EUROPARC Webinar

23 February 2024
11:00 CET

Digital solutions to natural challenges

New tools to monitor and gather data in the field of Protected Area Management

Organised by:

EUROPARC FEDERATION

LIFE ENABLE

EUROPEAN NATURE ACADEMY

E.C.O. Institute of Ecology

Co-funded by the European Union.
Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

Photo: E.C.O.

europarc.org/europarc-webinars

BioMONITec

Biodiversity Monitoring Technologies Test, Development and Transfer of disruptive engineering technologies into conservation practice

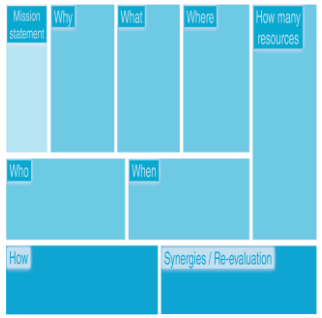
Vanessa Berger

Federal Ministry
Republic of Austria
Labour and Economy

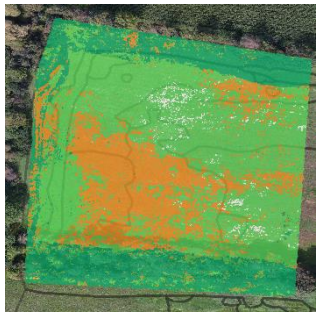
FFG
Promoting Innovation.

KÄRNTEN
UNESCO Chair on
Sustainable Management
of Conservation Areas

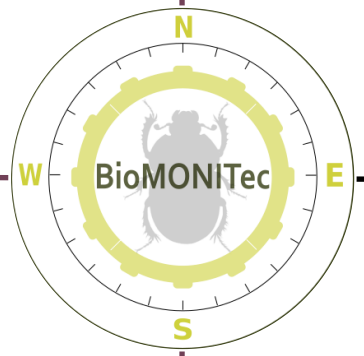
BioMONITec



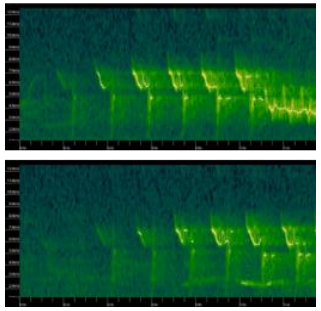
E-Toolkits



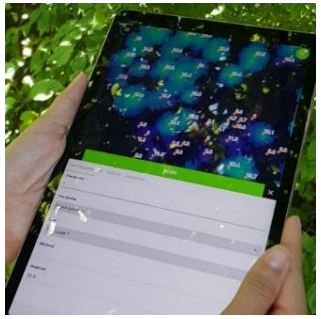
Outreach



MoniGloG



MoniConfiG



BioMONITEc *This project is funded by the FFG (**COIN** "Aufbau" (capacity building) funding line) - www.ffg.at*

Federal Ministry
Republic of Austria
Labour and Economy

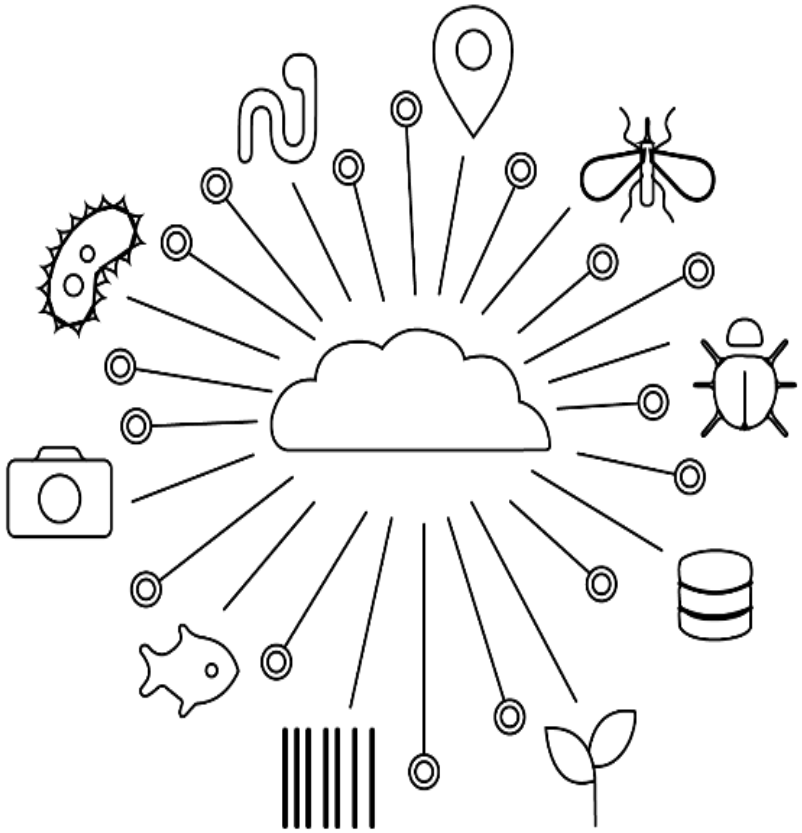
FFG
Promoting Innovation.

