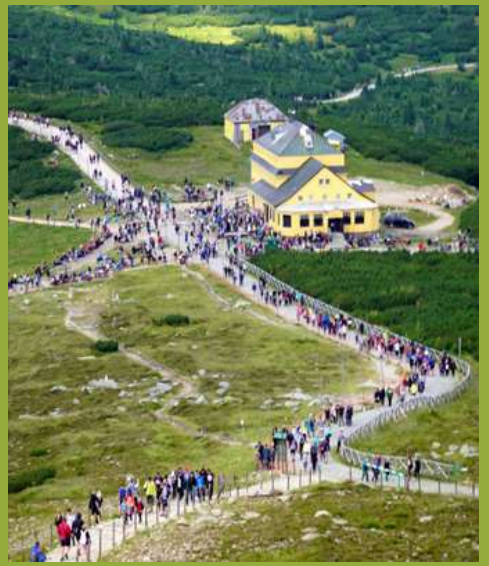
New approaches to assess tourist antropopression
Karkonosze National Park case study



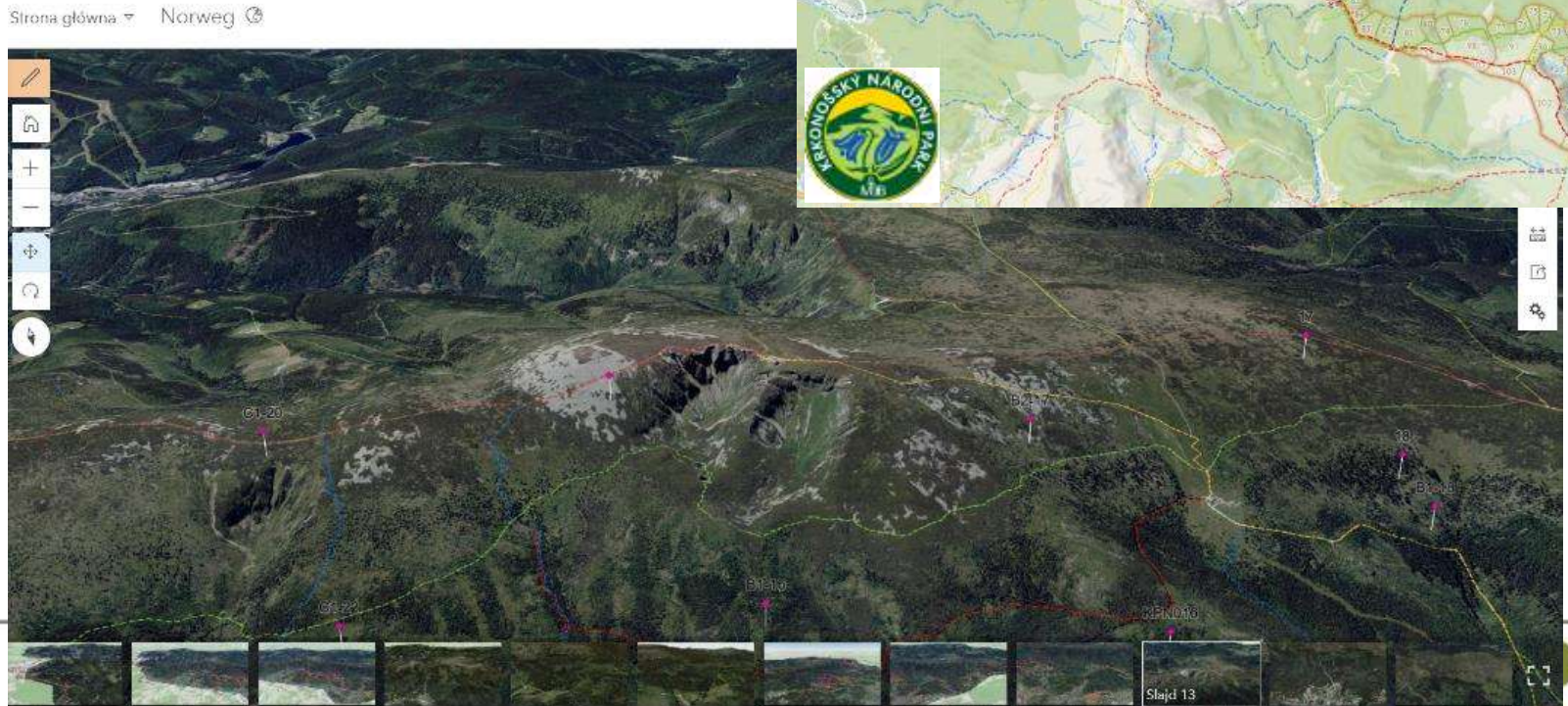
Monika Rusztecka-Rodziewicz
Karkonosze National Park

