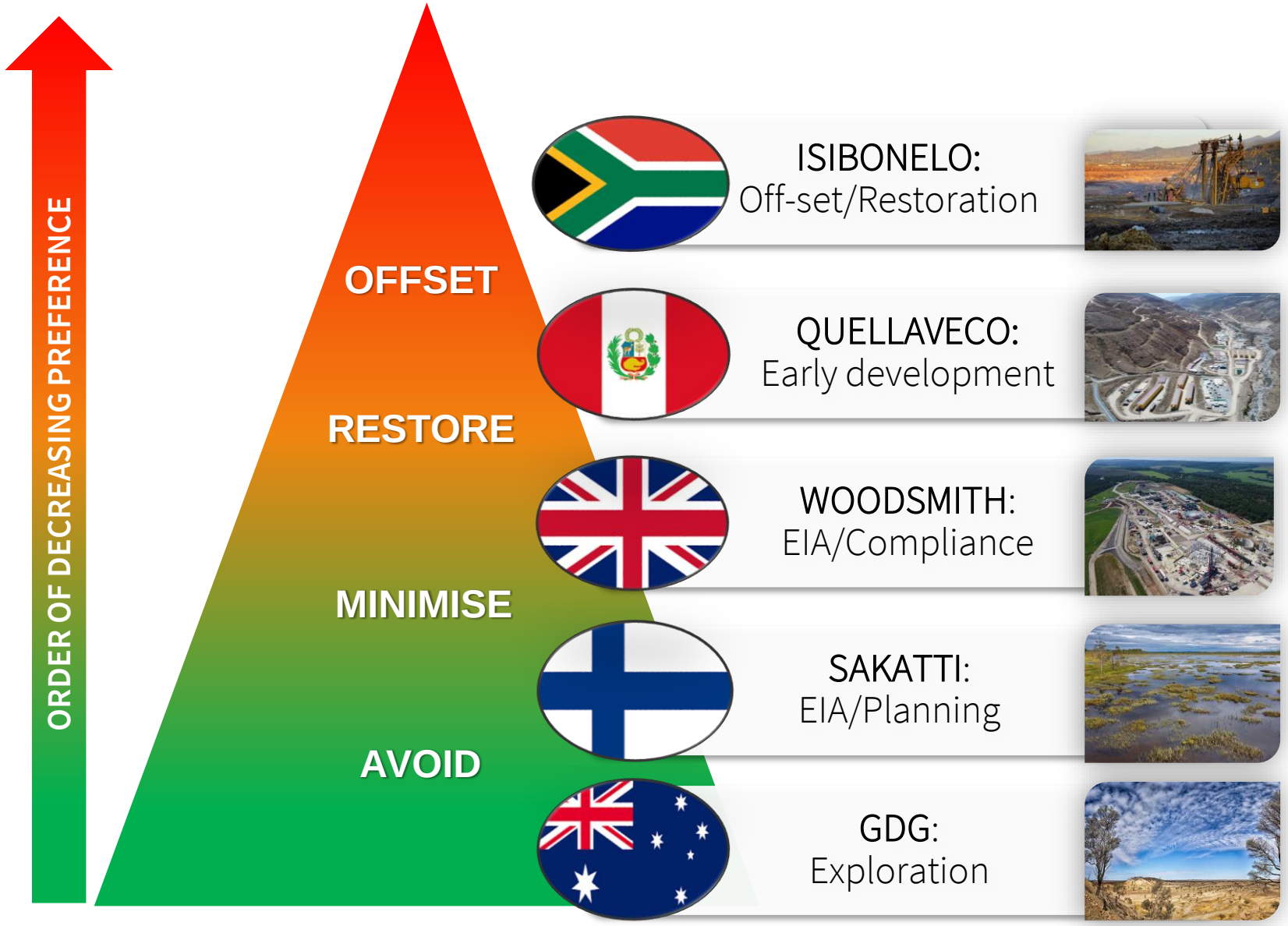
ERM
AECOM
BARRICK
Jacobs
National Trust
THE BIODIVERSITY CONSULTANCY
FAUNA & FLORA INTERNATIONAL
AngloAmerican
Freshwater Habitats Trust
bp
REPSOL
WCS
WWF



- Conservation
- Research
- Impact assessment
- Statutory monitoring
- Planning

~110 employees 450+ client/projects 65+ countries

eDNA INFORMS ALL STAGES OF THE MITIGATION HIERARCHY



AngloAmerican

- Early surveying to **develop baseline** for the project
- **Monitoring to track changes** in the nature and the extent of the impacts on biodiversity
- Prior to intervention **planning for restoration and offset**, measure biodiversity and then track changes to monitor progress in species and habitat recovery.

