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Introduction to the WildDrones project

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**Engineering and
Physical Sciences
Research Council**



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Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
**State Secretariat for Education,
Research and Innovation SERI**

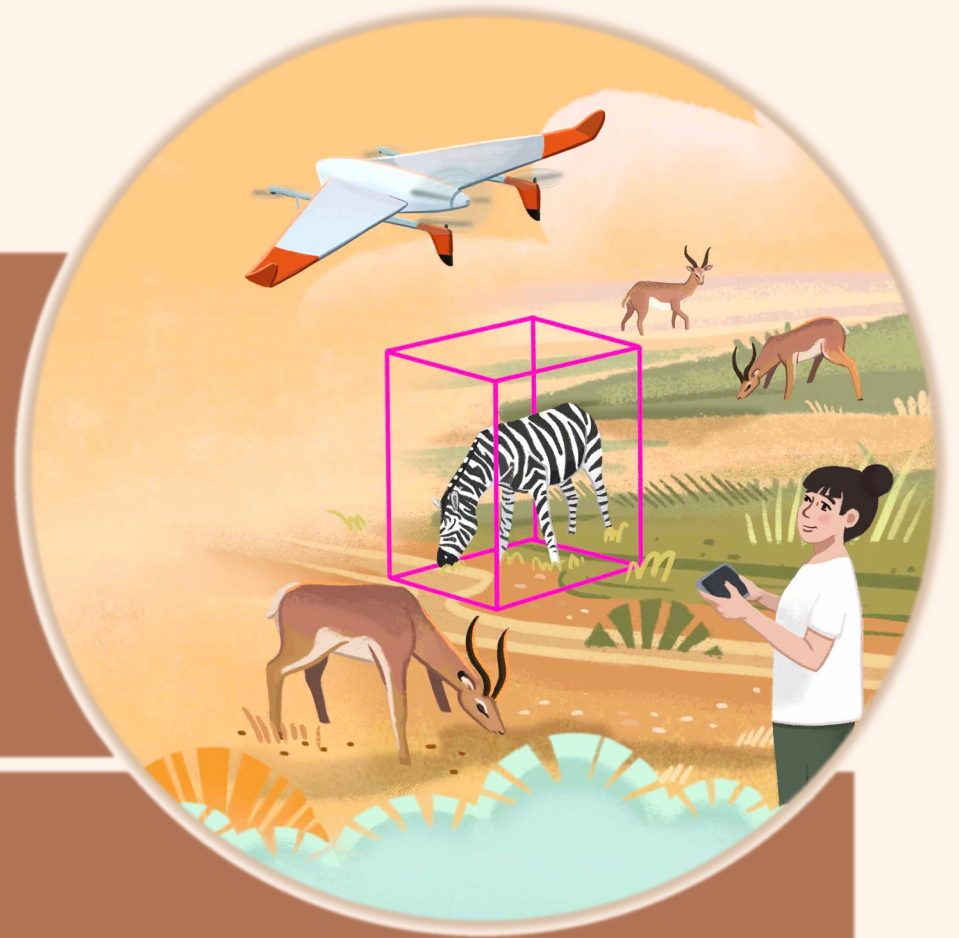
WildDrone is an MSCA Doctoral Network funded by the European Union's Horizon Europe research and innovation funding programme under the Marie Skłodowska-Curie grant agreement no. 101071224. Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