dr hab. Agata Cieszewska, dr Joanna Adamczyk
Warsaw University of Life Science

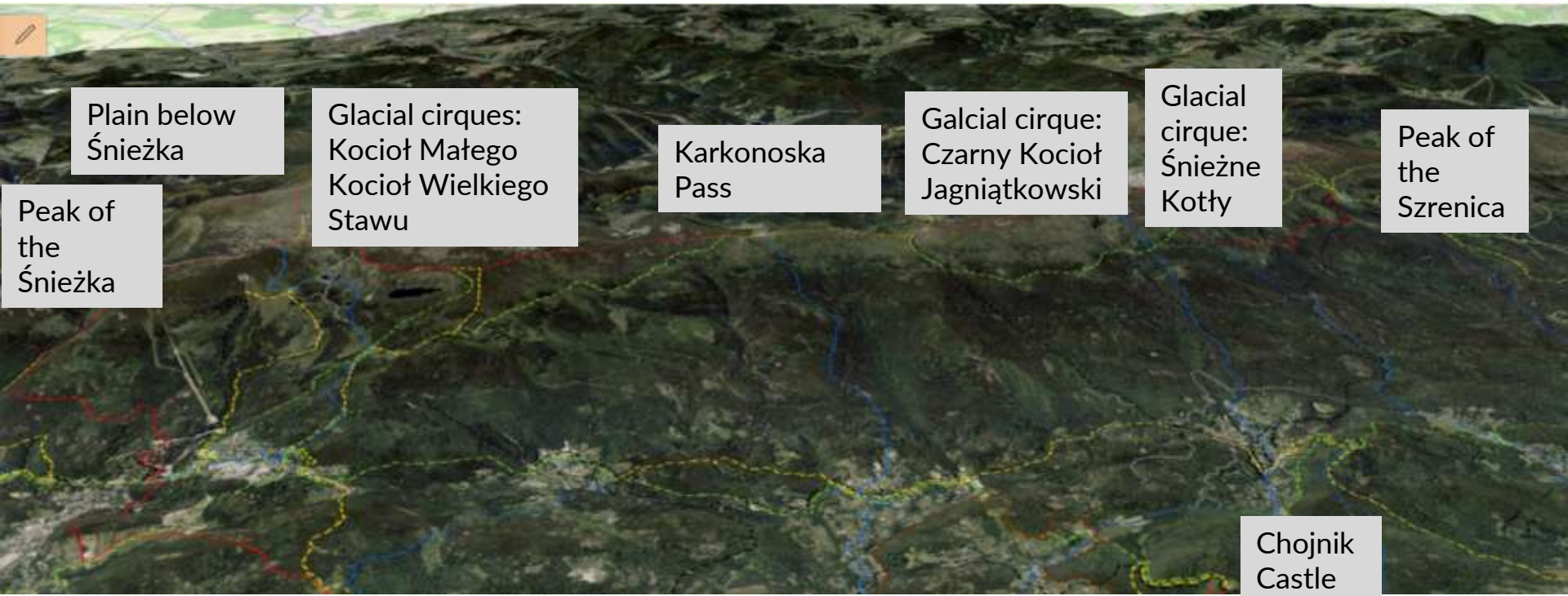
Trans Park Net Meeting 9-12 June, 2025 Jelenia Góa

Karkonosze National Park

- Area of 6000 ha;
- 131 km of tourists trails;



