LIFE PASTORALP
Pastures vulnerability and adaptation strategies to climate change impacts in the Alps

Fort de Bard - Aosta valley
16/03/2023

SCO SPACE FOR CLIMATE OBSERVATORY

OFB OFFICE FRANÇAIS DE LA BIODIVERSITÉ

ORION - biOdiveRsity Impacts of shrub expaNsion

Incorporating (shrub) ecotone monitoring into alpine land management and biodiversity conservation: a pilot study from the Chamonix valley

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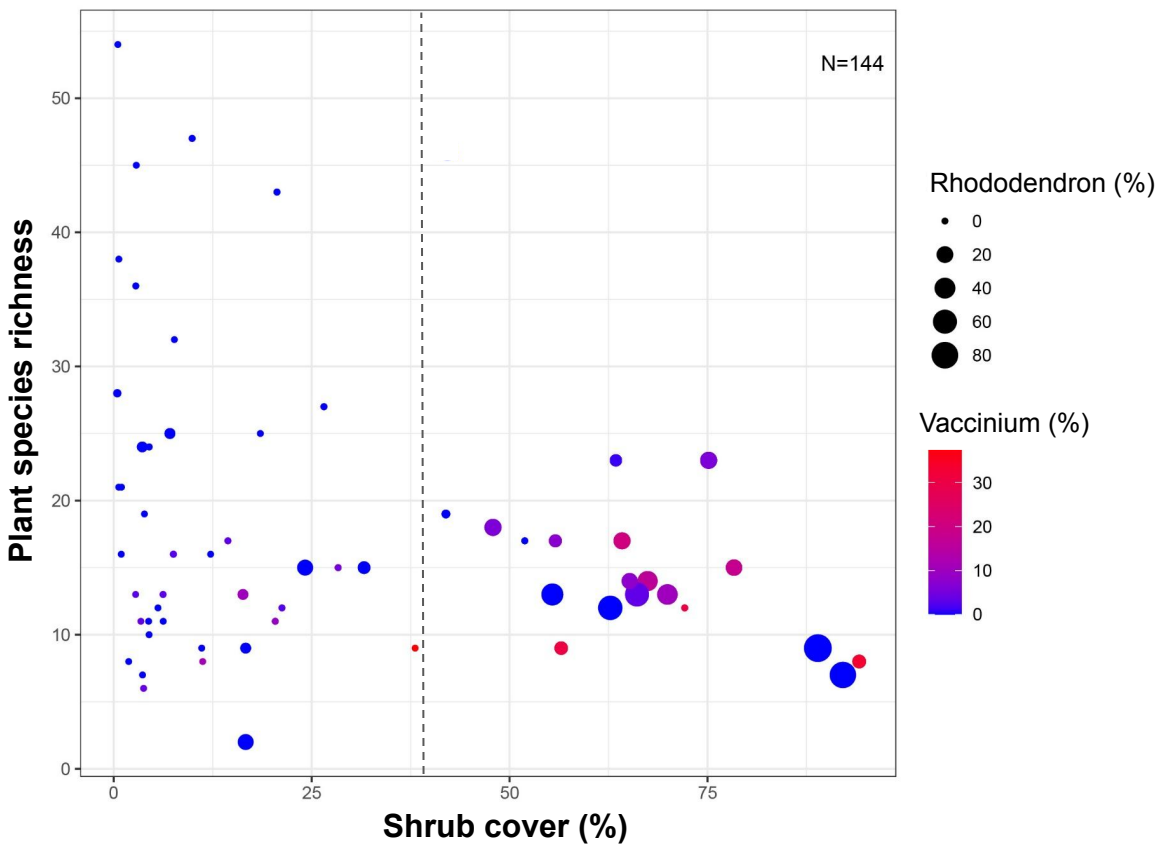
VALLÉE DE CHAMONIX MONT-BLANC

