

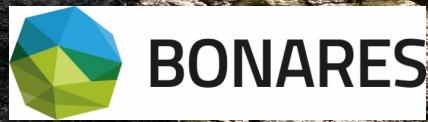
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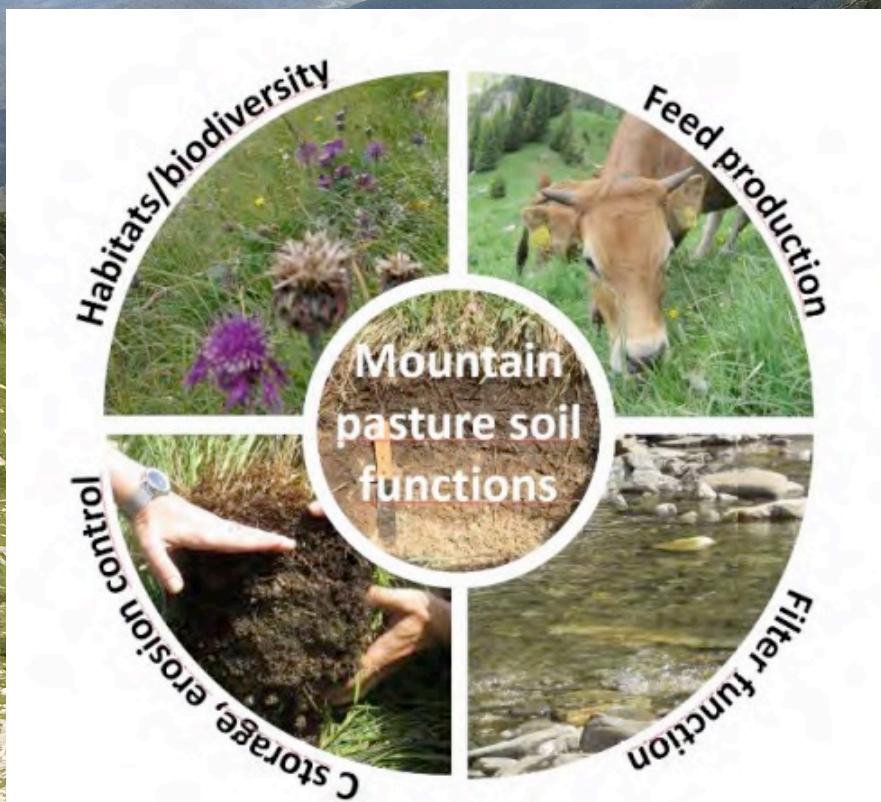
**Re-grazing of abandoned mountain pastures
to maintain soil functions and biodiversity?**

The case study „Brunnenkopfalm“



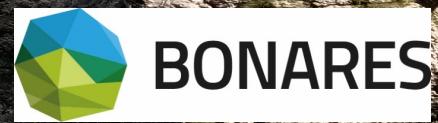
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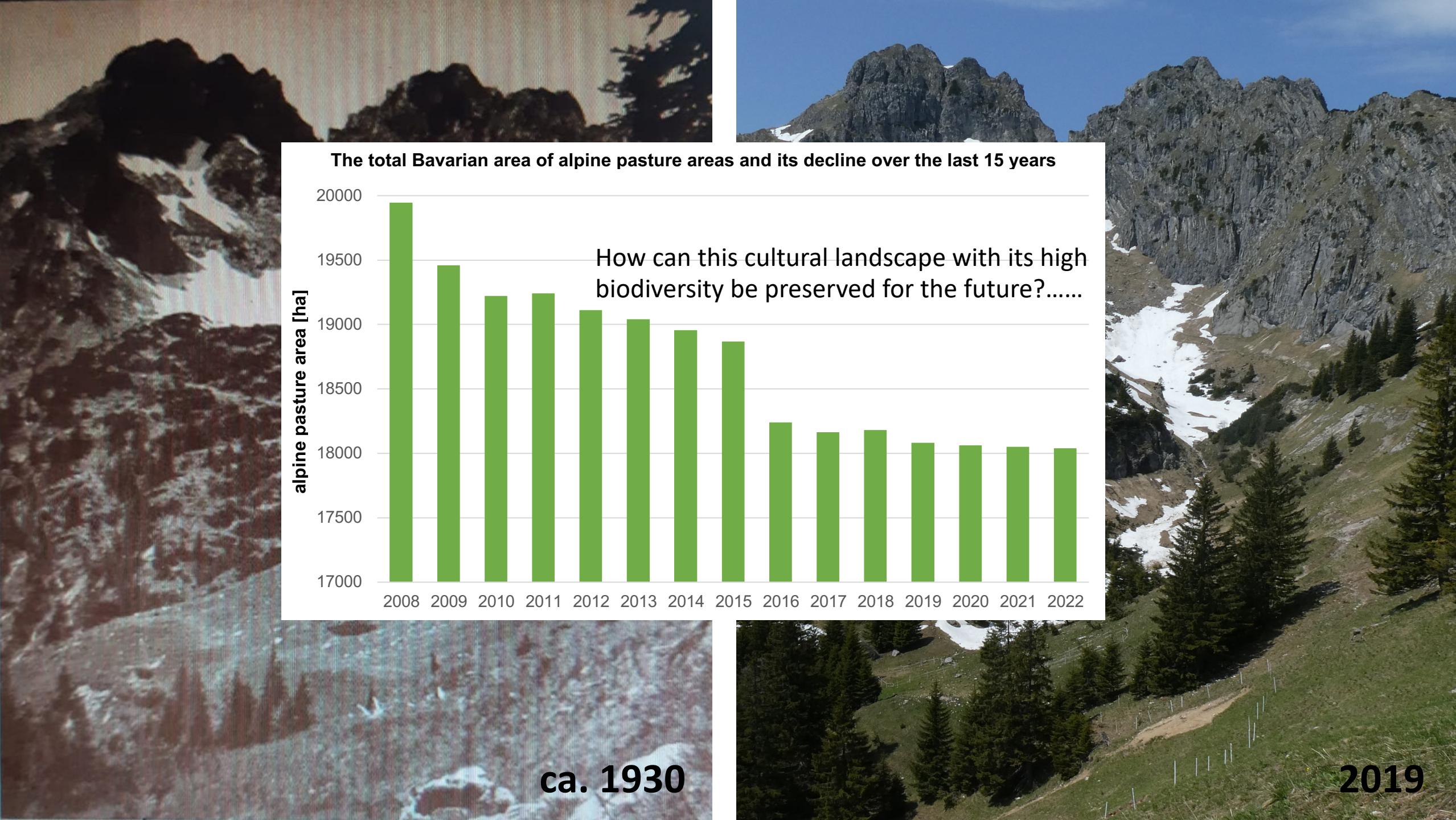
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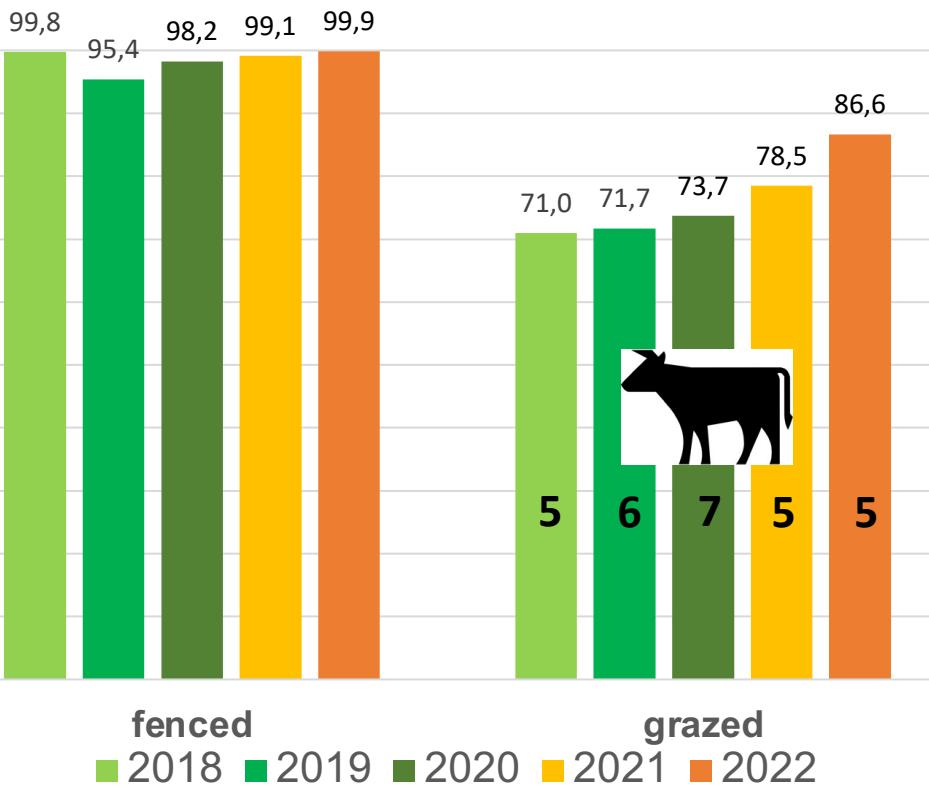
Does (re-)grazing have a positive or negative impact on species diversity and fodder quantity / quality?