- 2,4 mln visitors/year



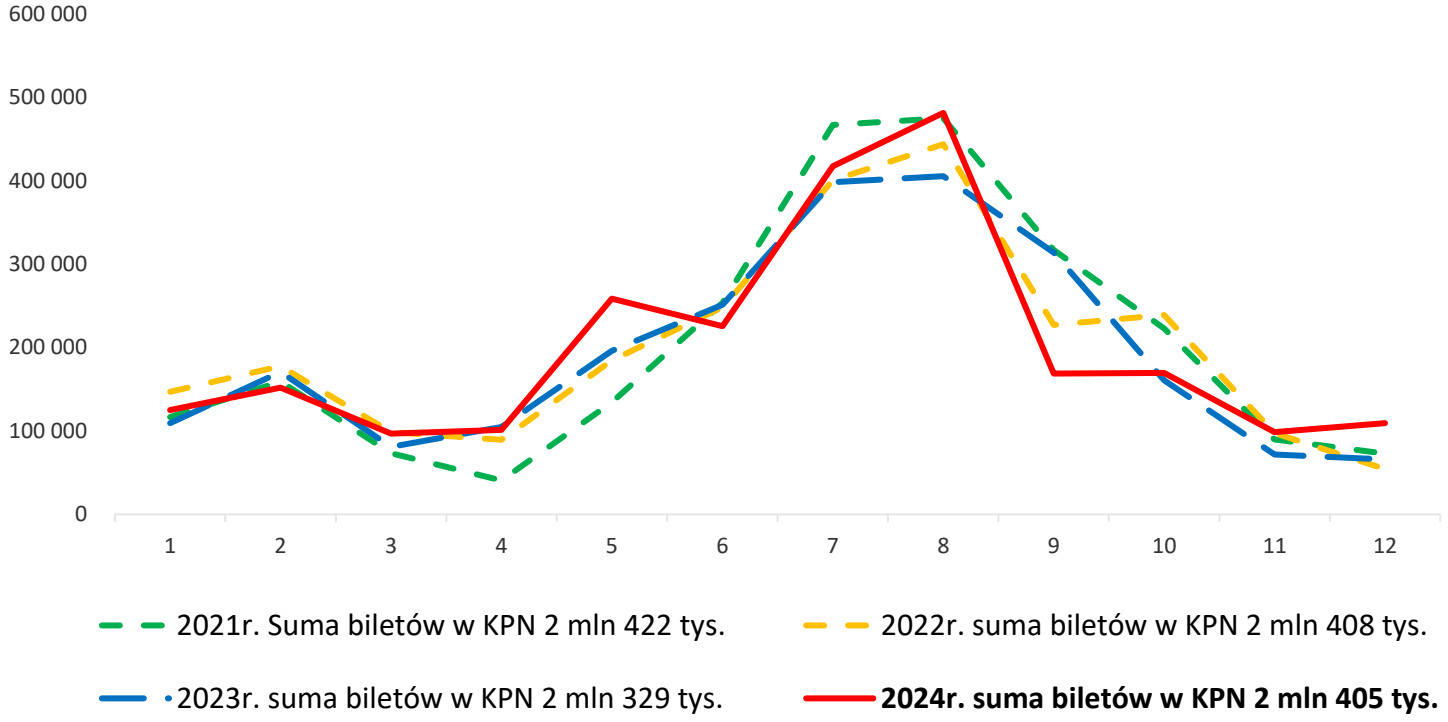
Tourist traffic in KPN

- From June to October high season (over 250 000 /month, 450 000 in July/August)

Days with the highest number of tourist:

- 17th June (17 200) – 2022
- 14th August (15 100) - 2022
- **12th November** (14 700) – 2022
- 2nd May (23051) - 2024

Number of visitors in Karkonosze NP 2021 - 2024



Legal framework for tourism management

- Nature Protection Act art. 12, art. 15
  - *NP can be made accessible for tourism in a way that not negatively affect nature;*
  - *Director determine a way of making NP available (type of toursim and sport activities and location of available tourist trails);*
  - *Max. number of people at the same time in a given location must be defined by Director in a directive;*
- Protection Plan for Karkonosze NP (Directive of MoCE Dz.U. 2021 poz. 882)

Key problems and threats

- Pressure on strictly protected areas due to tourist and sport activities („challenge” tourism, skitouring off-piste);
- Disturbance of the animals and condition of high mountain habitats due to off-trails activities;
- Light and noise pollution;
- Illegal movement around inaccessible areas;
- Overnight tourism.

It is not only how many? It is also about „where" and „what"?

- **Focus on the vulnerability of the environment** related to tourist activities;
- Recognition of the spatial distribution patterns of visitors flow;
- Recognition of the spatial distribution patterns of animals;

Monitoring data collection

Hybrid approach with use of data from ecocounters
(18 locations), statistics of the entry fees, phototraps, social media