Remote sensing

- Satellite remote sensing
- Mid-range remote sensing (aerial photography)
- Close-range remote sensing (unmanned aerial vehicles, drones, photogrammetry)

Applied data science

- Big data, data science, data intelligence
- Artificial intelligence
- Geoinformatics, geostatistics
- Sensorics, network engineering



Advanced genetic methods

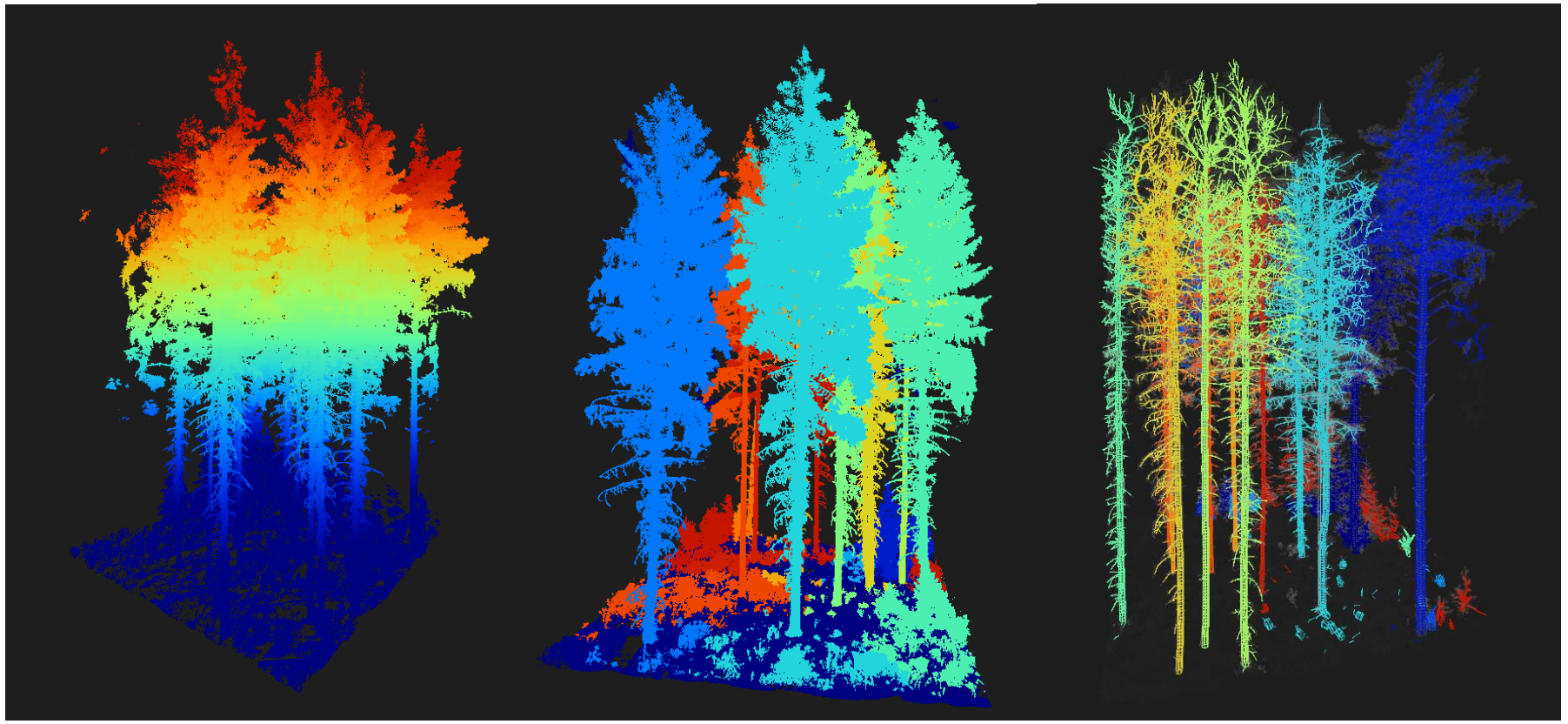
- Barcoding and metabarcoding of bulk samples
- eDNA (genetic analysis of environmental media, e.g., water or soil)

Automated recording units

- Camera traps
- Autonomous sound recorders
- Transmitters, data loggers

Apps and platforms

Adapted from Dalton, D., Chaudhary, S., Jungmeier, M., Adams, V., Berger, V., Botha, J., Halloy, S., Hart, R., Kirchmeir, H., Švara, V. et Torres-Ribeiro, K. (2024). A Framework for Monitoring Biodiversity in Protected Areas and OECMs - concepts, methods, and technologies. IUCN WCPA.