What are impacts on soil C and N biogeochemistry and water quality in draining creeks?

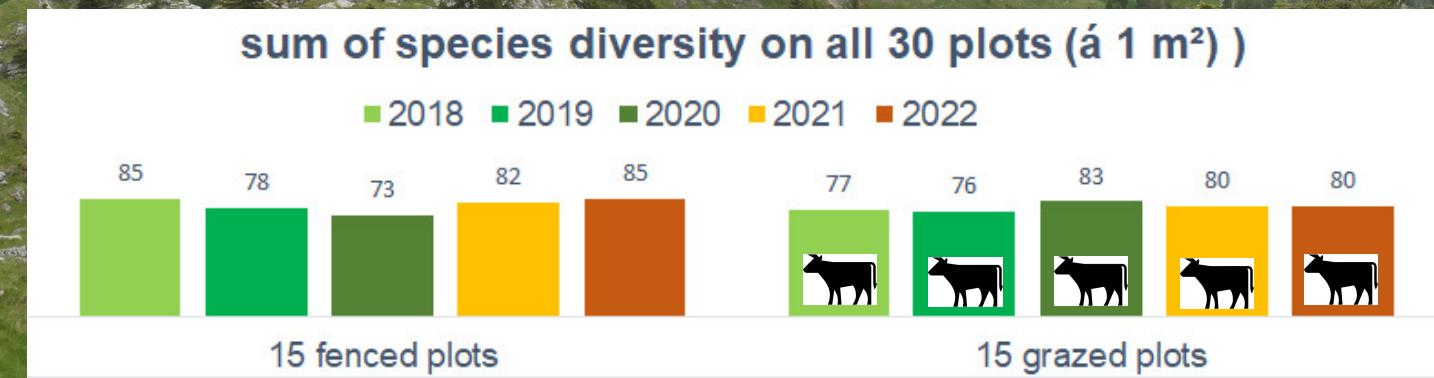


After 5 vegetation- and grazing seasons data illuminate first ecosystem responses but long term monitoring needed!

Vegetation Cover [%] on all 30 plots (á 1 m²)

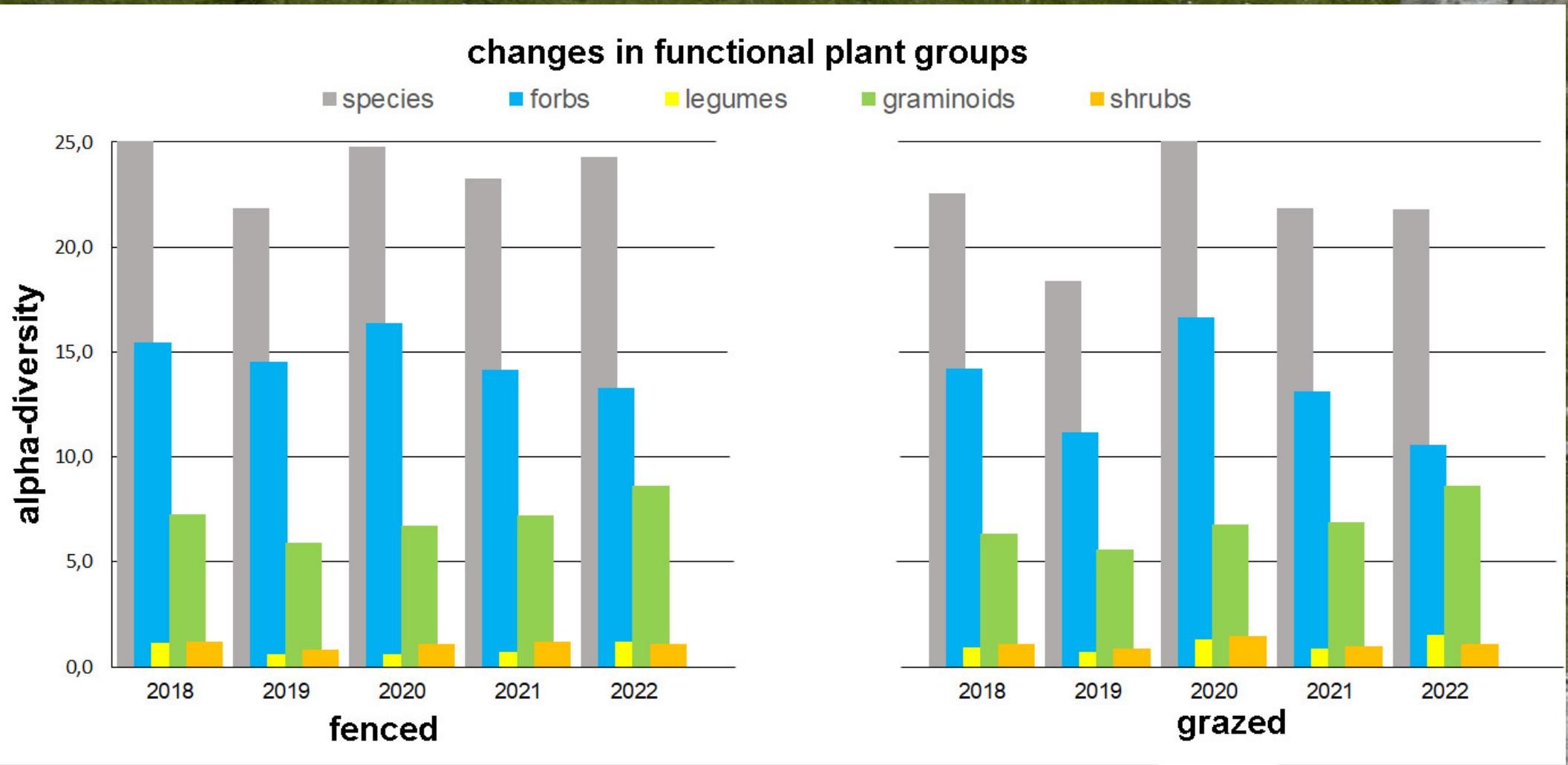


sum of species diversity on all 30 plots (á 1 m²)



average species diversity on all plots (á 1 m²)

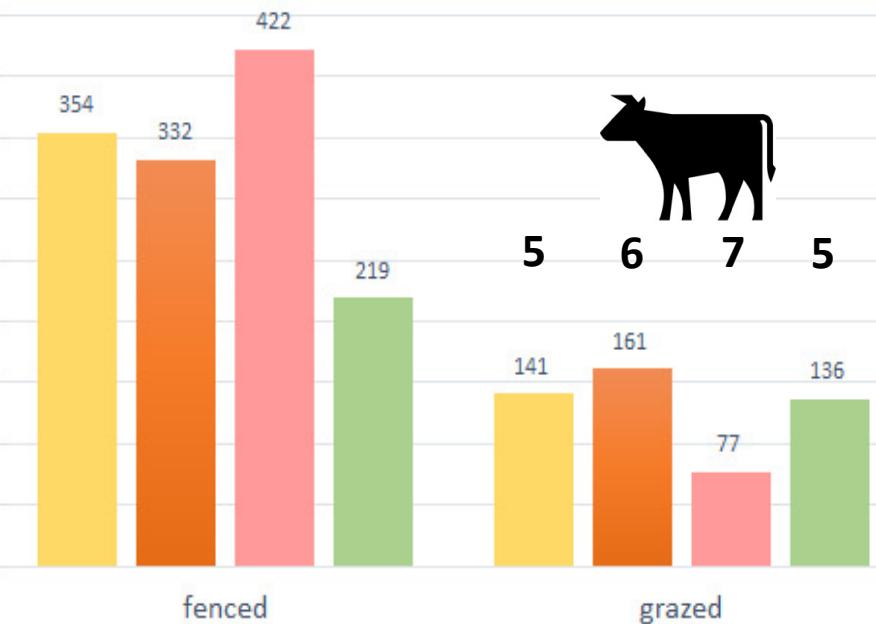






harvested dry Biomass of all plots (á 1 m²)