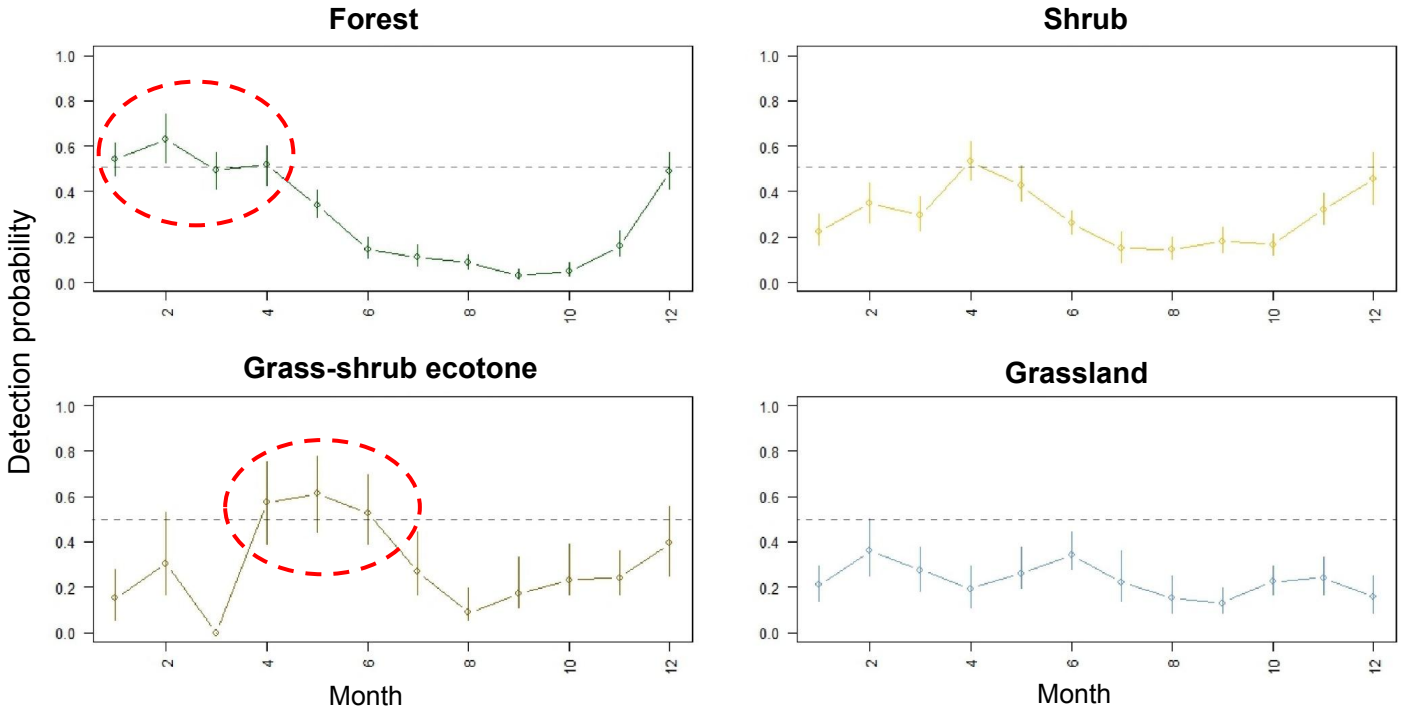
Changes in shrub line: the “lost ecotone” of the Alps

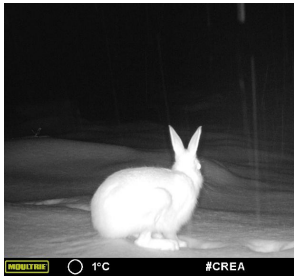
Implications for biodiversity and domestic grazing

- **Observed decrease in plant diversity when shrub cover exceeds 40%**
- Mostly associated with *R. ferrugineum* and *V. uliginosum*



Implications for biodiversity and domestic grazing



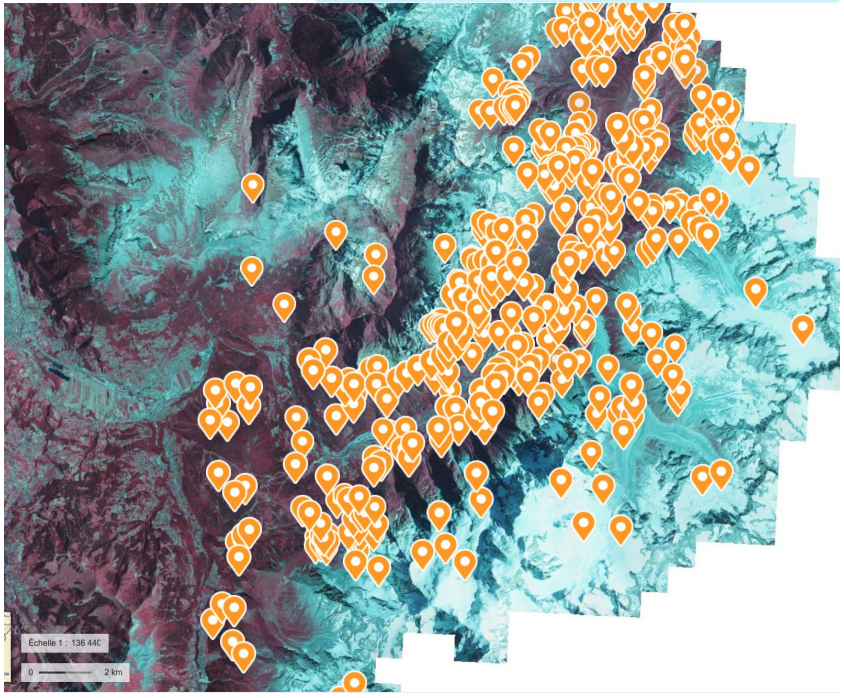


- Mountain hare spends more time in the forest during winter months and at the grass-ecotone in summer