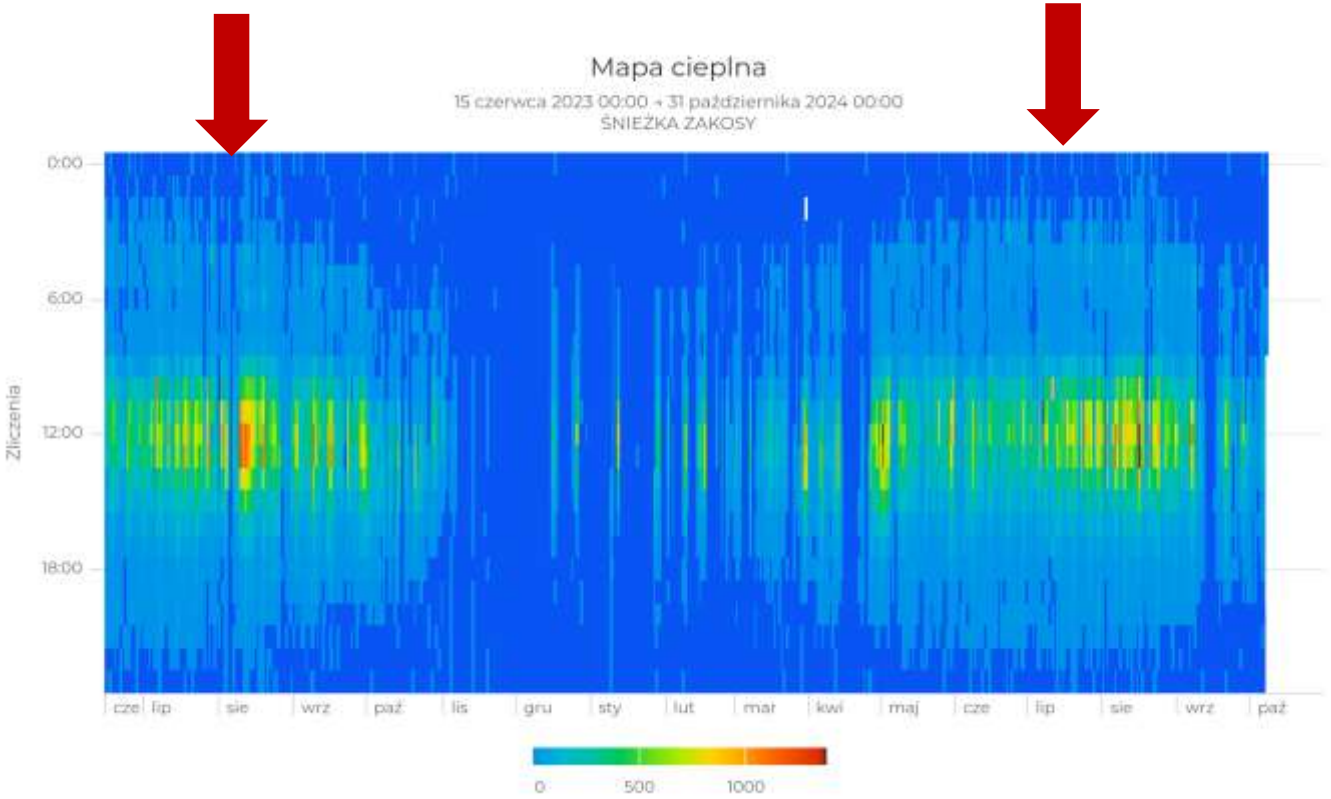
STRAVA

TRAPPER

Ecocounters data collection

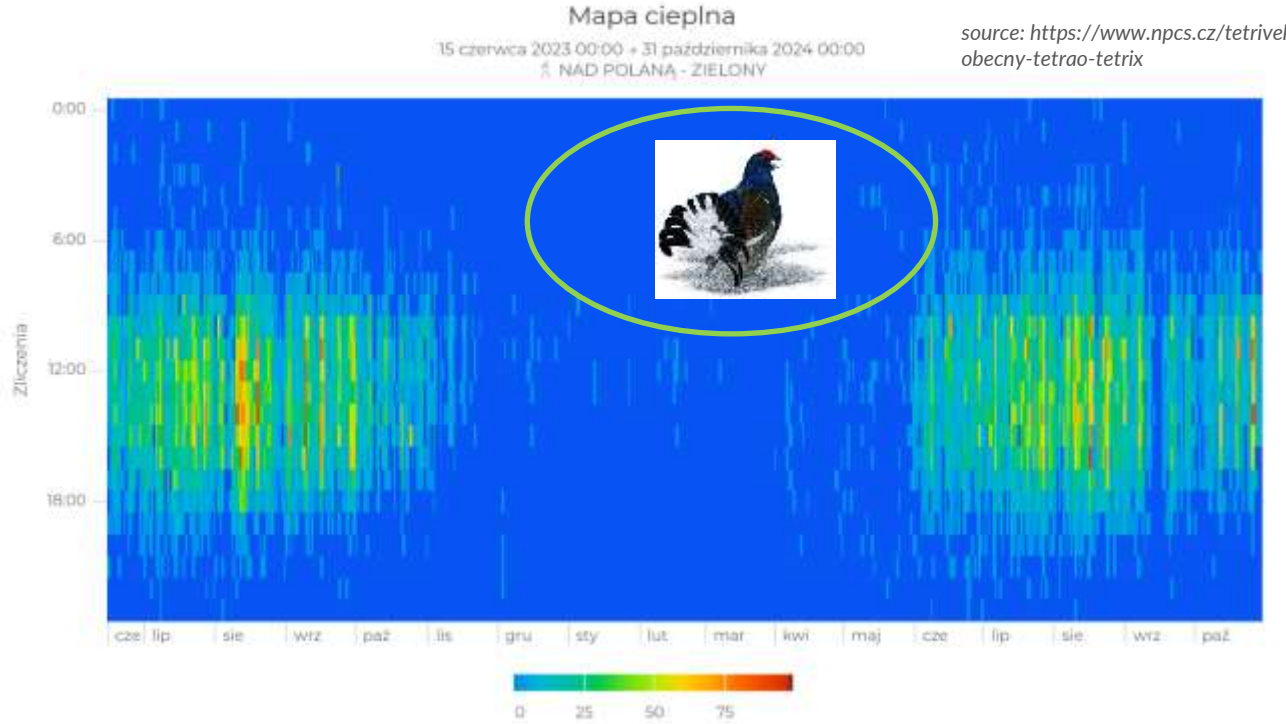
Heat map of the daily distribution and occurance of visitors - Śnieżka