2018 2019 2020 2021



biomass from 2022 is still finally analysed

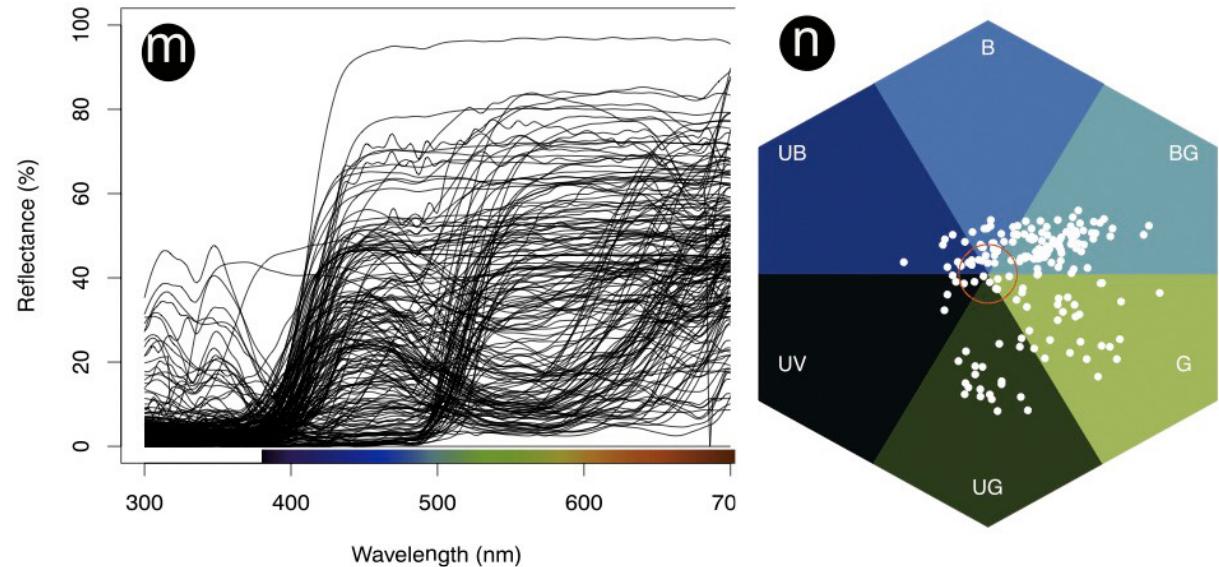
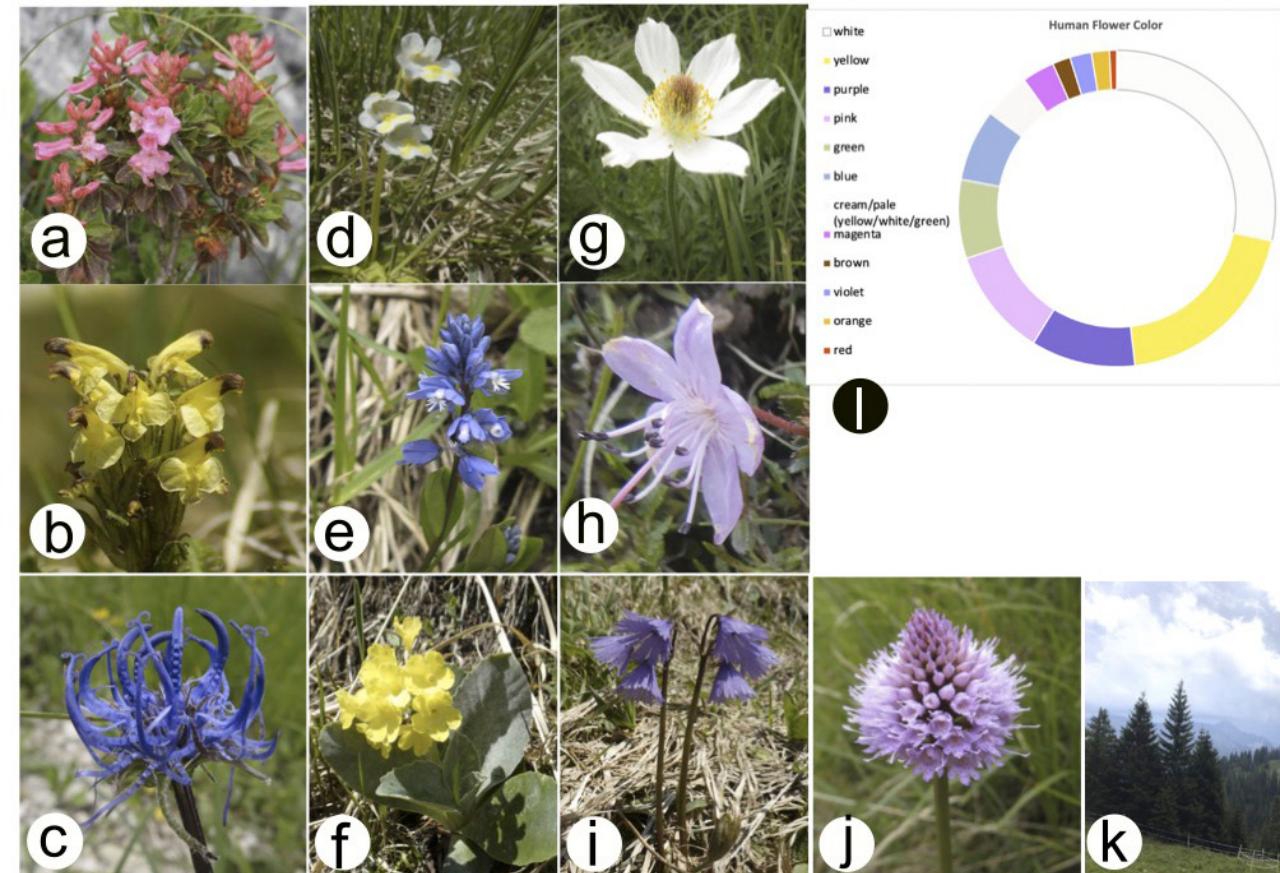
but this is without the regrowth effect !