NATURE METRICS
DNA-BASED MONITORING

iNPI: INTELLIGENT NET POSITIVE IMPACT

Many companies compensate for simple approaches to delivering No Net Loss and Net Positive claims by using large offset areas. We are proposing a practical but sophisticated approach that embraces the complexity of biodiversity as an asset rather than a complication.

SAMPLING

Survey design and eDNA sampling

NatureMetrics designs an optimized, cost-effective sampling plan, drawing on any existing survey work and consultant knowledge.

MAPPING

Biodiversity landscape mapping

eDNA point samples are combined with Earth Observation data to create a continuous map of biodiversity, allowing efficient comparisons across the landscape surrounding the impact area.

RANKING

Identification of biodiversity values across the landscapes

Units of the landscape are scored and ranked. Stakeholder interests and landscape features are incorporated. Following valuation targets are set for the minimum biodiversity score landscape units must reach to count towards NPI.

RESTORING

Site restoration and offset planning

The map and site rankings can be used to avoid high-biodiversity-value areas (Avoidance and Minimisation) and to plan an efficient set of restoration actions and offsets to create sufficient landscape area of increased biodiversity value to achieve NPI

MONITORING

Measurement of NPI success

Year-on-year progress is tracked. Once a unit has reached the target biodiversity value it is added to the NPI balance. When the NPI balance is greater than the area of impact, success can be reported.

NATURE METRICS
DNA BASED MONITORING

‘BIG DATA’ FOR ECOSYSTEM HEALTH METRICS

- **Ecosystem mapping** for strategic biodiversity planning & achieving No Net Loss / Net Gain
- **Define indicators** from the wider spectrum of biodiversity as well as lower trophic levels, now accessible through eDNA
- **Track restoration** progress and implement adaptive management practices