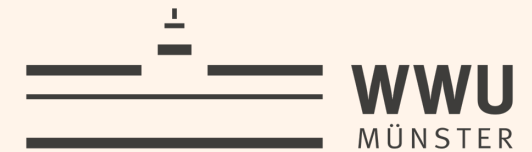
WildDrone project: A quick overview

Period: 2023-2026

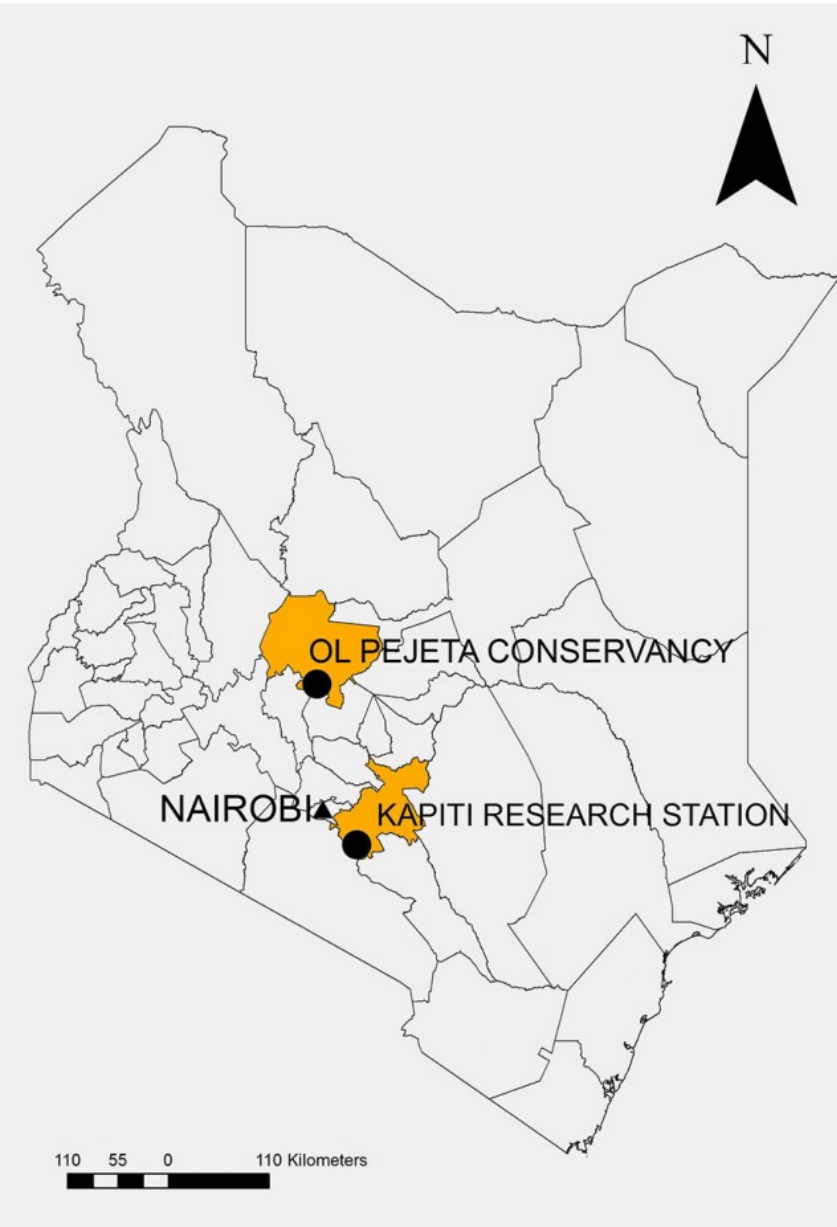