We are not only interested in plant diversity and nice flowers

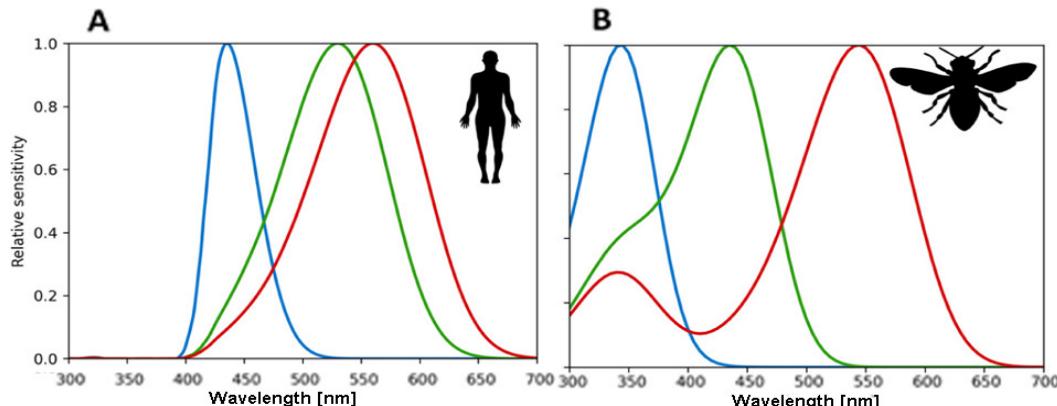


We are not only interested in plant diversity and nice flowers

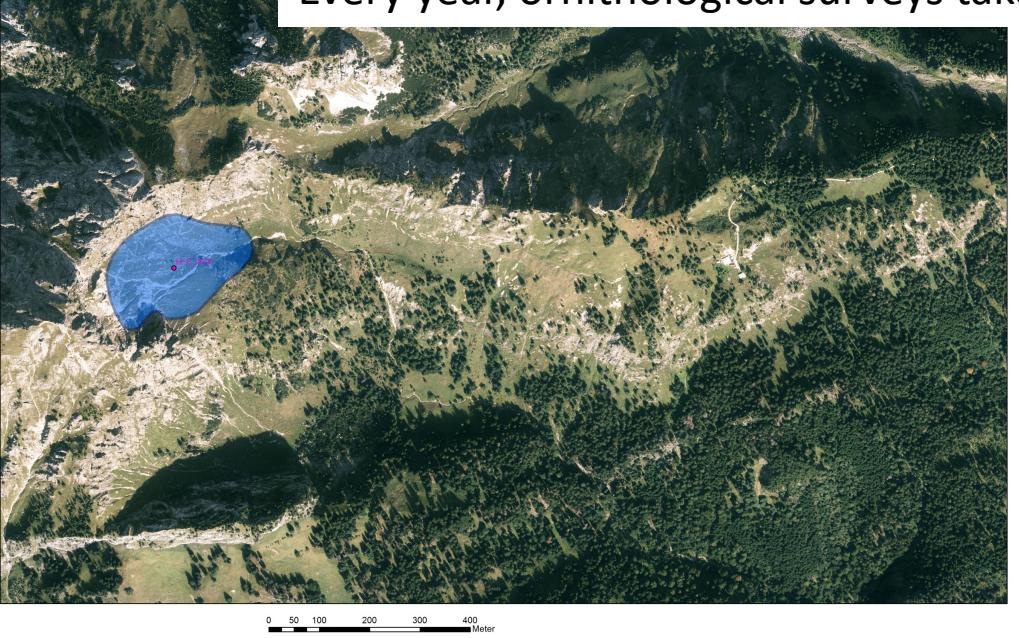


... but also in plant/**flower** - insect/**pollinator** interactions.

In this case, the spectral colours of the different flowers were analysed, as insects perceive flower colours and flower signals differently than we humans do. In this way, different habitats can also be compared from the perspective of pollinator insects and the group of all pollinator in this area can be represented more comprehensively.



Every year, ornithological surveys take place on the grazing area and in the immediate surroundings.

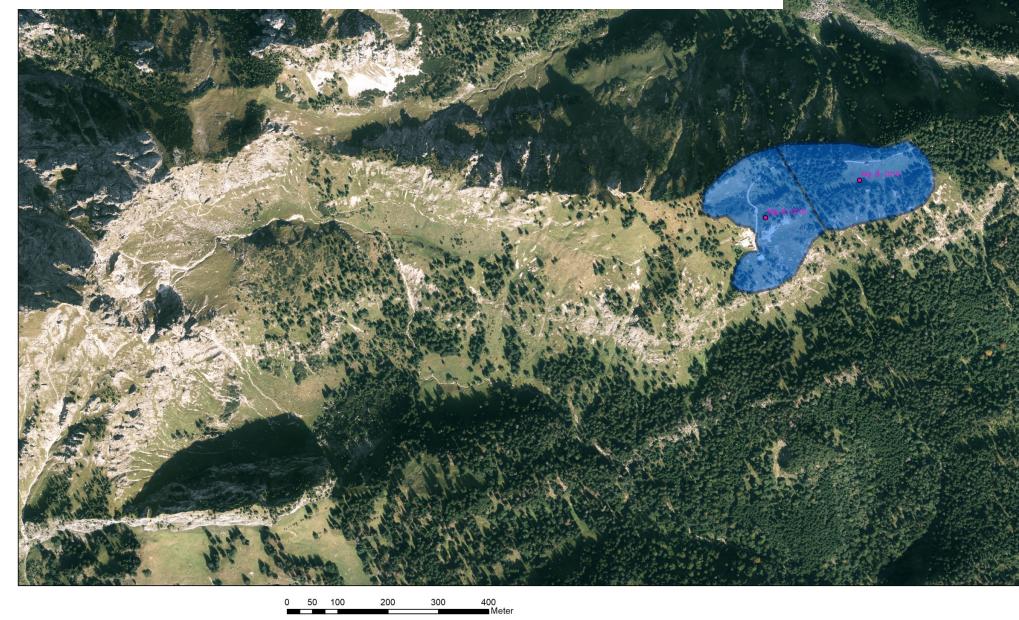


Ammergebirge, Brunnenkopfalm (SUSALPS-Projekt: Wiederbeweidung), Reviere: Hausrotschwanz

LIU, REF. 55, Vogelschutzwarte, Armin Görzen

30.06.2019

Scientific Name
<i>Prunella collaris</i>
<i>Pyrrhocorax graculus</i>
<i>Turdus merula</i>
<i>Anthus trivialis</i>
<i>Phylloscopus bonelli</i>
<i>Anthus spinoletta</i>
<i>Lyrurus tetrix</i> = <i>Tetrao tetrix</i>
<i>Fringilla coelebs</i>
<i>Garrulus glandarius</i>
<i>Loxia curvirostra</i>
<i>Phylloscopus trochilus</i>
<i>Pyrrhula pyrrhula</i>
<i>Picus canus</i>
<i>Tetrastes bonasia</i>
<i>Lophophanes cristatus</i>
<i>Phoenicurus ochruros</i>
<i>Prunella modularis</i>
<i>Sylvia curruca</i>
<i>Corvus corax</i>
<i>Cuculus canorus</i>
<i>Tichodroma muraria</i>
<i>Turdus viscivorus</i>
<i>Sylvia atricapilla</i>
<i>Turdus torquatus</i>
<i>Erithacus rubecula</i>
<i>Dryocopus martius</i>
<i>Turdus philomelos</i>
<i>Regulus ignicapilla</i>
<i>Nucifraga caryocatactes</i>
<i>Falco tinnunculus</i>
<i>Poecile montanus</i>
<i>Regulus regulus</i>
<i>Troglodytes troglodytes</i>
<i>Phylloscopus collybita</i>
<i>Carduelis citrinella</i>



Ammergebirge, Brunnenkopfalm (SUSALPS-Projekt: Wiederbeweidung), Reviere: Mönchsgrasmücke

LIU, REF. 55, Vogelschutzwarte, Armin Görzen

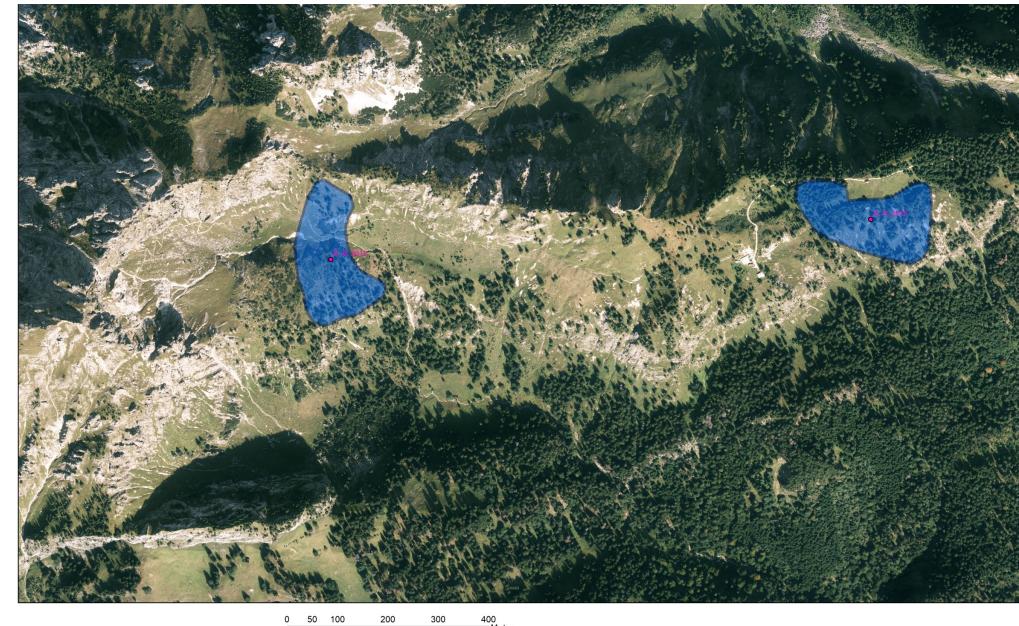
30.06.2019



Ammergebirge, Brunnenkopfalm (SUSALPS-Projekt: Wiederbeweidung), Reviere: Rotkehlchen