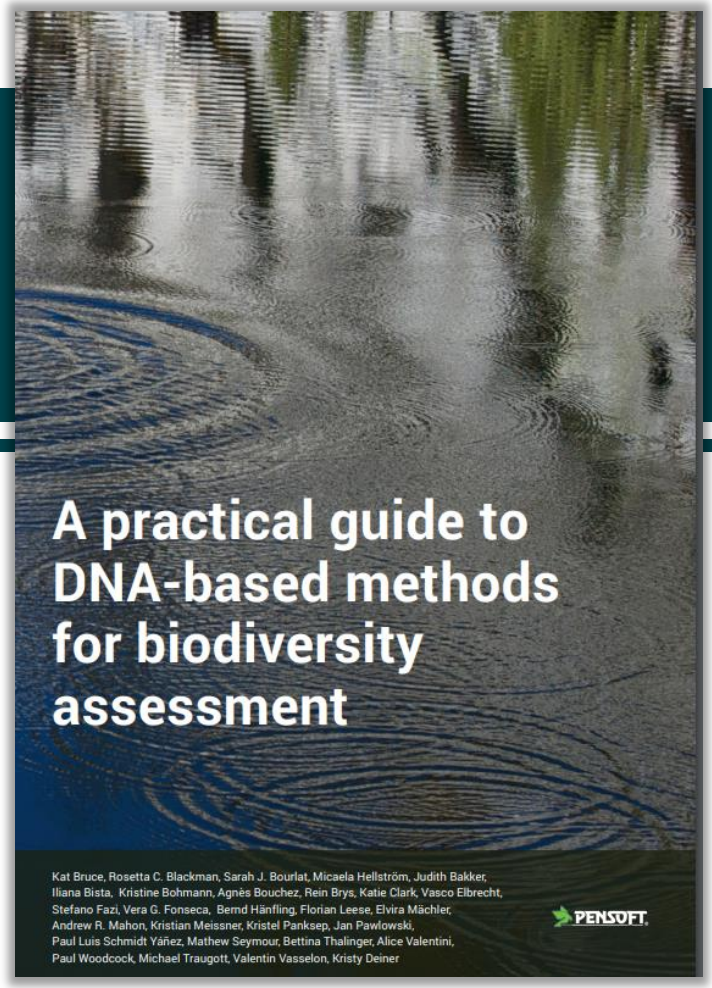
NATURE METRICS
DNA-BASED MONITORING

INDUSTRY GUIDANCE

THE BIODIVERSITY CONSULTANCY

Stantec

bp



USING EDNA TO DRIVE
NATURE POSITIVE OUTCOMES

Inclusion of eDNA in Project ToR's

Financial incentives

Improved Stakeholder engagement using eDNA

Transparent & Objective Record Keeping

Curated Open-access biodiversity data

Key drivers for a data-driven approach to

biodiversity monitoring

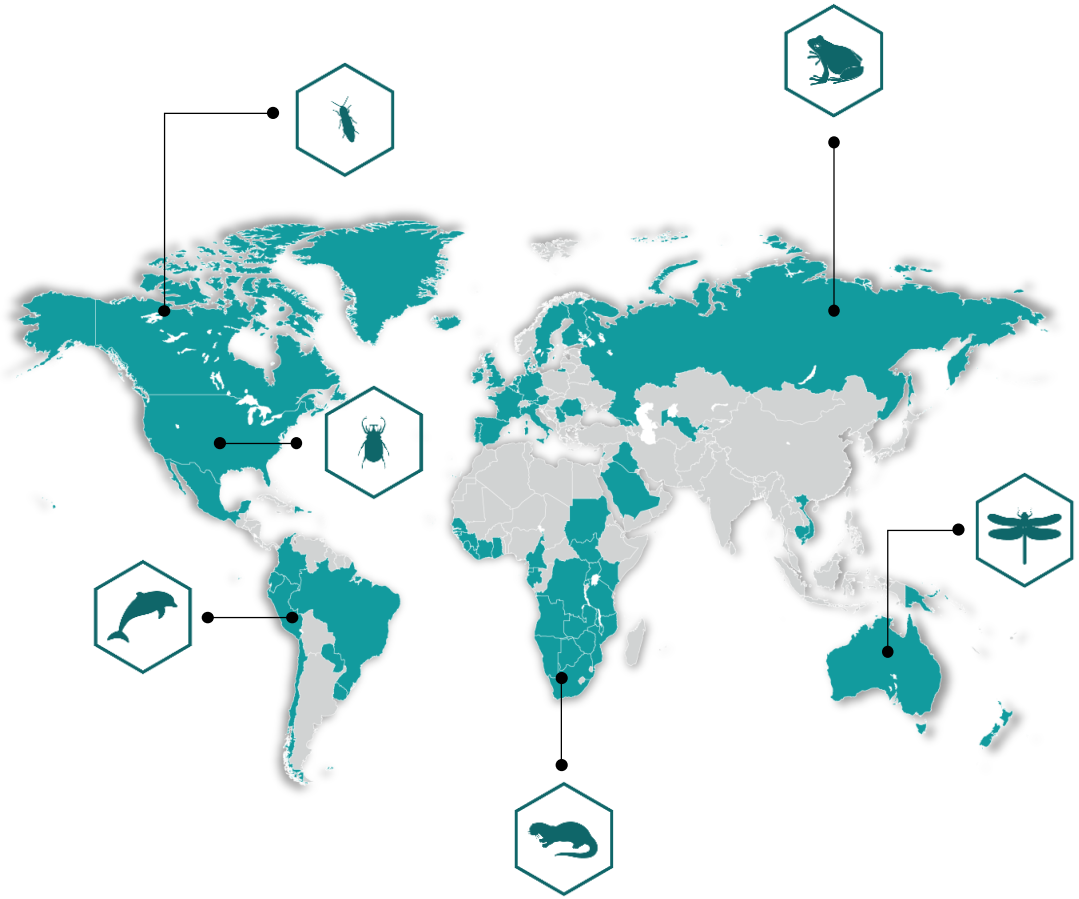
NATURE METRICS
DNA-BASED MONITORING

eBioAtlas

www.ebioatlas.org

A global map of biodiversity to address global knowledge gaps and lay the foundations for setting and meeting global goals on nature & biodiversity.