High season problems:
– permanent presence of visitors
- overnight tourism (sunrise and sunset walks)
- lack of silence during a night



Ecocounters data collection

Heat map of the daily distribution and occurance of visitors on *Black Grouse* habitats



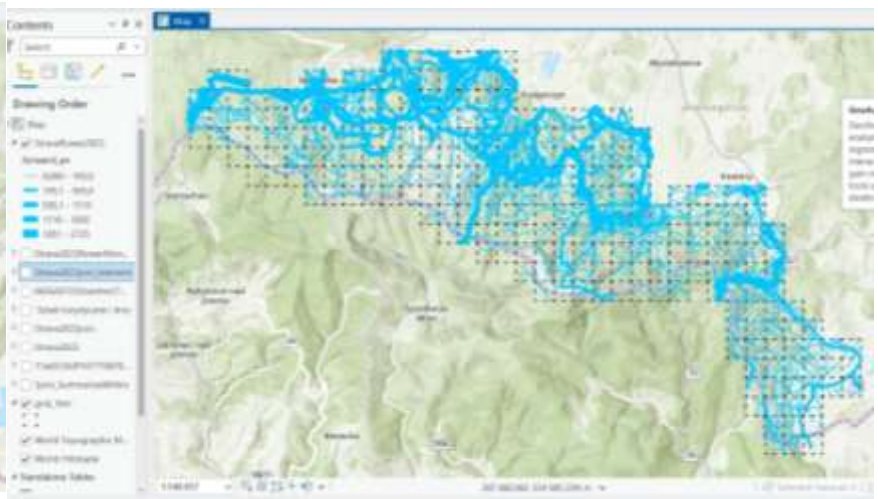
source: https://www.npcs.cz/tetrivek-obecny-tetrao-tetrix

What is a spatial distribution of the tourists?

STRAVA

TRAPPER-AI

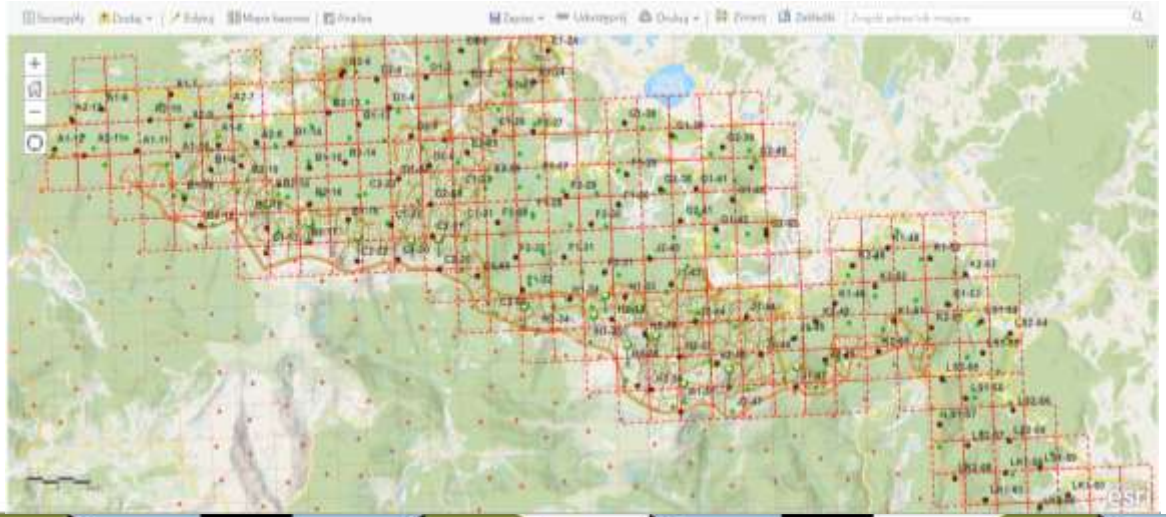
STRAVA data (quantitive)



Tourist presence - spatial distribution and intensity for runners and walkers, and bikers

How to recognise the distribution of tourist and animals

- Based on the AI modeling with phototrap datasets
- 135 locations of the tourist trails and 60 location on the tourist trails