LIU, REF. 55, Vogelschutzwarte, Armin Görzen

30.06.2019



Ammergebirge, Brunnenkopfalm (SUSALPS-Projekt: Wiederbeweidung), Reviere: Zilpzalp

LIU, REF. 55, Vogelschutzwarte, Armin Görzen

30.06.2019

Butterflies and Rams

	Red Lists			Red Lists	
Scientific Name	D	By	Scientific Name	D	By
<i>Erynnis tages</i>		3	<i>Boloria euphrosyne</i>	2	2
<i>Pyrgus alveus</i>	2	2	<i>Boloria titania</i>	V	3
<i>Carterocephalus palaemon</i>			<i>Vanessa atalanta</i>		
<i>Ochlodes sylvanus</i>			<i>Vanessa cardui</i>		
<i>Leptidea</i> sp.			<i>Aglais io</i>		
<i>Anthocharis cardamines</i>			<i>Aglais urticae</i>		
<i>Pieris rapae</i>			<i>Euphydryas aurinia</i>	2	2
<i>Pieris napi</i>			<i>Melitaea diamina</i>	3	3
<i>Colias croceus</i>			<i>Limenitis camilla</i>	V	
<i>Gonepteryx rhamni</i>			<i>Lasiommata petropolitana</i>	3	
<i>Hamearis lucina</i>	3	2	<i>Lasiommata maera</i>		
<i>Lycaena tityrus</i>		2	<i>Coenonympha gardetta</i>	R	
<i>Cupido minimus</i>		3	<i>Erebia ligea</i>		
<i>Phengaris arion</i>	3	2	<i>Erebia euryale</i>		
<i>Polyommatus glandon</i>	R	R	<i>Erebia manto</i>	R	
<i>Polyommatus eumedon</i>	3	2	<i>Erebia pharte</i>		
<i>Polyommatus artaxerxes</i>	G	3	<i>Erebia aethiops</i>		
<i>Polyommatus semiargus</i>		V	<i>Erebia pronoe</i>		
<i>Polyommatus icarus</i>			<i>Erebia oeme</i>		
<i>Polyommatus coridon</i>		V	<i>Zygaena filipendulae</i>		
<i>Argynnис paphia</i>			<i>Adscita geryon</i>	3	3
<i>Argynnис aglaja</i>	V	V	<i>Euphydryas cynthia</i>		
<i>Argynnис adippe</i>	3	V	Total 45	18	19

Grasshoppers

	Red Lists	
Scientific Name	D	By
<i>Metrioptera brachyptera</i>		V
<i>Metrioptera roeselii</i>		
<i>Pholidoptera aptera</i>		
<i>Tettigonia cantans</i>		
<i>Tetrix bipunctata</i>		
<i>Miramella alpina</i>	V	
<i>Euthystira brachyptera</i>		
<i>Gomphocerippus rufus</i>		
<i>Gomphocerus sibiricus</i>		
<i>Omocestus viridulus</i>	V	
<i>Chorthippus biguttulus</i>		
<i>Chorthippus parallelus</i>		
Total 12	1	2