Implications for biodiversity and domestic grazing

ORION project - habitat mapping w/ Sentinel-2

1) 900 photo-interpreted training points



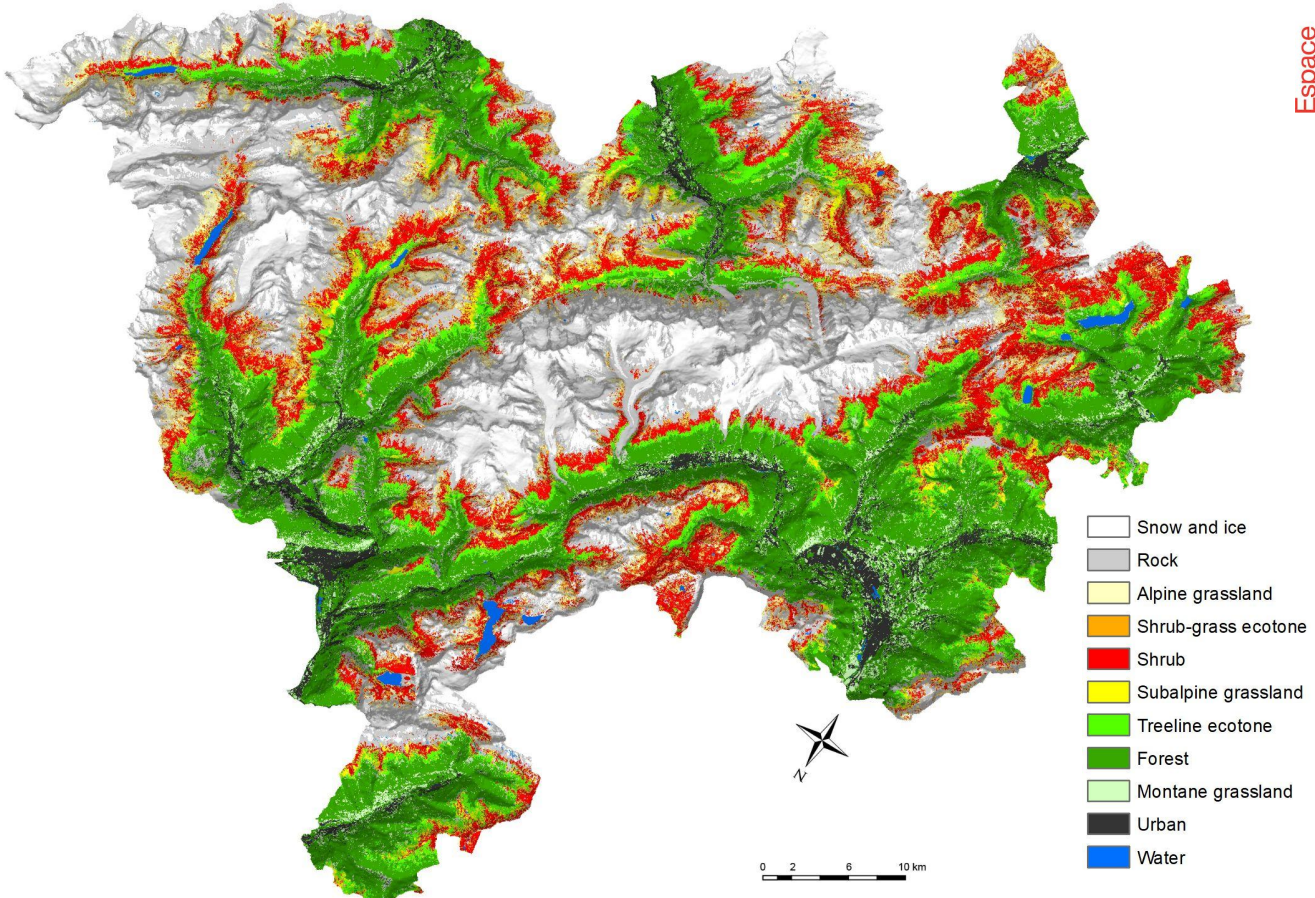
2) *Random forest* calibration (10m spatial res.)

Habitat class	~	**Explanatory variables** (2017-2021 mean)
Snow and ice		
Rock		Snow-free growing degree days (SFGDD)
Alpine grassland		Fall brightness index (BI)
Shrub-grass ecotone		Anthocyanin index (NARI)
Shrub		Date of growing season start (SOSD)
Subalpine grassland		Prod. end of season (EOSV)
Treeline ecotone		Soil moisture index (NMDI)
Forest		Topo (TPI, DAH)
Montane grassland		
Urban areas		
Water		