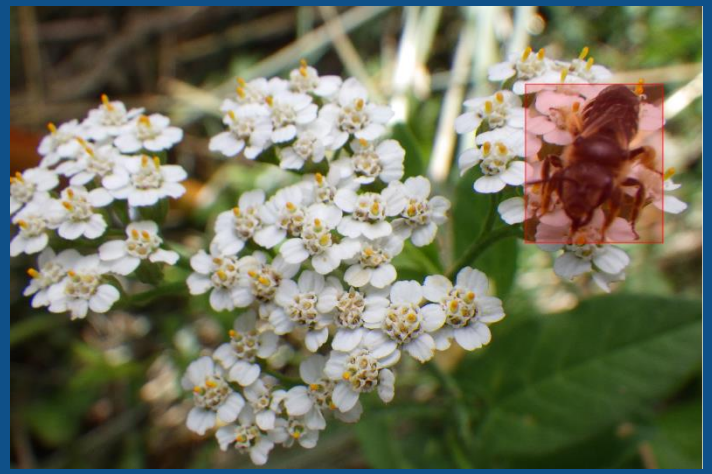


Digital Twins of Ecosystems

unesco
Chair

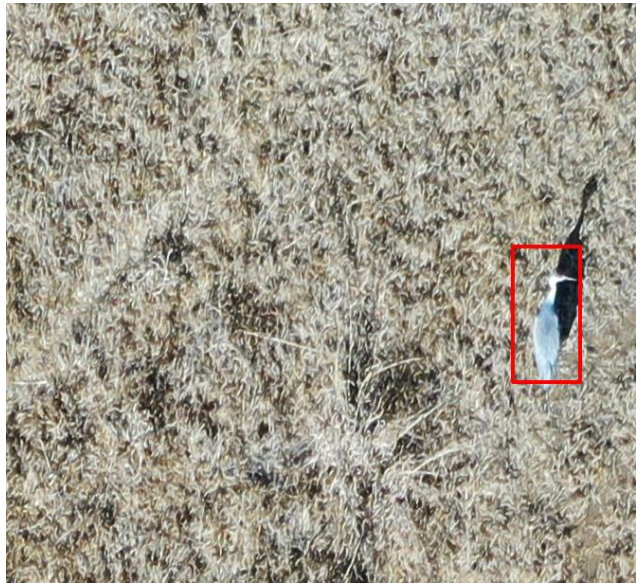
Image Recognition

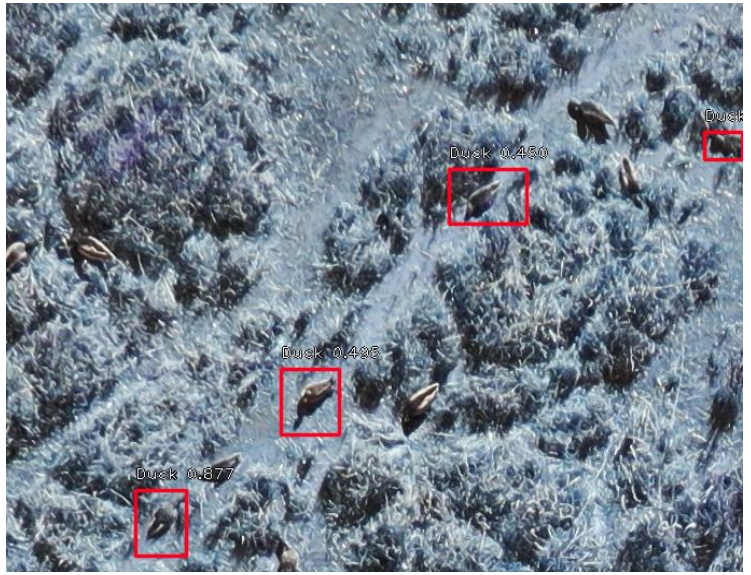
unesco
Chair



- **Data Acquisition**
  - Data overview and Taxonomy
- **Data Annotation**
  - LabelBox setup
  - LabelBox Guide
  - Annotation Progress
- **AI**
  - Pre-processing
  - AI Training
  - AI Validation
- **Deployment**
  - AI model use in real-word
  - Maintanance and Monitoring