other groups observed

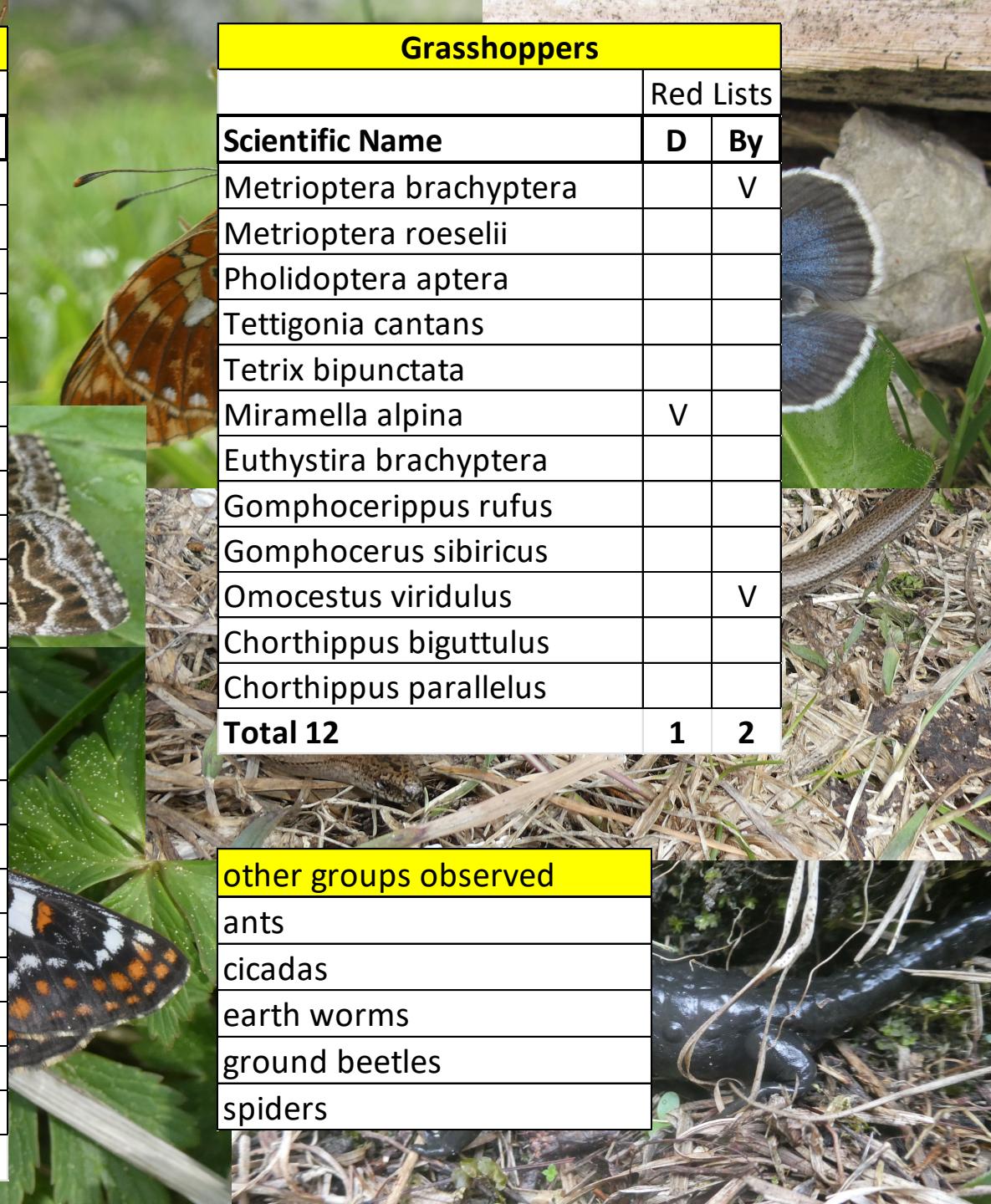
ants

cicadas

earth worms

ground beetles

spiders



Assessing heterogenous grazing effects on soil by use of UAV

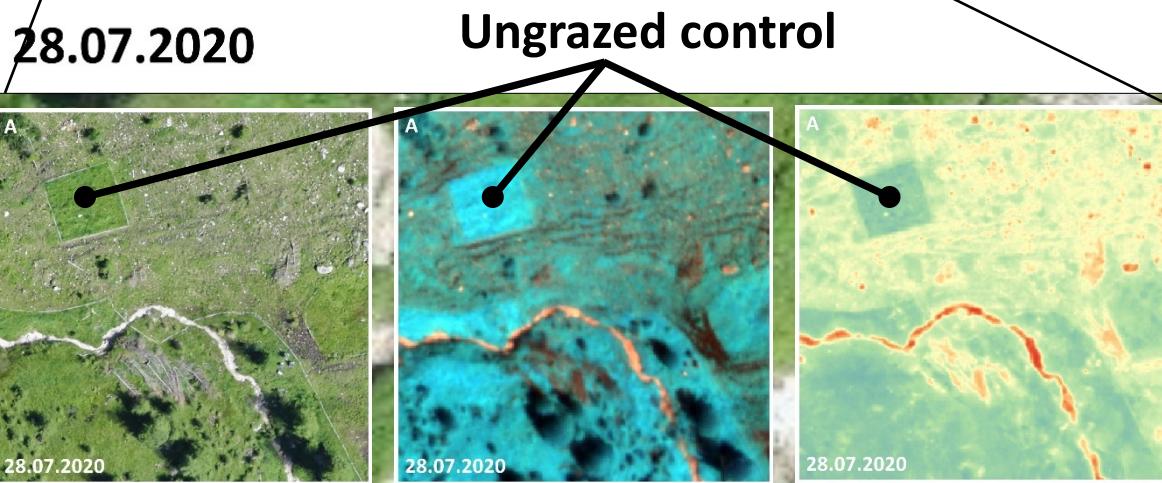
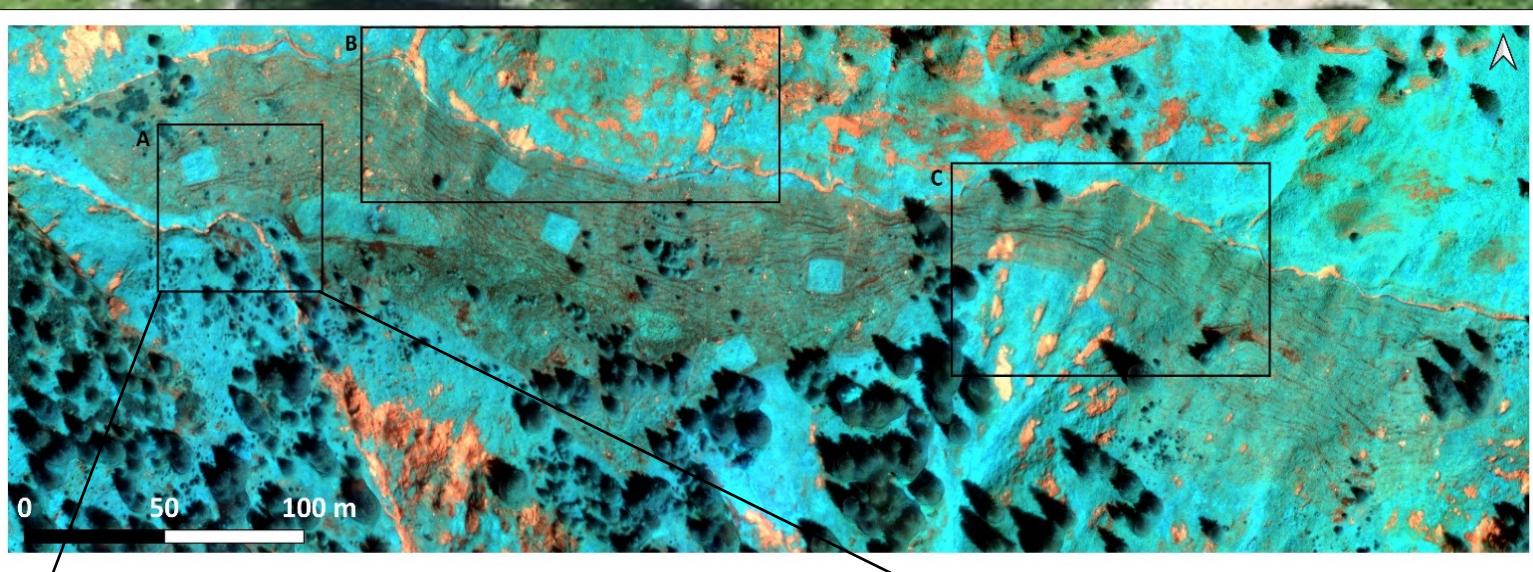


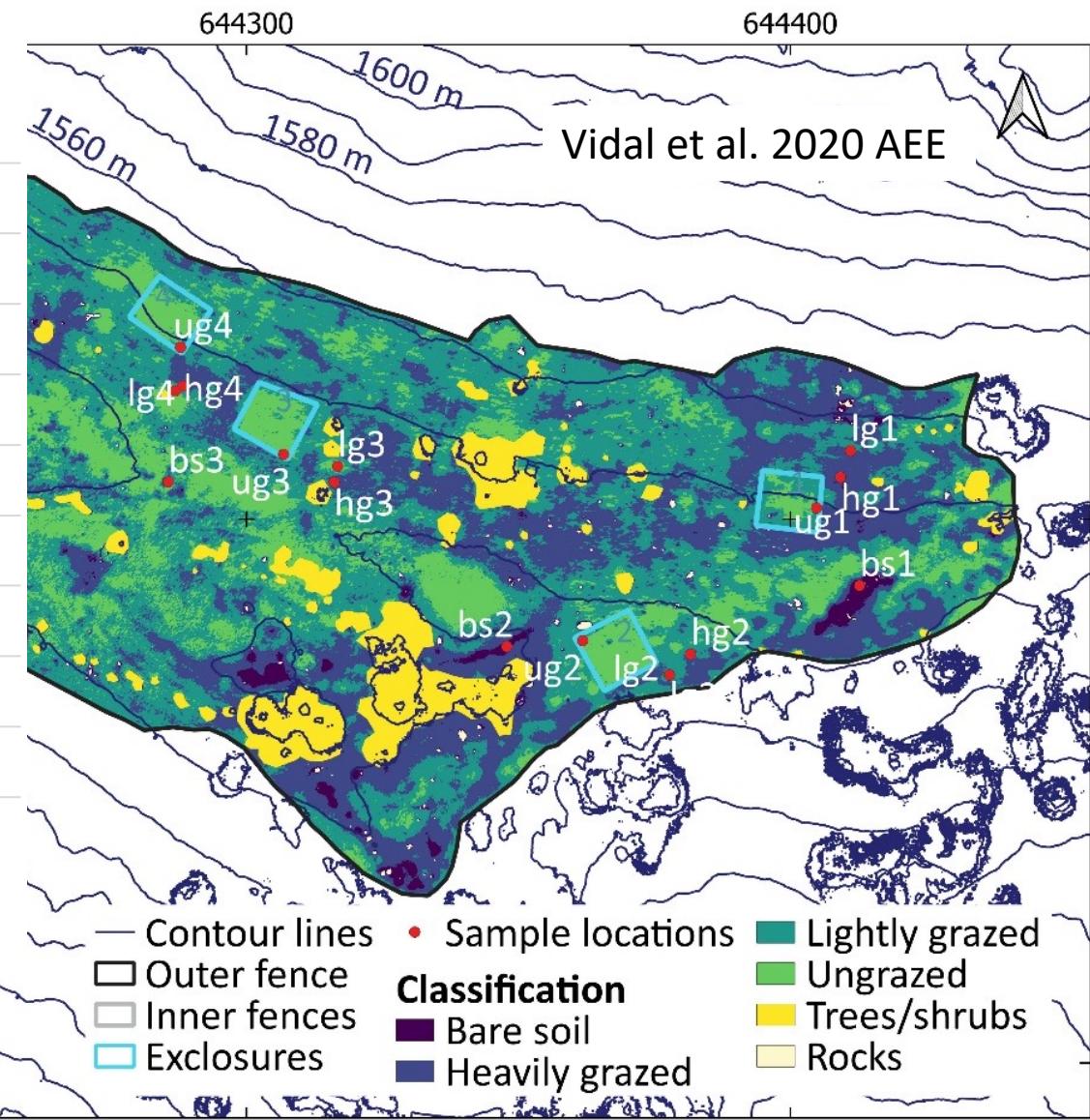
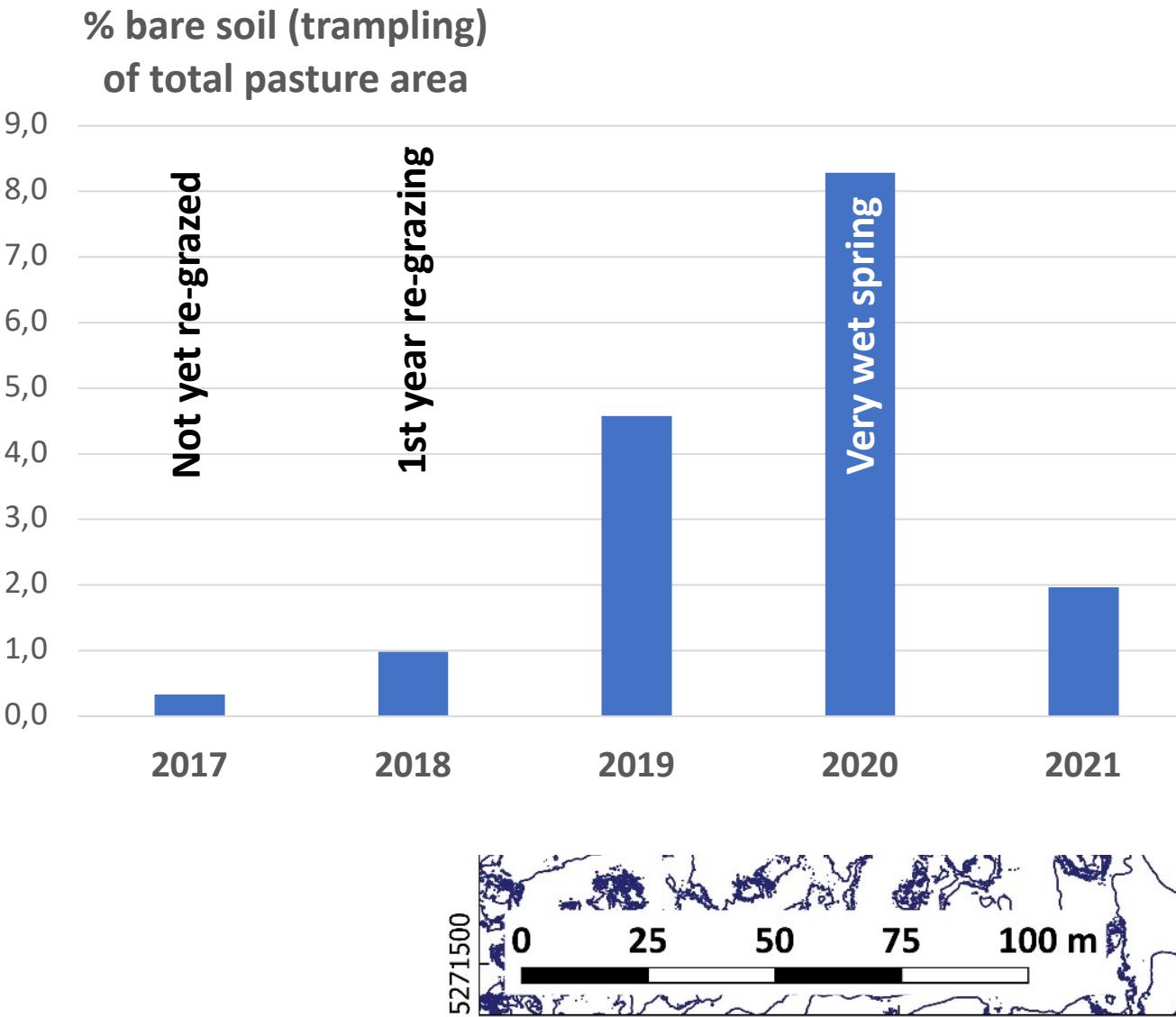
Figure 6. RGB (left), false colour (centre) and NDVI images (right) of the focus region C