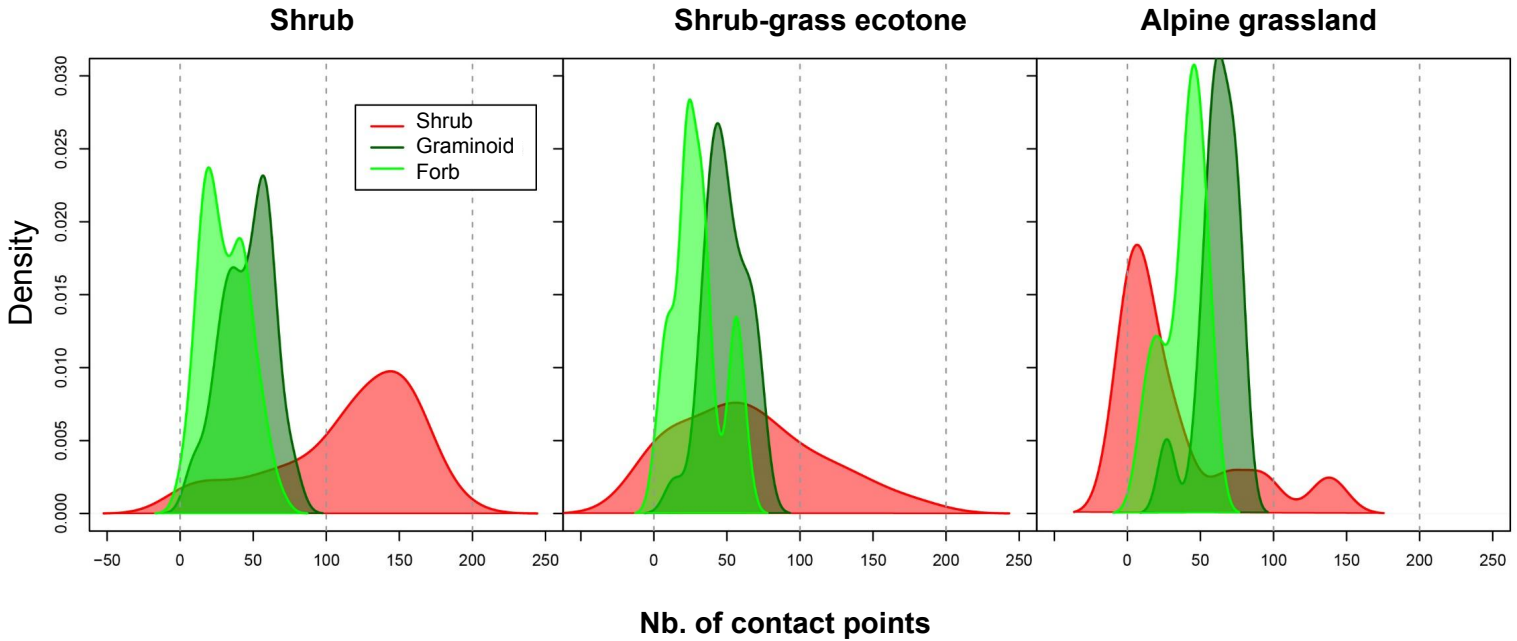
3) Error rate = 12%

4) Predict (upscale)