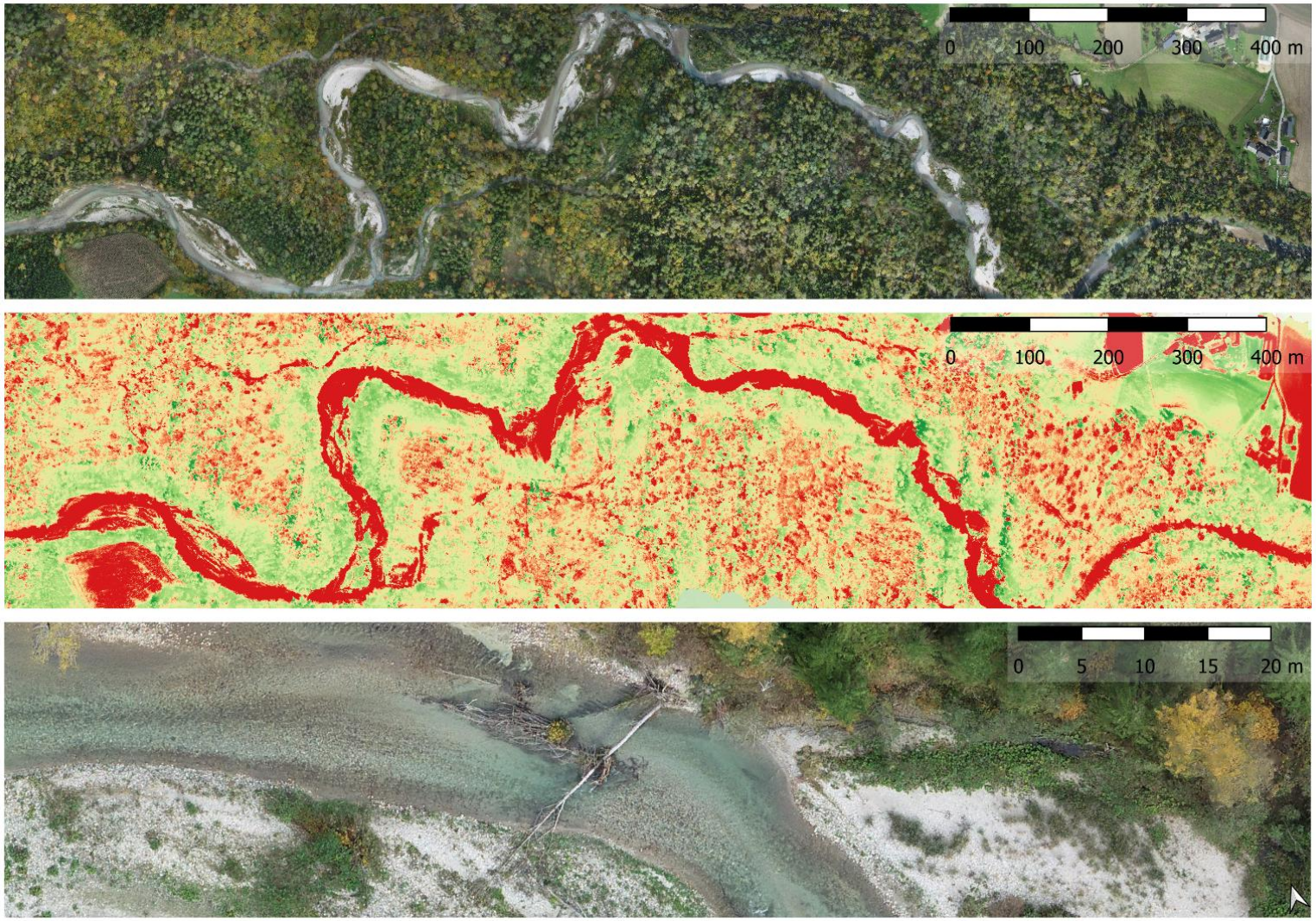
AI in Nature Conservation





Source: Mohammad Sadoun

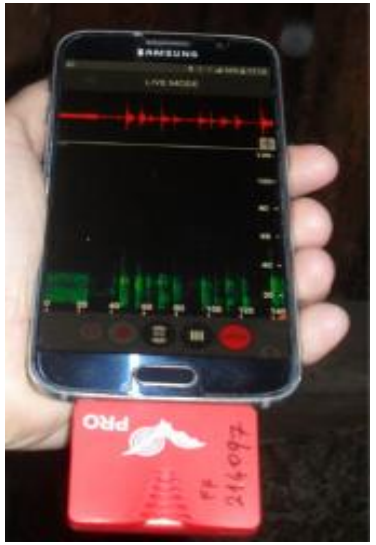
SIENA
Spatial Informatics for
ENvironmental Applications