28.07.2020

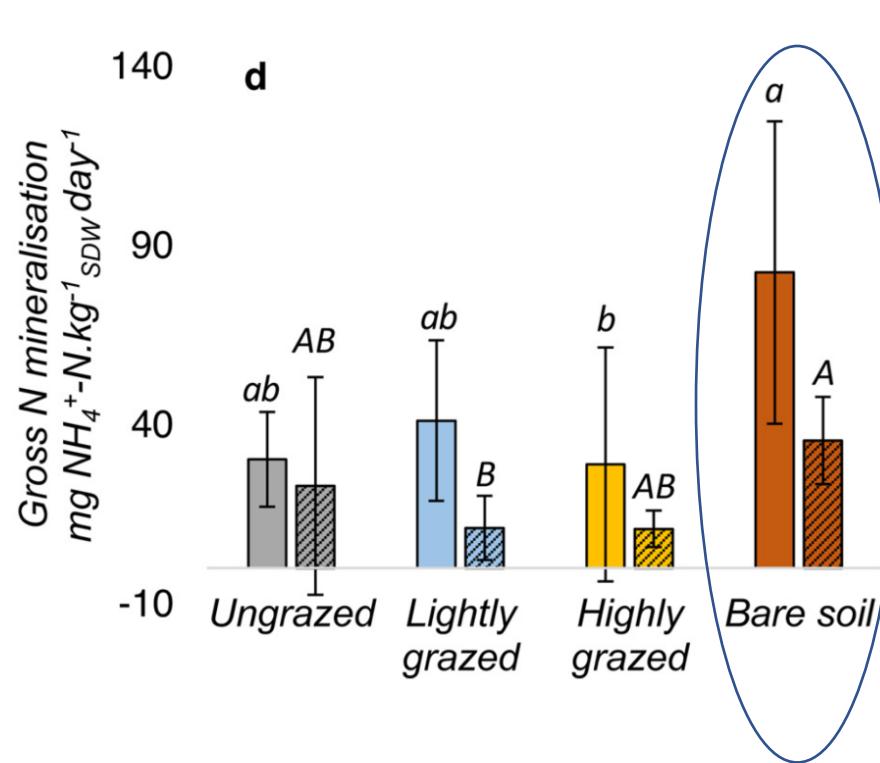
Grazing intensity classes



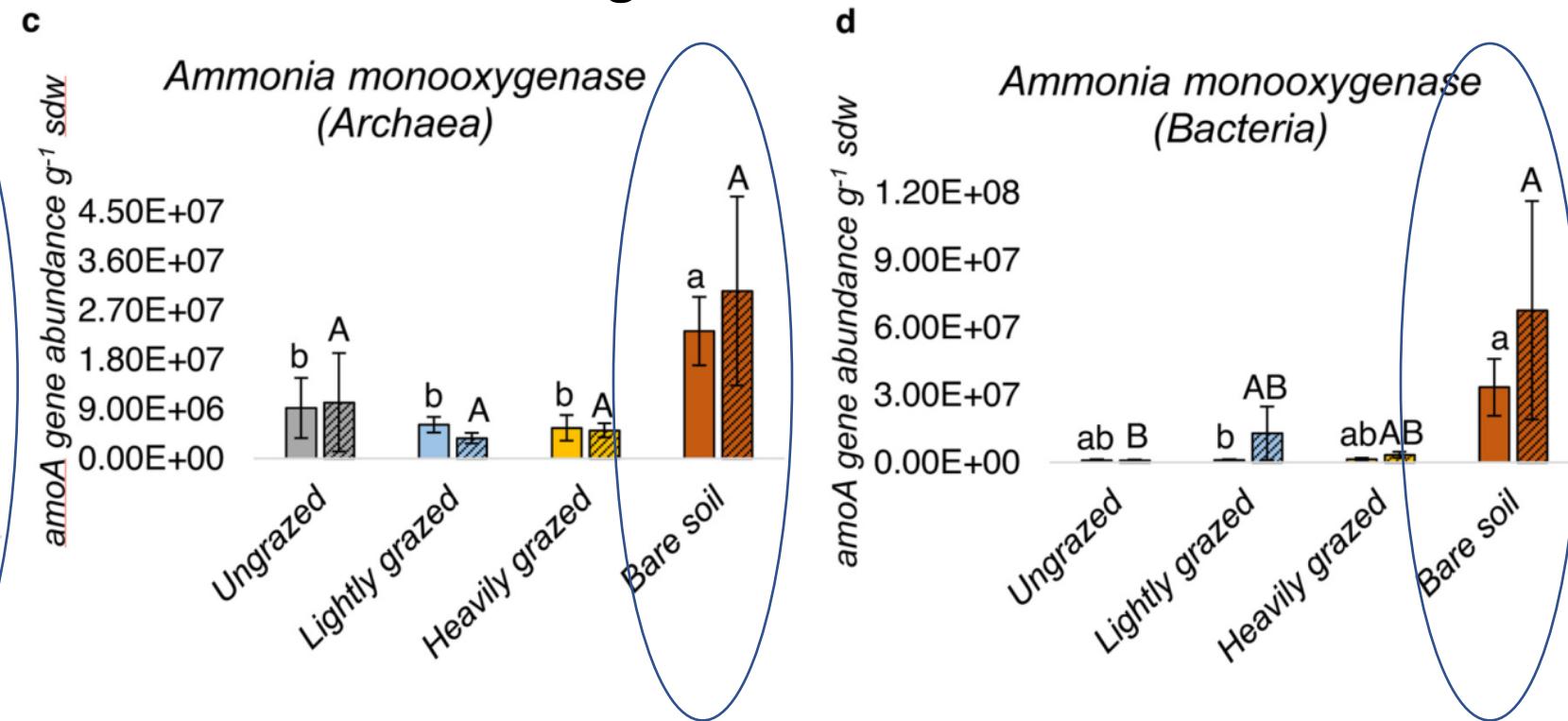
Grazing intensity distribution (2018)