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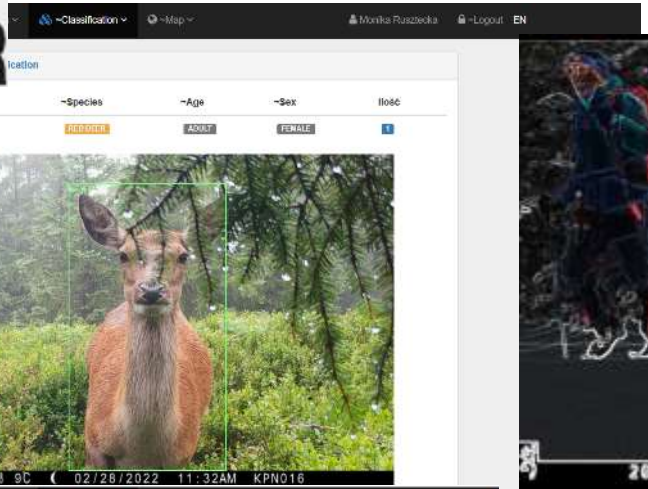
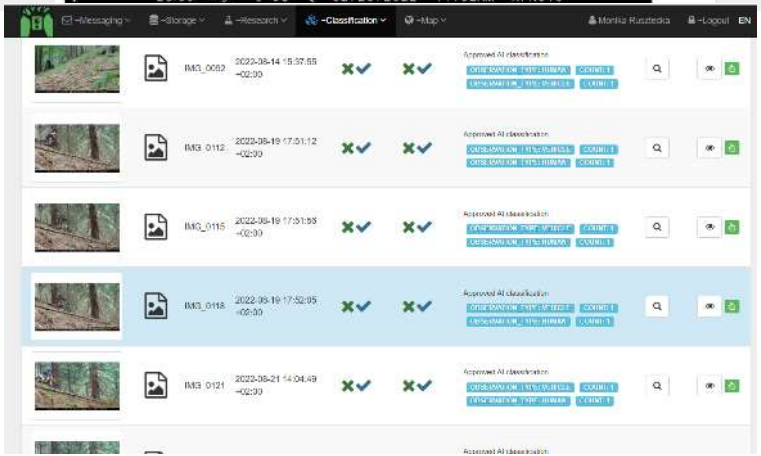
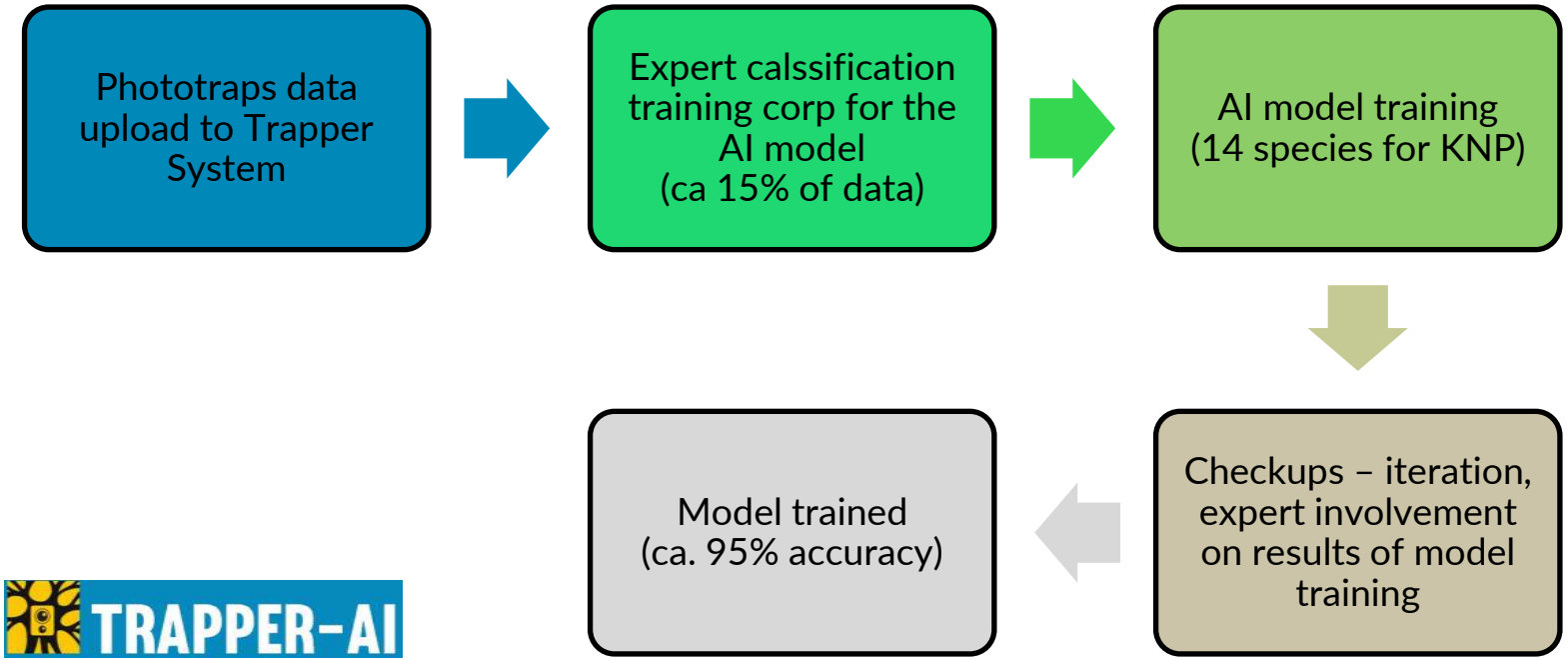
TRAPPER