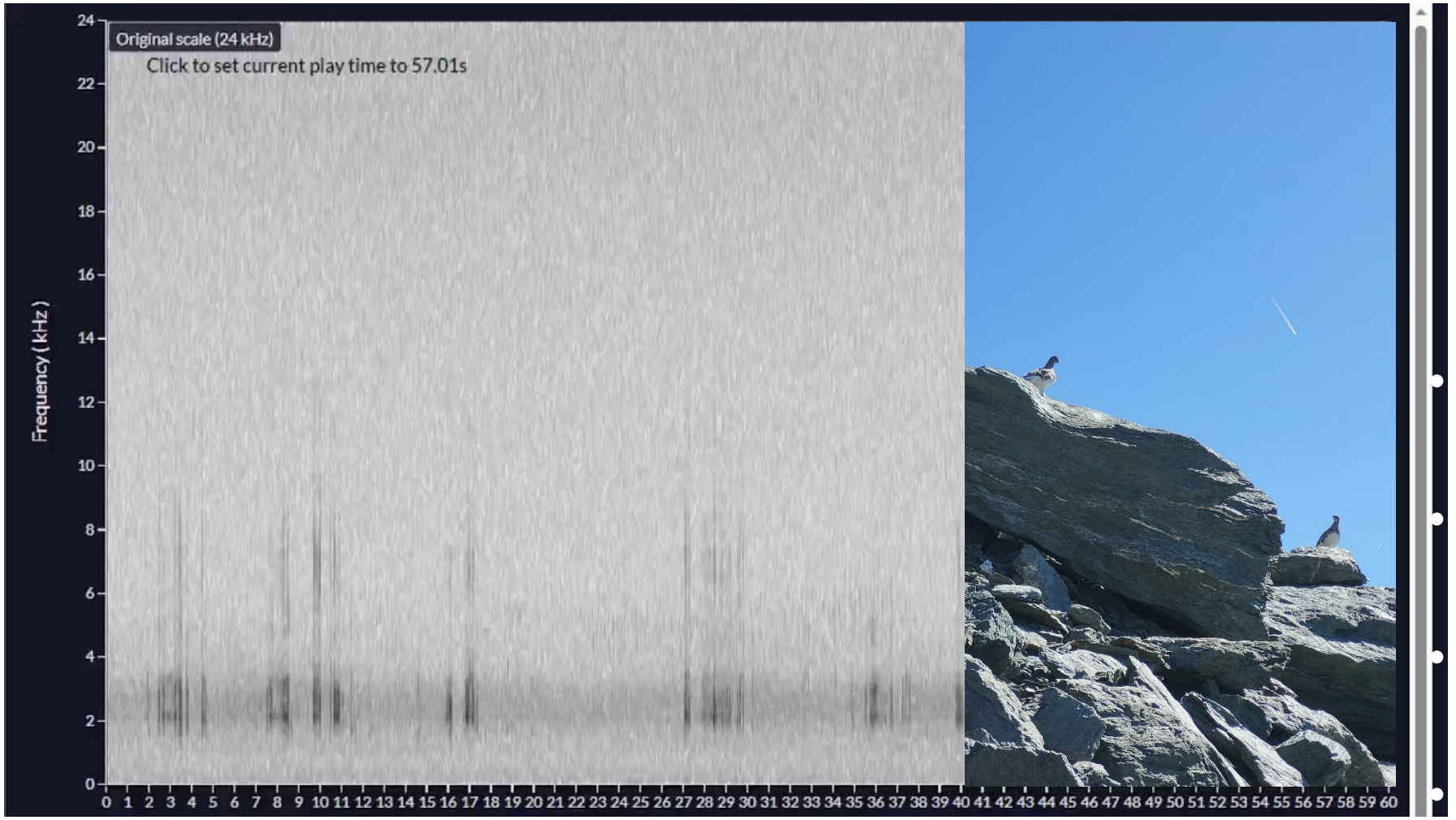

0 100 200 300 400 m
0 100 200 300 400 m
0 5 10 15 20 m

KÄRNTEN
UNESCO Chair on Sustainable Management of Conservation Areas

Photogrammetric based 3D Digital Twin

Acoustic Monitoring





Ptarmigan Monitoring

Arbimon

Nationalpark Hohe Tauern

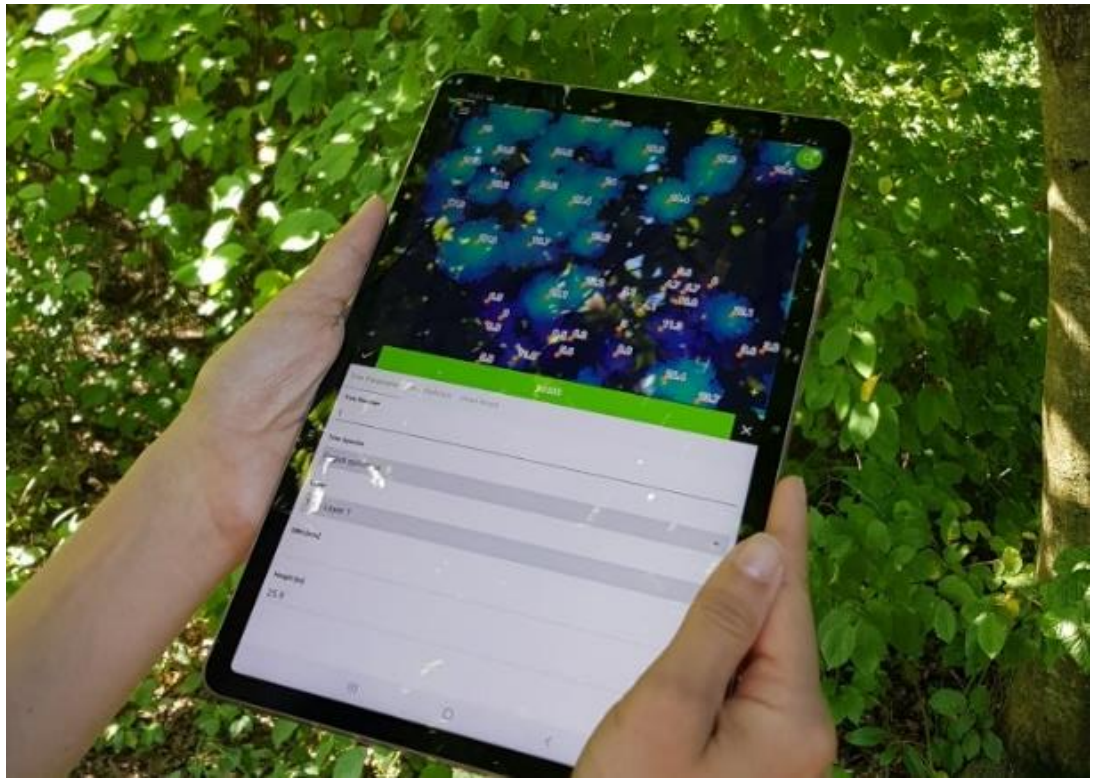
5 Audiomoth: 10.770 data sets, 188 GB

4 SongMeter Mini: 811 data sets, 136 GB

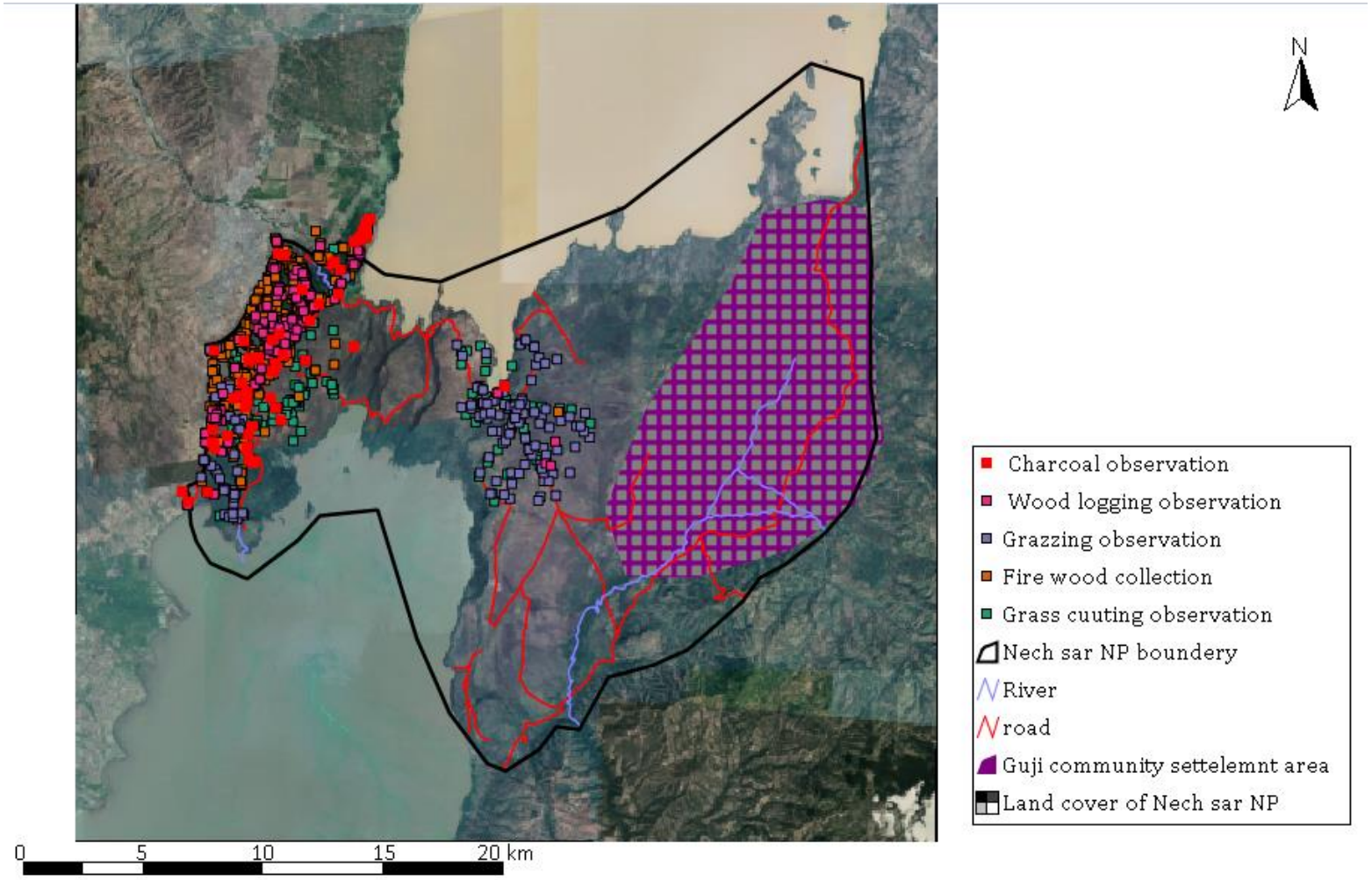
24. May – 20. June 2023

unesco Chair