Gross N mineralization



Nitrifier gene abundance in soil



Increased nitrogen turnover only in the grazing intensity class „bare soil“

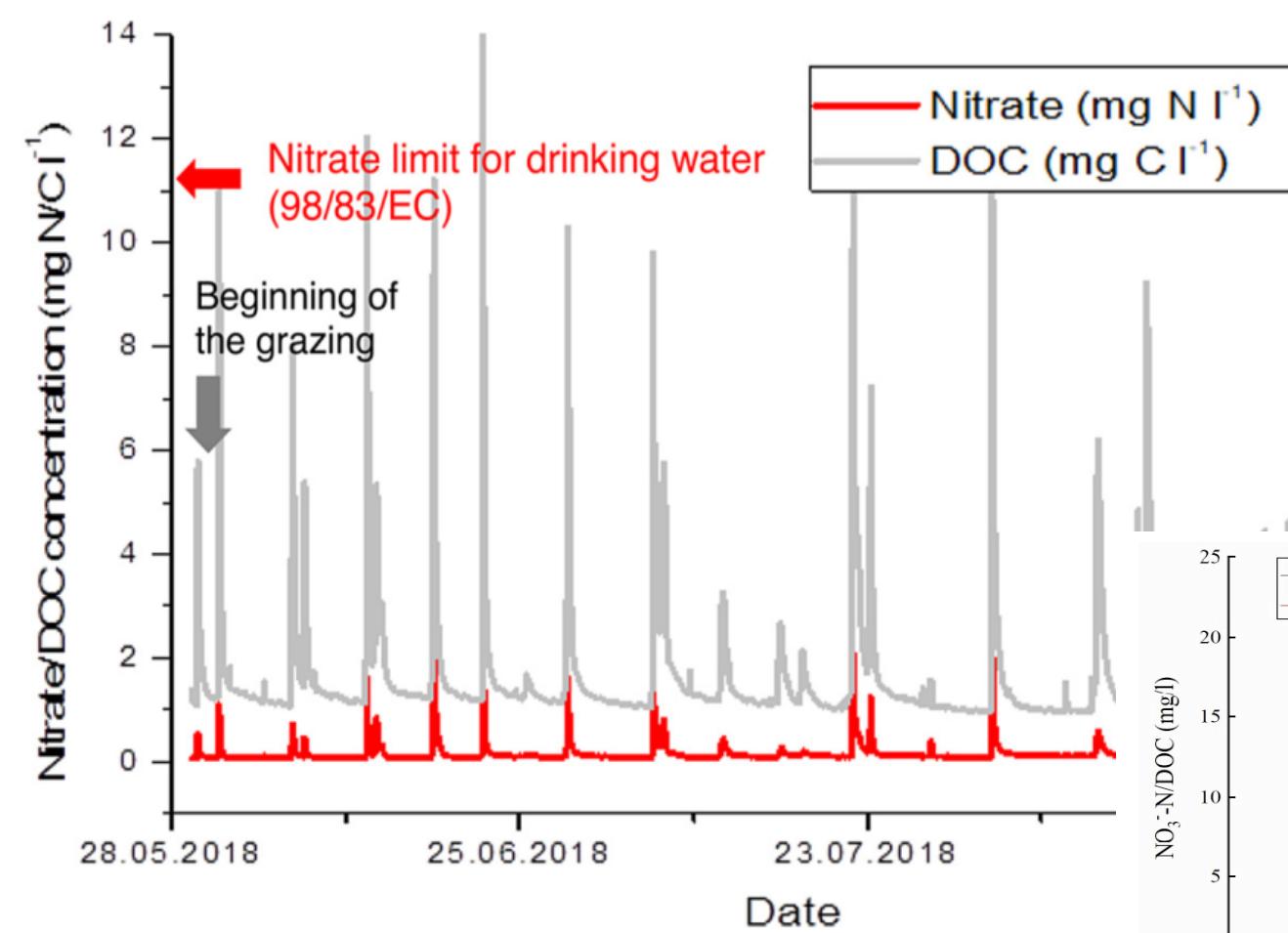
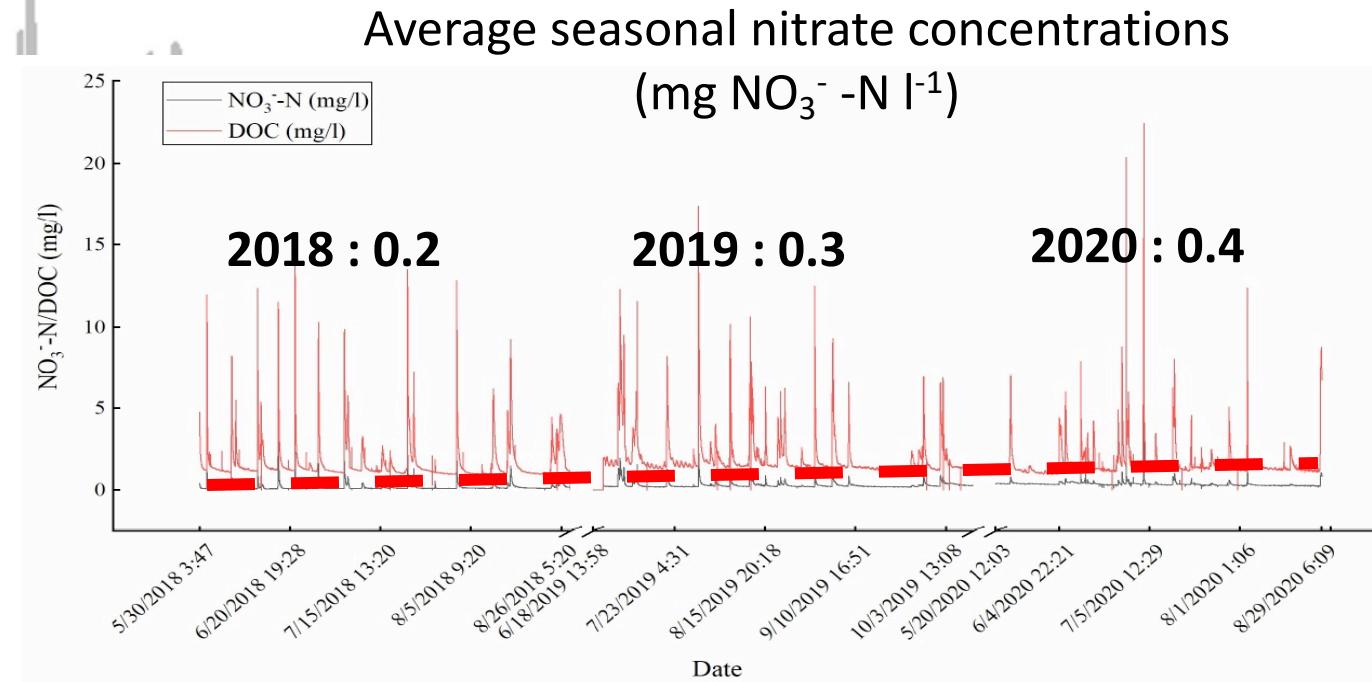


Fig. 7. Nitrate and dissolved organic carbon (DOC) concentration i

Very low nitrate concentrations due to the high filter capacity of pasture soils
Increases only after heavy precipitation events
DOC shows similar behaviour



Re-grazing Brunnenkopfalm 60 years after abandonment: in a nutshell



The SUSALPS re-grazing experiment has been attracting large interest by stakeholders, conservationists, external research partners and the general public

Re-grazing stops forest regrowth with neutral to positive effects on soil functions and biodiversity *in the first years*

Thanks! Merci! Grazie! Danke!