Polskie Parki Narodowe

AI Application
First → collect data and train a model



TRAPPER-AI

Wildlife data classification

(441 K photos)

Step 1

- Implementation of the **Megadetektor Model by** Microsoft: 4 classes
  - Animal
  - Human
  - Vehicle
  - Blank – only geographical and landscape background;

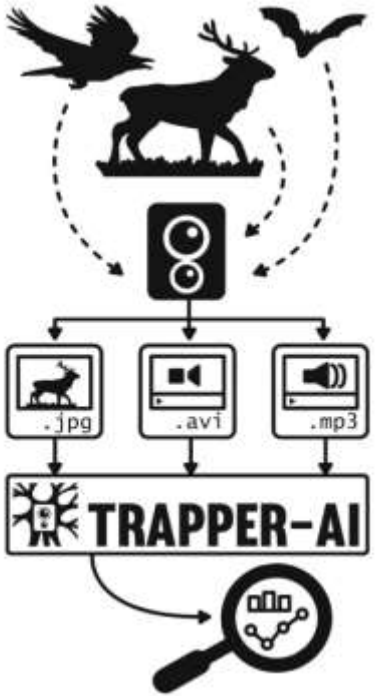
  https://github.com/microsoft/CameraTraps/blob/main/megadetector.md

- **The DeepFaune initiative: https://www.deepfaune.cnrs.fr/en/**

Iceland Liechtenstein Norway grants

Wildlife data classification with Trapper AI

Iceland Liechtenstein Norway grants



Trapper AI model claysifing 14 species in KNP

Ryc. Piotr Tynecki SLAVIC AI, OSCF

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76%

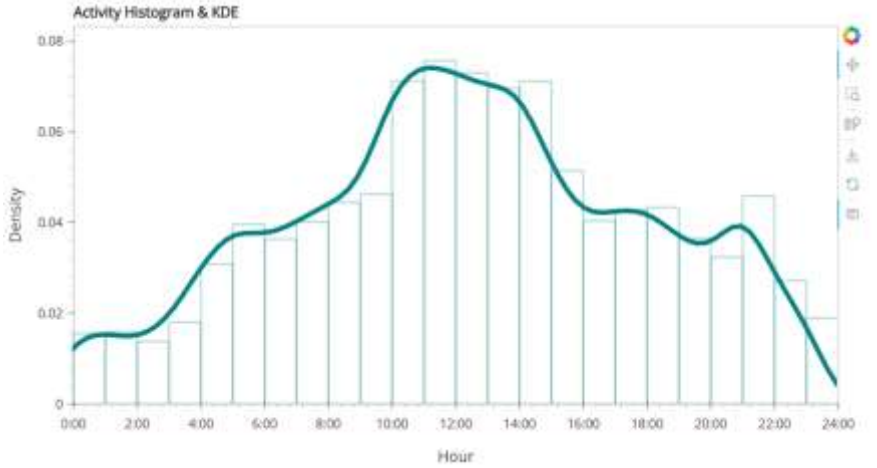
Skitouring off-piste track is a, great path for predator and direct threat for *black grouse*