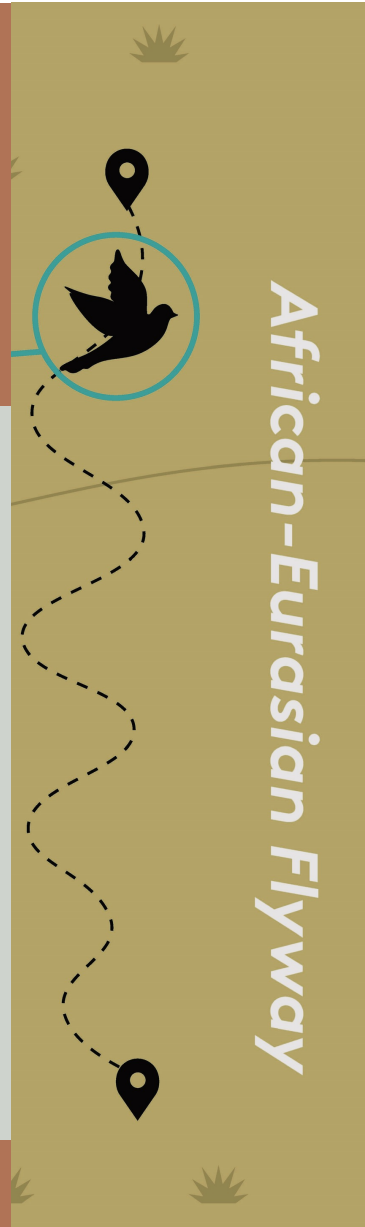
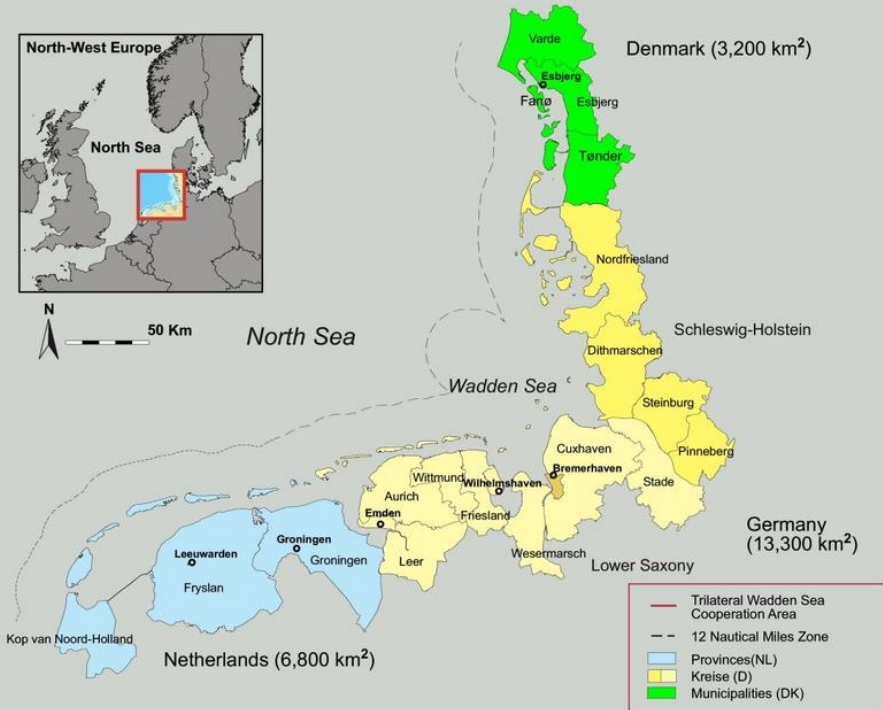
Budget: 3.7M EUR