- **30,000 eDNA samples**
- **Equip local stakeholders**
- **Open Data**
- **At-cost sample analysis**
- **Digital Infrastructure**
- **Sustainable financing**



Implementing partner

Funding partner

Business partners

Let’s continue the conversation!

Post questions and comments via chat in the IAIA22 platform.

#iaia22

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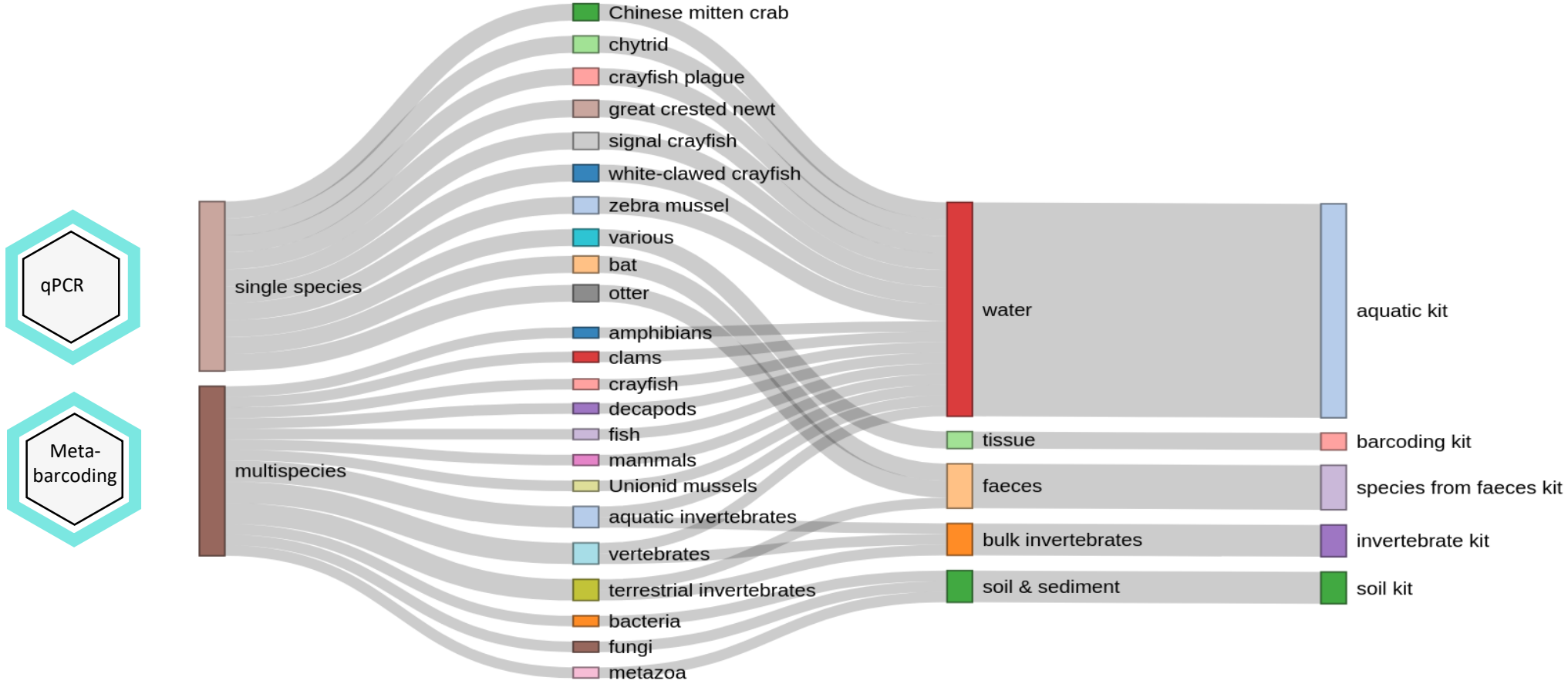
WHAT CAN BE DETECTED?



ANALYSIS TYPES | **TARGET** | **SAMPLE TYPE** | **iDNAture** SAMPLING KITS

It is possible to target a range of taxa from a single kit type and you can either choose to target a single species (qPCR) or multi-species (metabarcoding).