Near-Real-Time Digital Data Assessment



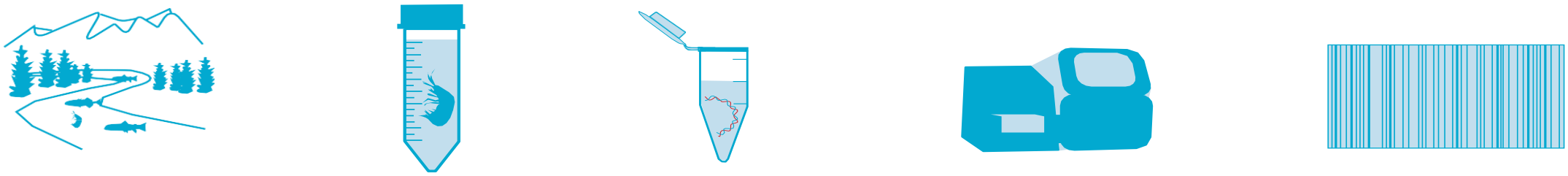
Spatial Monitoring and Reporting Tool (SMART)



In preparation: Tamirat Haile, Zerubabel Worku, Dereje Abera & Vanessa Berger: Application of Spatial Monitoring and Reporting Tool (SMART) for Improving Law-Enforcement Effectiveness at Nech Sar National Park, Ethiopia. [Manuscript in preparation]

unesco Chair

eDNA

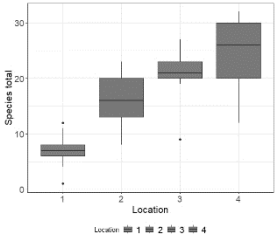

Environment
Sampling
DNA extraction
Amplification and Sequencing
Metabarcoding

KÄRNTEN
UNESCO Chair on Sustainable Management of Conservation Areas

Individual Identification

Species Identification

Number of Species



Monitoring Global Guideline

To be published in:
IUCN WCPA Technical Series

Publication (Series) Editors:
Daniel Dalton; Michael Jungmeier, Sunita Chaudhary; (Sue Stolton; Nigel Dudley)

Authors:
Daniel Dalton; Vanessa Adams; Vanessa Berger; Judith Botha; Sunita Chaudhary; Stephan Halloy; Robbie Hart; Michael Jungmeier; Hanns Kirchmeir; Vid Švara; Katia Torres Ribeiro