MSCA network with 13 PhD-students



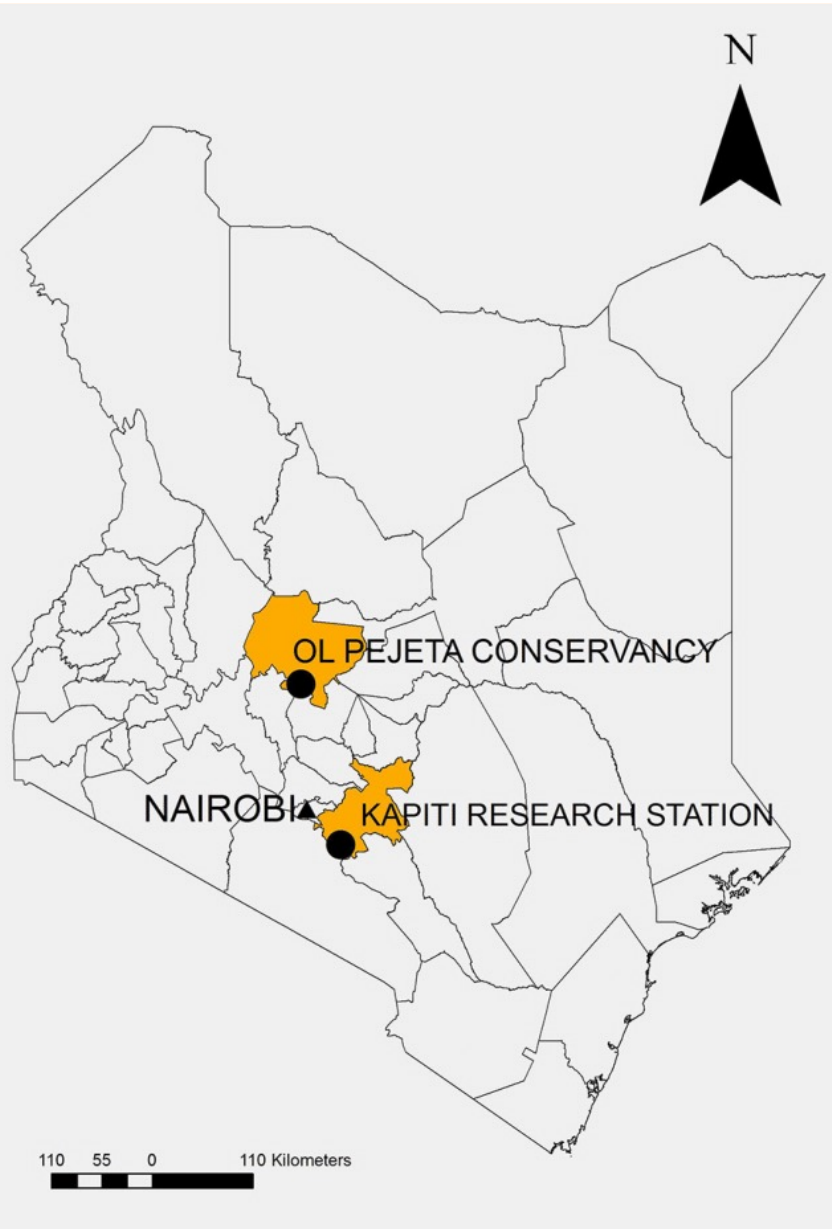


Nature conservation across Europe and Africa



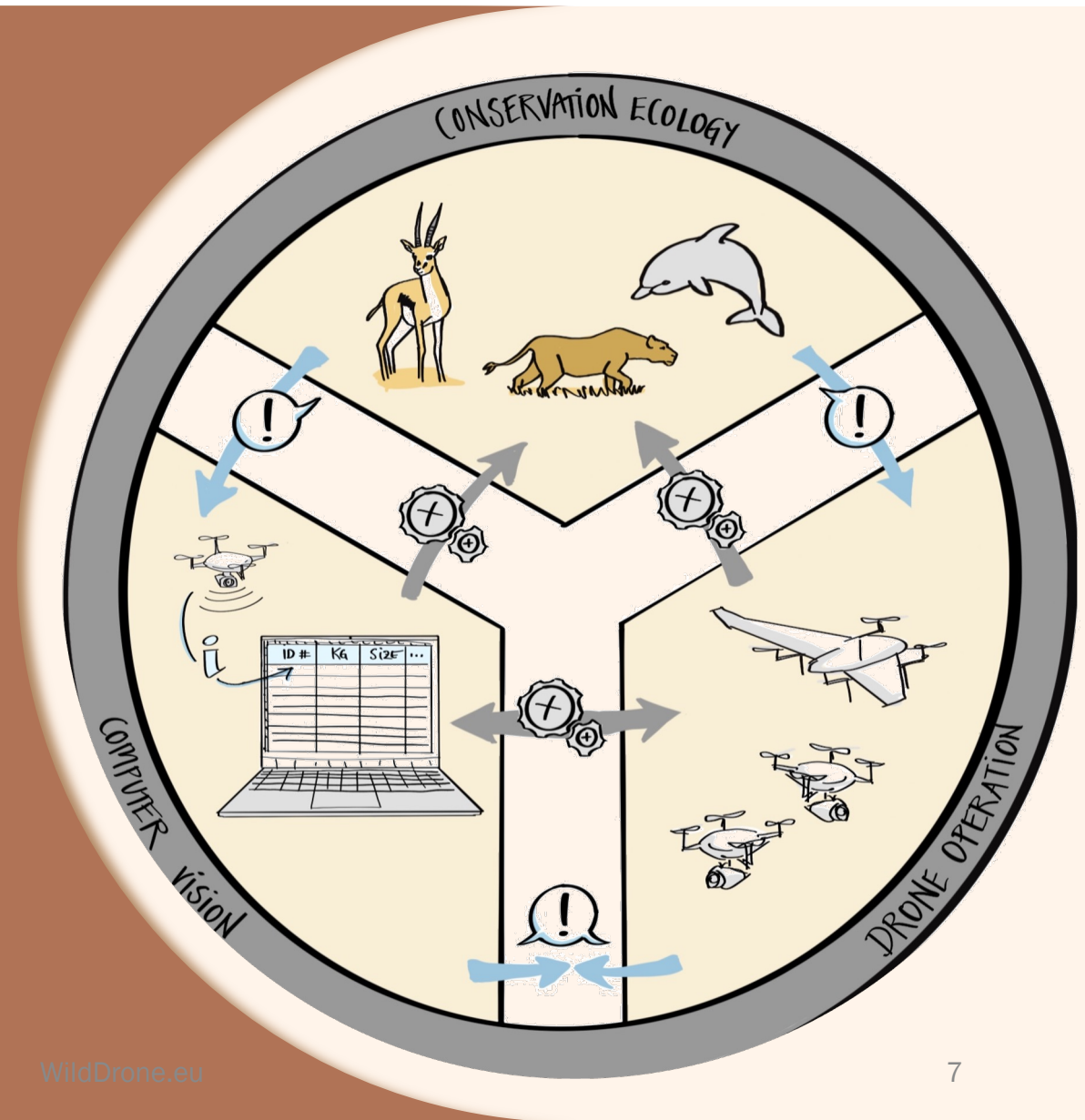


African-Eurasian Flyway



Methodology

Interdisciplinary basic research doing “science that matters” using open science principles and with application in Europe and the global south.



13 projects across 3 themes

PREDATOR-PREY RESPONSE
behavioral response

MIGRATION ANALYSIS
Soaring environment

COASTAL MONITORING
Movement patterns
Foraging patterns
Avoid conflict

LIVESTOCK-WILDLIFE INTERACTION
prevent conflict

REAL-TIME CENSUS
Abundance?
Body condition?