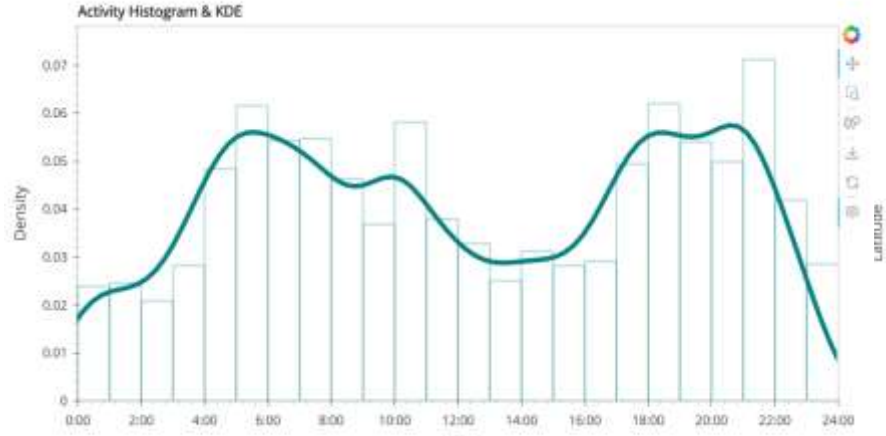
Polskie Parki Narodowe

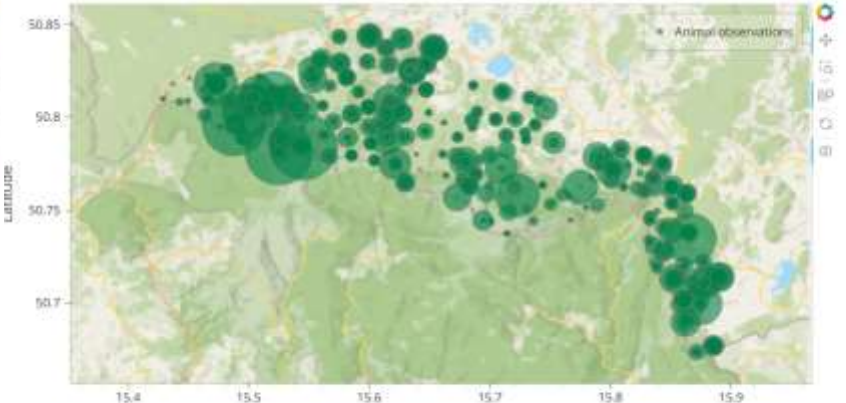
Results – information scope of database

- Location of observation;
- Date of observation;
- Class from step 1 (animal, human, vehicle, blank);
- Species identification or type of human activity (incl. motorcross, hunting, walk with dog etc.);
- Metadata (temperature, date, time);
- Indexes: TrapRate, Count, Daily activity

TrapRate Index for Tourists and Animal presence

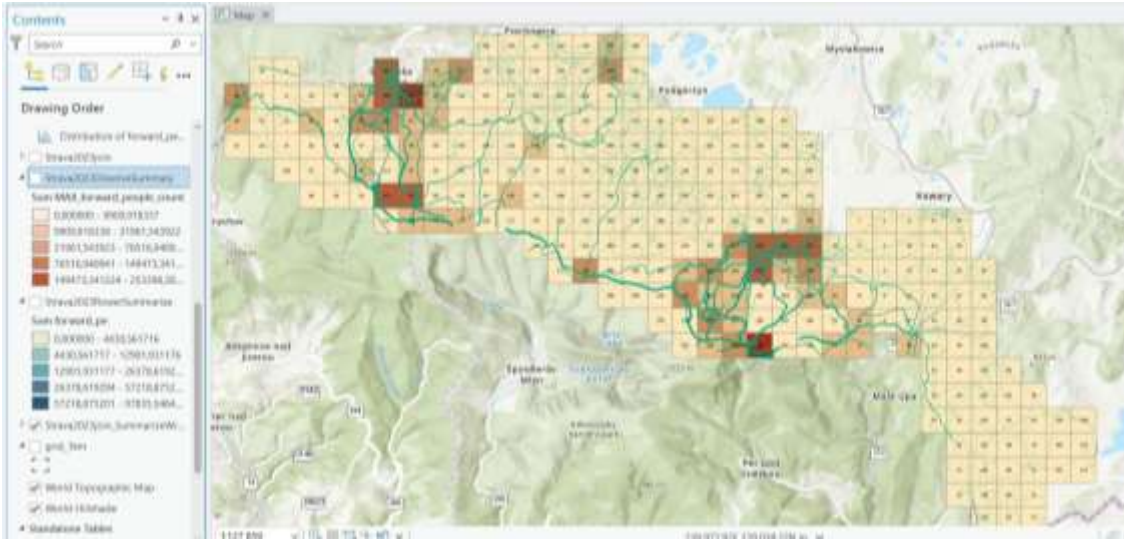






Designation of the conflict area

- Combinig data from STRAVA and Trapper allows for recognition of conflicting area;
- Operational database allows for identification of the overloaded area;
- Basis for argumentation for the management of the national park - limiting traffic, closing/changing trails,



Applications

- Spatial database with set of indicators on voulnerabilty factors resulted from spatial analysyes of GIS data and statistical data;
- Improvments on defining arguments for tourist management rules e.g. for potential limitations on trails, or rules on tourist and sport activities;
- Revision of directive in KPN on maximum number of tourist at once/move through a given area with justification of spatial distribution;
- Better adjustment of trails accesibility to KPN Protection Plan requirements;

Thank you for your attention

Polskie
Parki
Narodowe