Habitat mapping at the scale of Espace Mont-Blanc

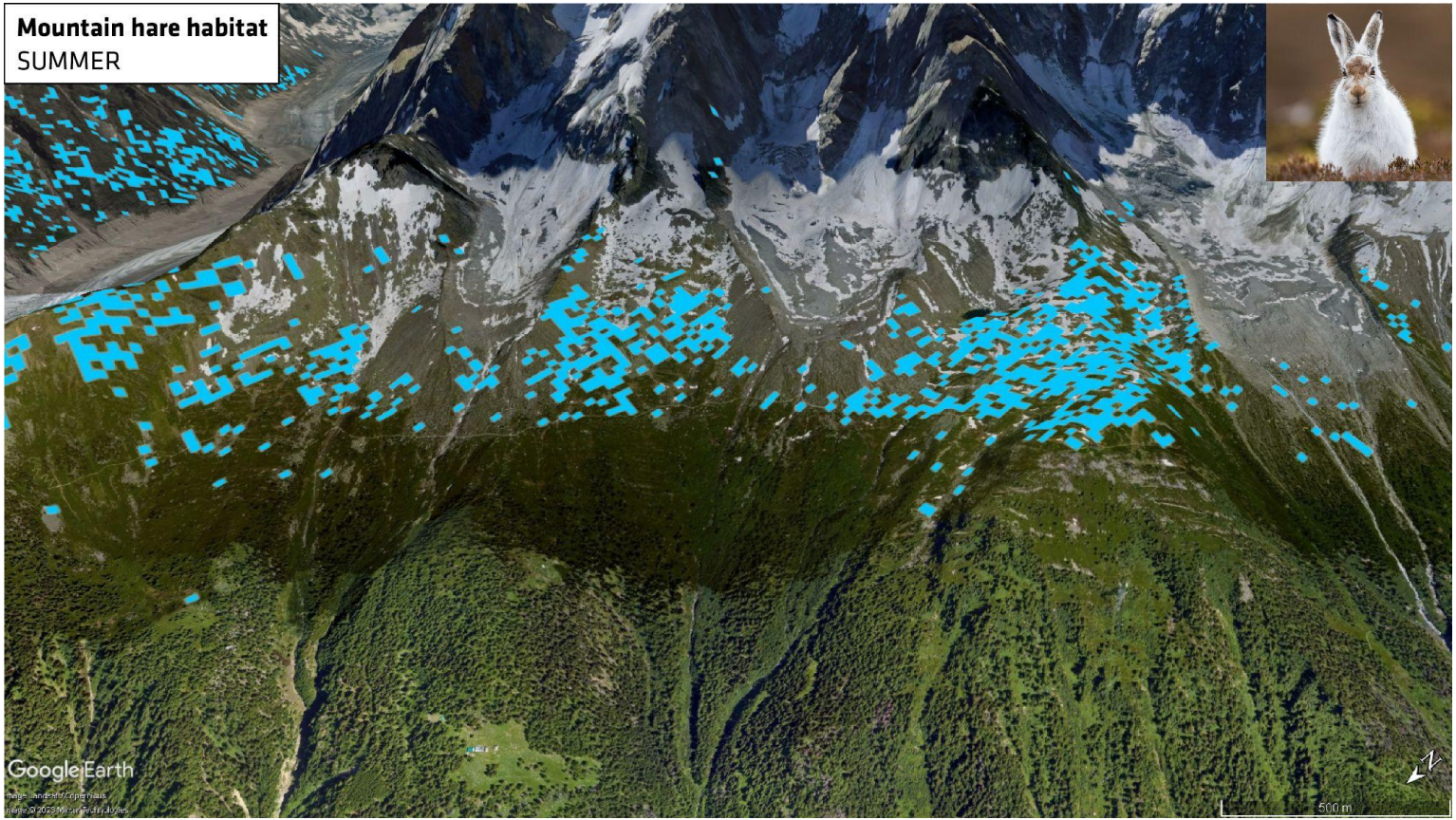


Field validation - 144 sample points



→ Strong agreement between habitat classes and plant functional groups

Links to conservation and land management



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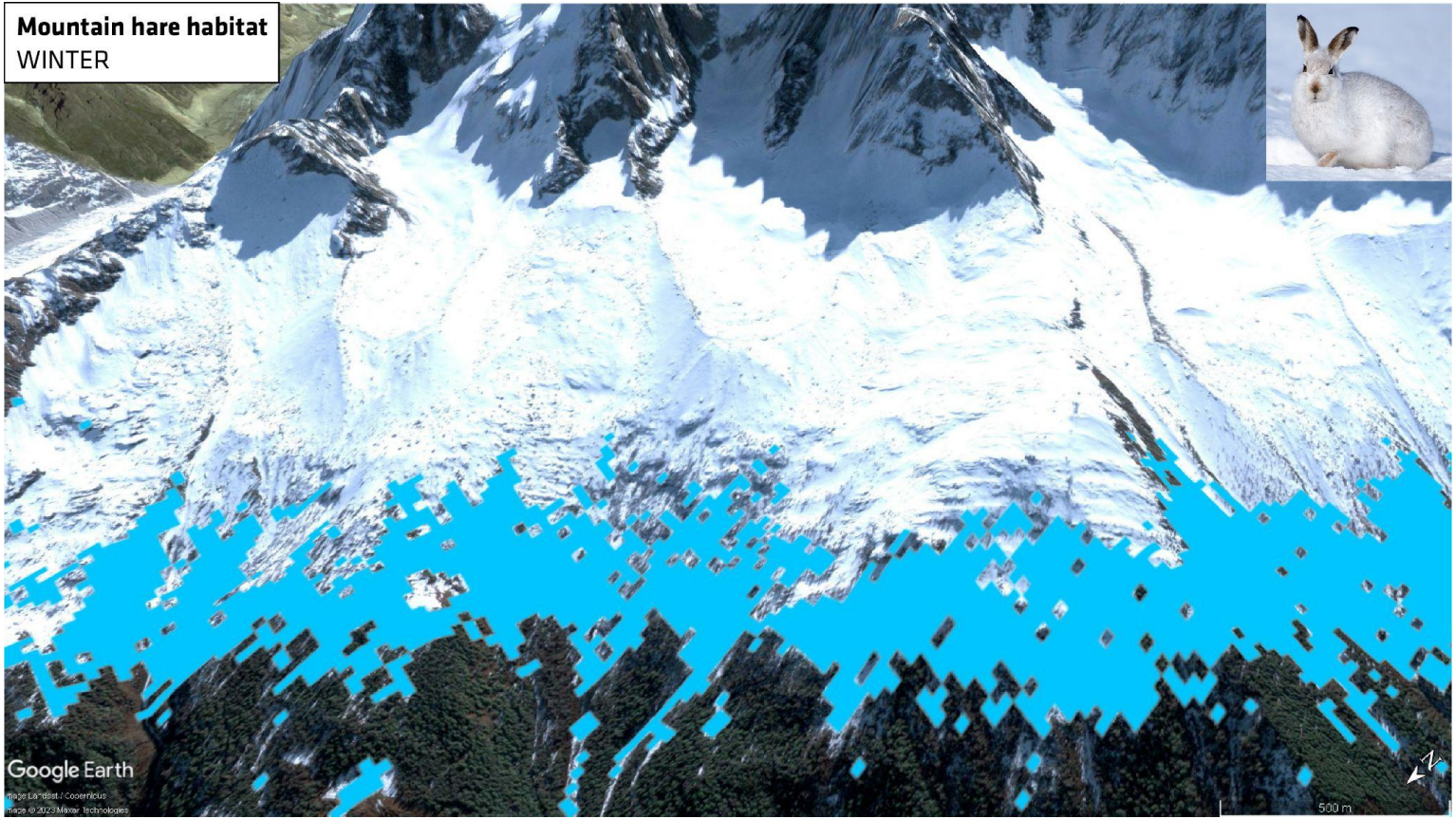