International standards and recommendations for monitoring
Provide uniform framework for decision-making and a common understanding and terminology (terrestrial and freshwater habitats)

unesco Chair

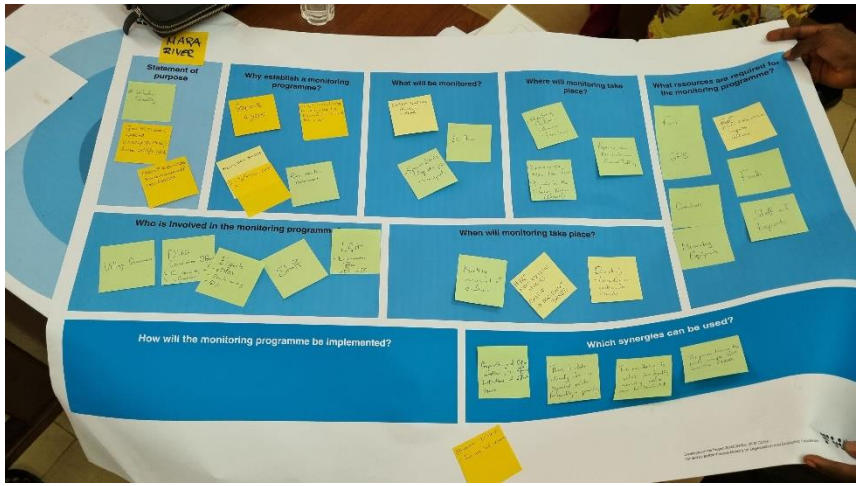
A framework for monitoring biodiversity in protected areas and other effective area-based conservation measures (OECMs)

Concepts, methods and technologies

Authors: Vanessa Adams, Vanessa Berger, Judith Botha, Sunita Chaudhary, Daniel Dalton, Stephan Halloy, Robbie Hart, Michael Jungmeier, Hanns Kirchmeir, Vid Švara, Katia Torres Ribeiro

KÄRNTEN
UNESCO Chair on Sustainable Management of Conservation Areas

Workshopdesign Monitoring Global Guideline



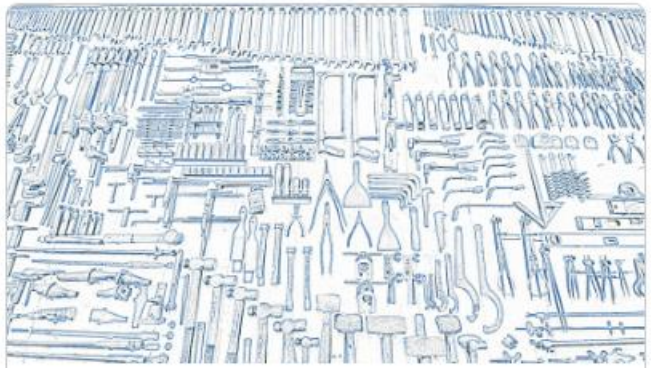
unesco Chair

Monitoring Configurator

Keyword-based search

This is a search based on keywords associated with each tool. In addition to keywords, tool titles and short descriptions are analyzed semantically. If semantic search fails, an additional search is performed based on letter sequences regardless of their meaning.

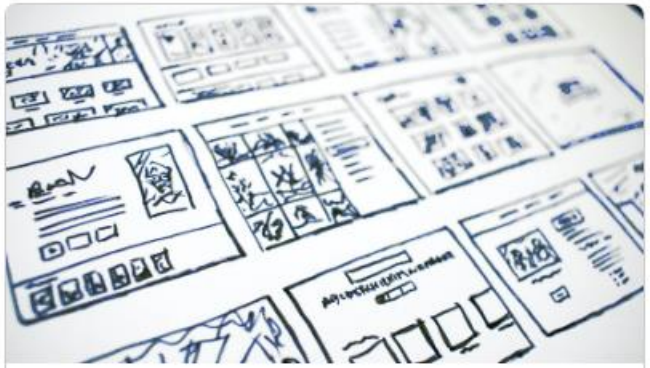
Search by keywords



Thematic search

Thematic search allows you to consequently and interactively limit the list of suitable environmental monitoring tools by means of various criteria, such as study object, study focus, groups of monitored organisms, application range, tool category, ease of use etc.

Start thematic search



Configurator

Configurator is aimed at helping professionals to plan environmental monitoring in given conditions. It points out which aspects must be considered to achieve optimal results. Also, Configurator helps to identify environmental monitoring tools suitable for the task at hand.

Start configurator

BioMONITEc *This project is funded by the FFG (**COIN** "Aufbau" (capacity building) funding line) - www.ffg.at*

Federal Ministry
Republic of Austria
Labour and Economy

FFG
Promoting innovation.

Thank you

Let´s stay in contact

E-Mail: V.Berger@cuas.at

Vanessa Berger

unesco_mca_team

BioMONITec

Biodiversity Monitoring Technologies Test, Development and Transfer of disruptive engineering technologies into conservation practice

Vanessa Berger

Federal Ministry
Republic of Austria
Labour and Economy

FFG
Promoting Innovation.

KÄRNTEN
UNESCO Chair on
Sustainable Management
of Conservation Areas

*This project is funded by the FFG (**COIN** "Aufbau" (capacity building) funding line) - www.ffg.at*