Illustration: BrainzBusiness

ADAPTIVE TRACKING

INTERACTIVE CENSUS

INDIVIDUAL CHARACTERISTICS

HABITAT RECONSTRUCTION

Illustration: BrainzBusiness

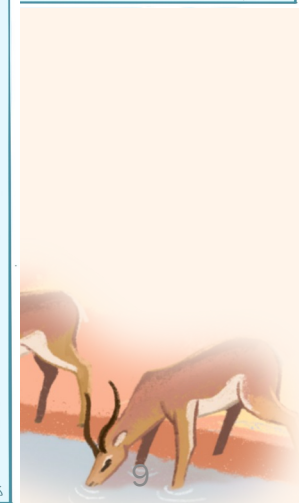
PARASITIC DRONES

CALM DRONES

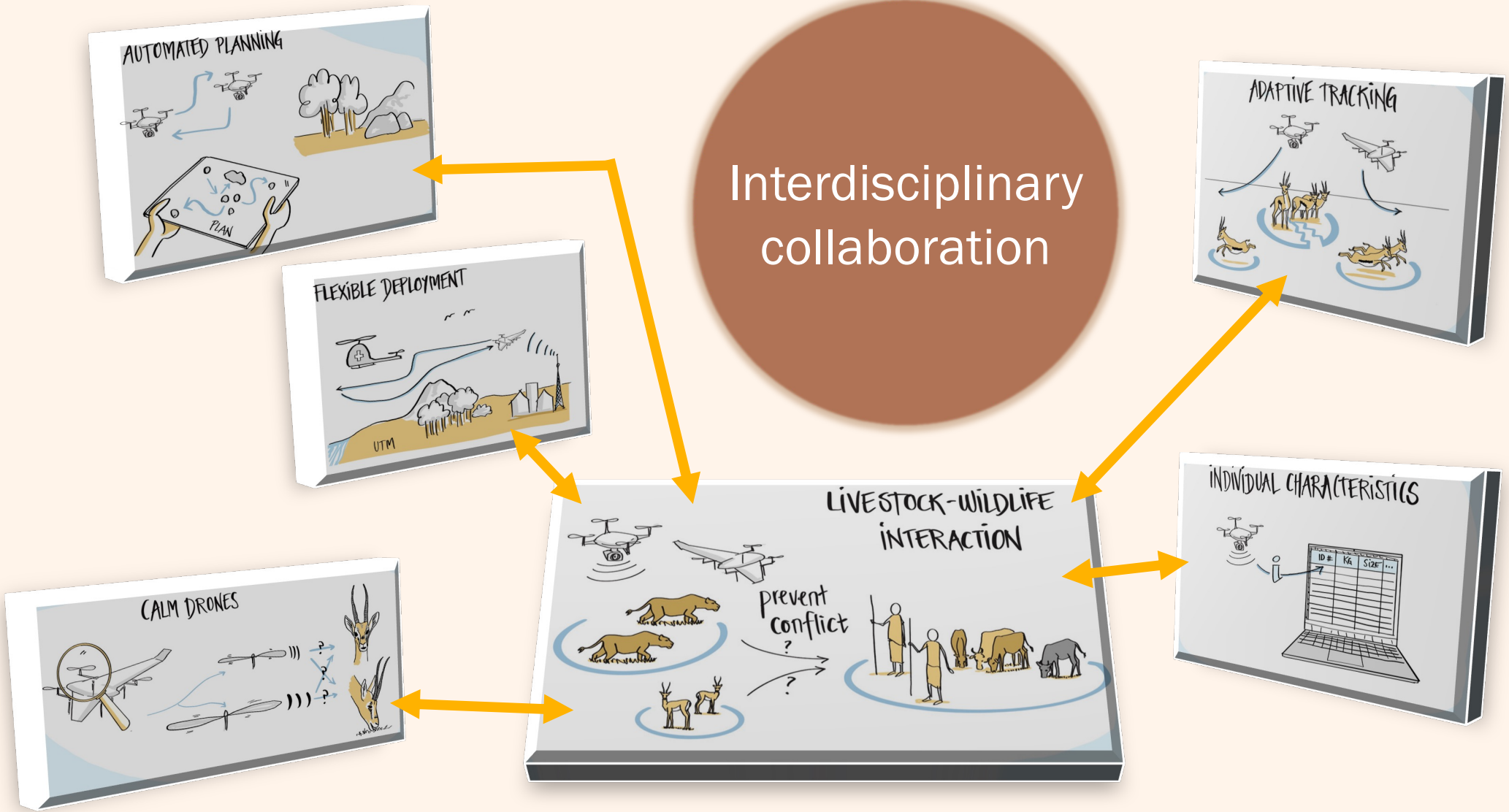
AUTOMATED PLANNING

FLEXIBLE DEPLOYMENT
UTM

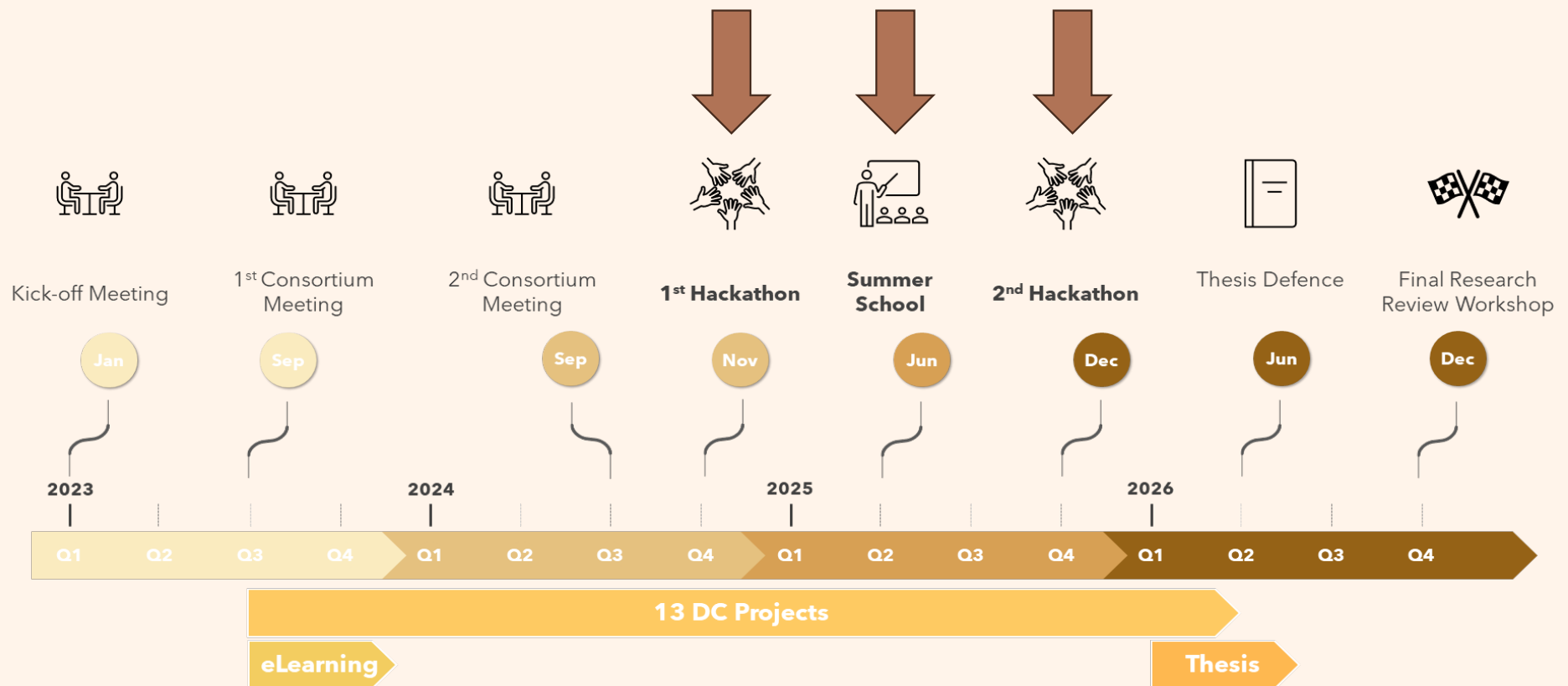
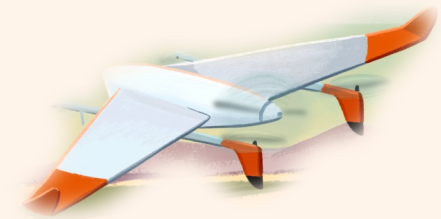
Illustration: BrainzBusiness



Interdisciplinary collaboration



Timeline





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Drones 3D: 'Supporting the Dull, Dirty & Dangerous'