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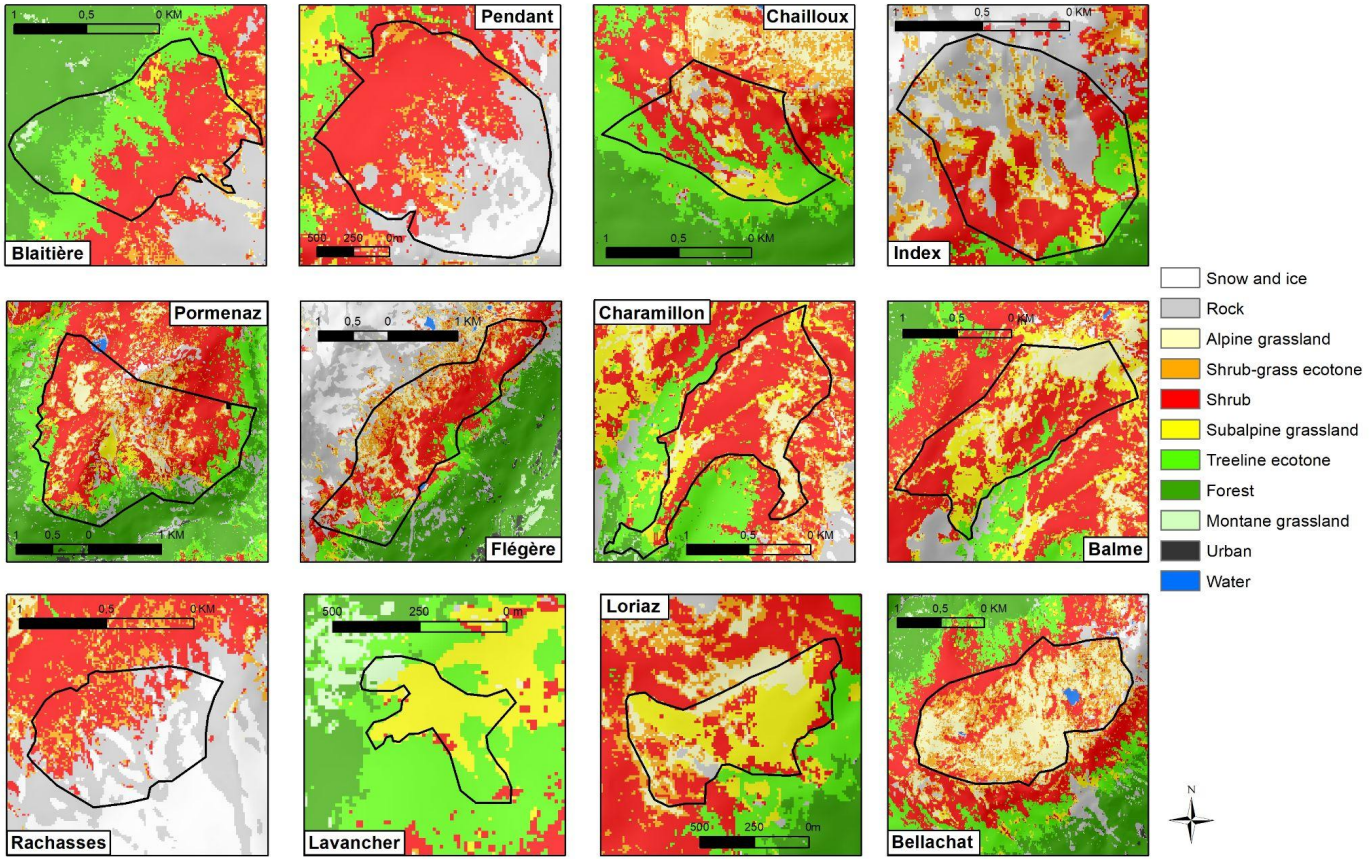

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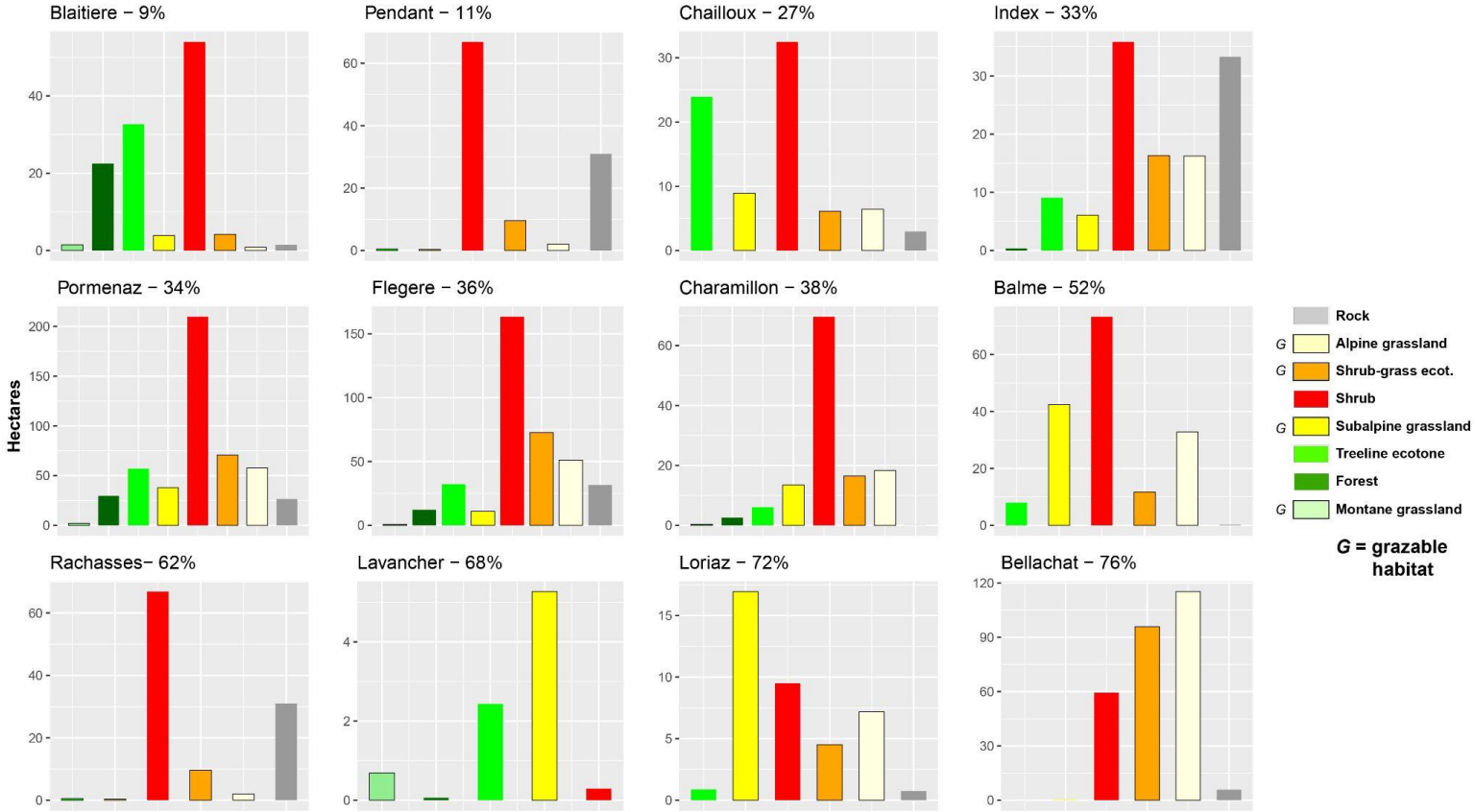
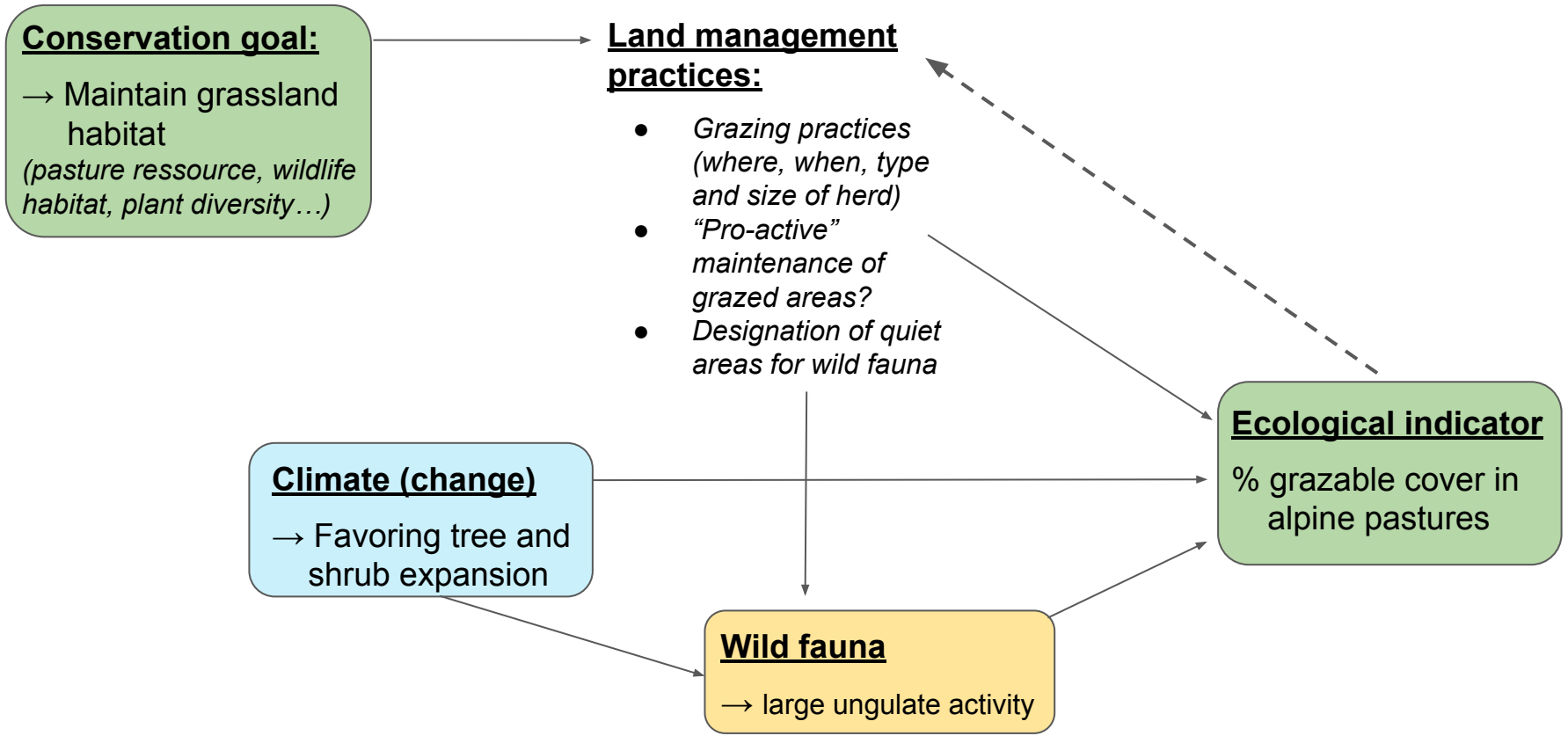
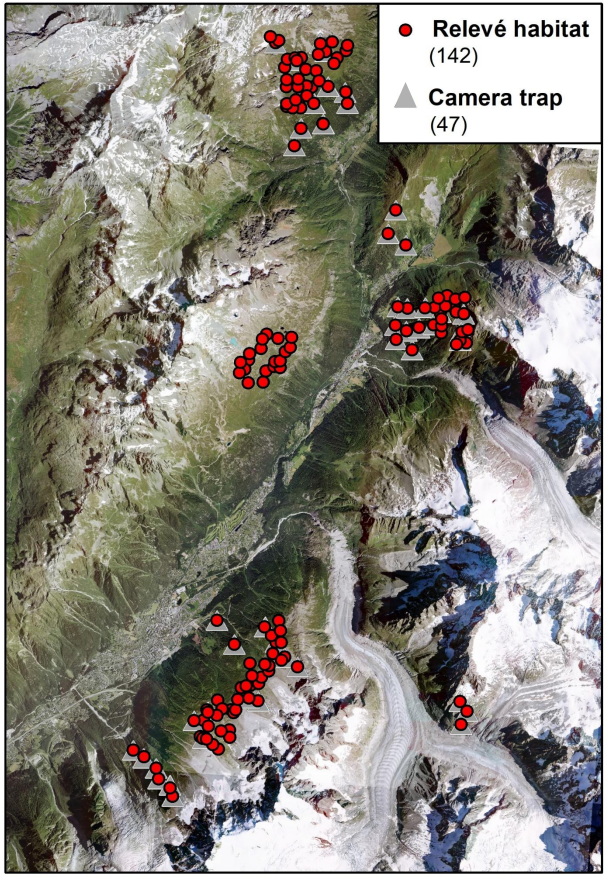