Schellenberg B, Richardson T, Watson M, et al. Remote sensing & identification of volcanic plumes using fixed-wing UAVs over Volcán de Fuego, Guatemala. *J. Field Robotics*. 2019;1-20. <https://doi.org/10.1002/rob.21896>

Robotics Challenges in Conservation Ecology

- Bénoué National Park
- 180,000 Hectares
- Find the Kordofan Giraffe?

Kordofan Giraffe, Bénoué National Park,
University of Bristol, December 2019

Theme 2

Safe and Flexible Drone Operations

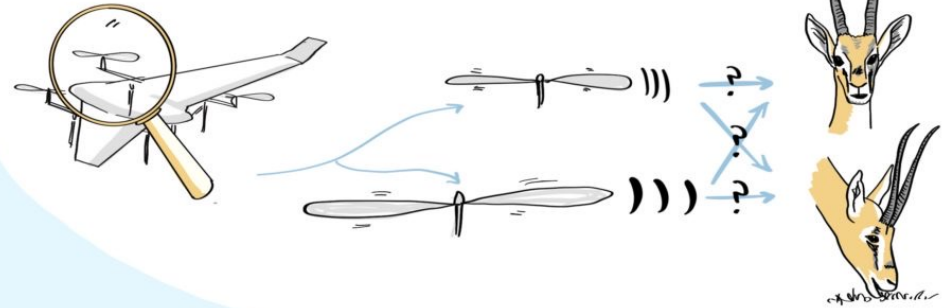
- Linking machine learning & flight control
- Deployable drones & collaborative control
- Vehicle design & in-flight optimization
- Quiet Drones adapted to the needs of ecology and nature conservation
- Fieldwork in Europe and Africa
- Legal Requirements & Paperwork



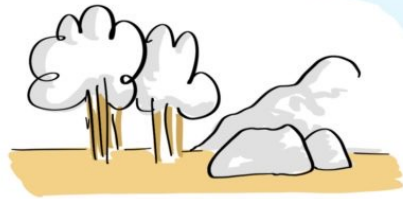
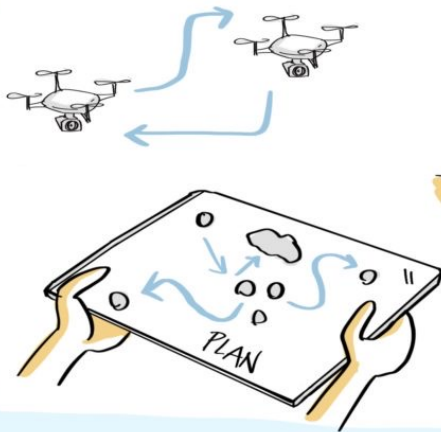
MUTUALISTIC DRONES



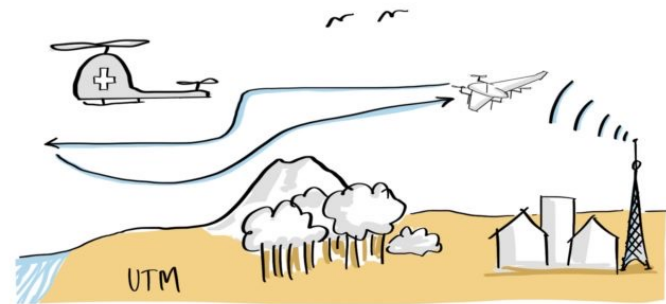
CALM DRONES



AUTOMATED PLANNING



FLEXIBLE DEPLOYMENT

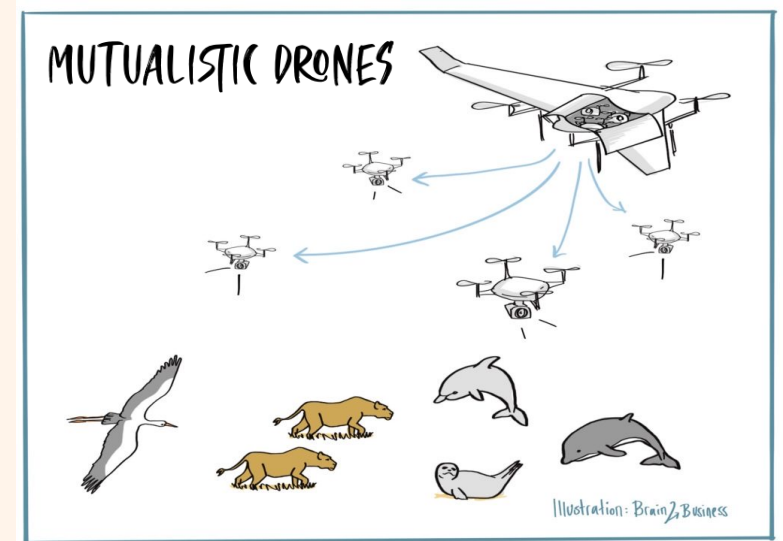


Example Project 13: Mutualistic Drones

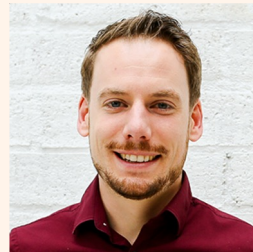
Planned Secondments:

- University of Southern Denmark; disturbance rejection.
- AVY (Netherlands); experiments and integration with the AVY platform.

Supervision + secondments:



Tom Richardson



Matthijs Damen



Robert Ladig

PhD candidate



Kilian Meier

Coming soon! – WildBridge

- Wildlife toolkit for your drone
- Initially supporting DJI Mavic 3 Enterprise
- Enable the use of a robust and off-the-shelf platform for testing real-time vision algorithms
- Conservation focussed tools: e.g. animal count and distance estimation
- Summer 2024 Release V1.0



WildDrone.eu

Questions?

- WildDrone.eu
- thomas.richardson@bristol.ac.uk



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