Conclusion: moving towards adaptive management

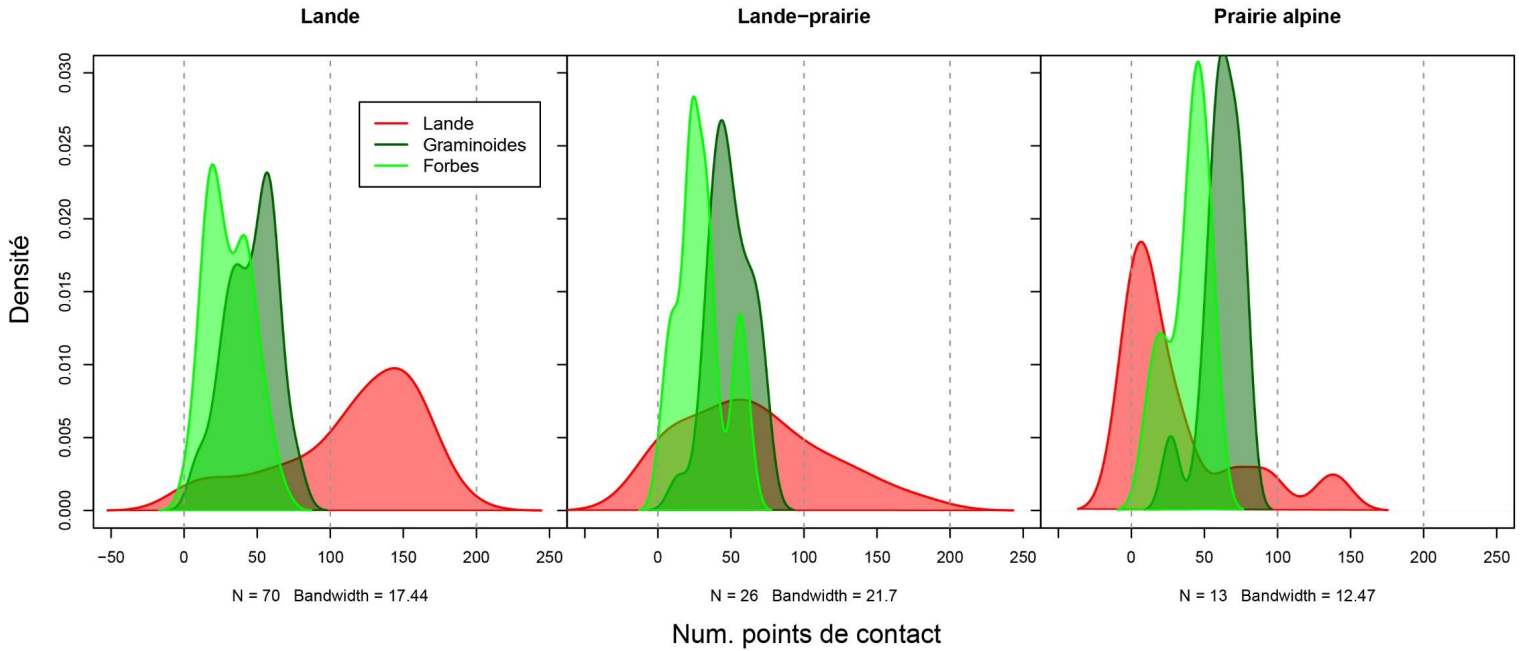


Thanks for listening - questions?

Une grande saison de terrain en 2022



WP1 – validation de l'outil habitat



→ Une cohérence entre classe d'habitat et l'abondance de différents groupes fonctionnels de végétation