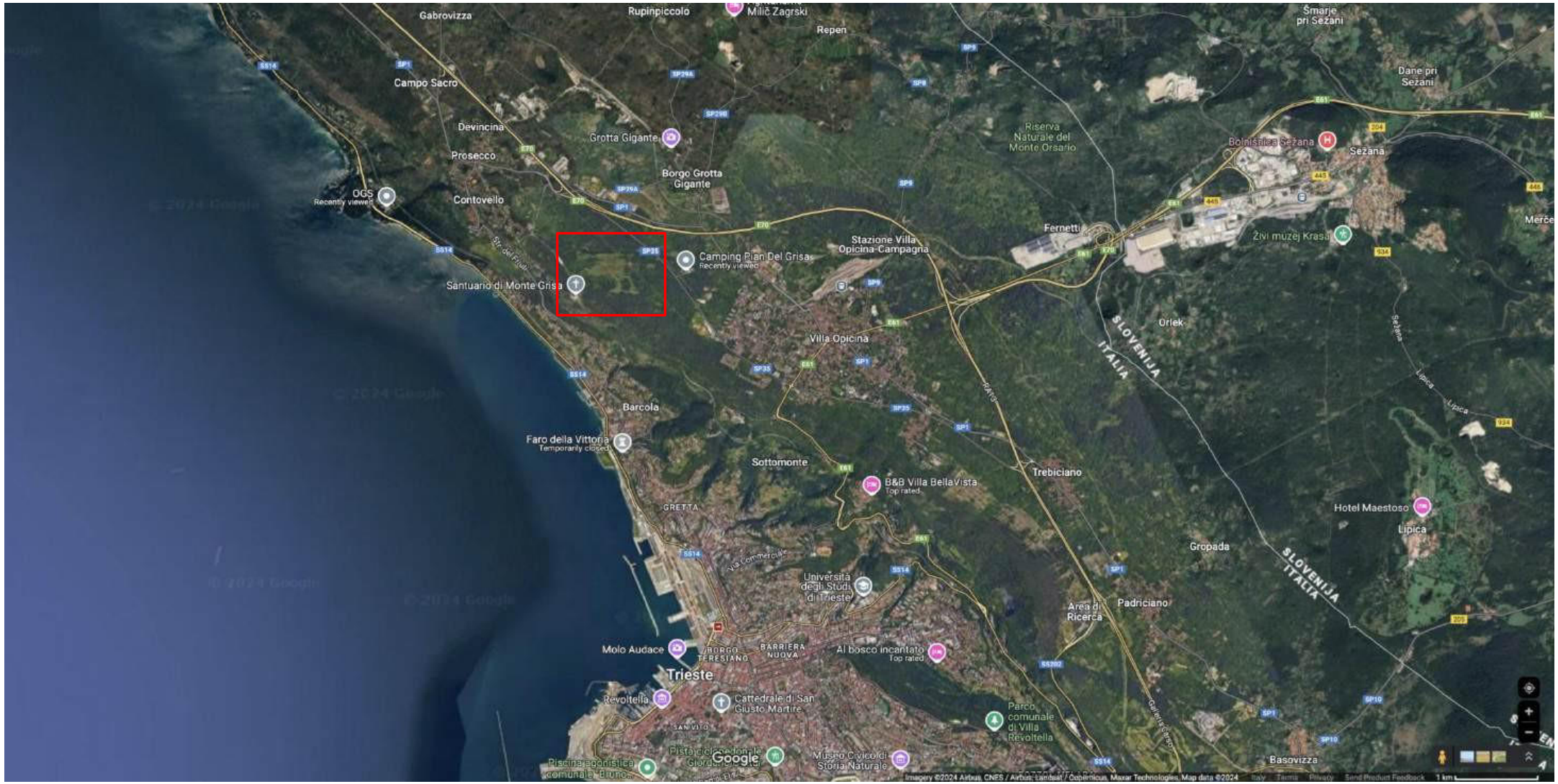
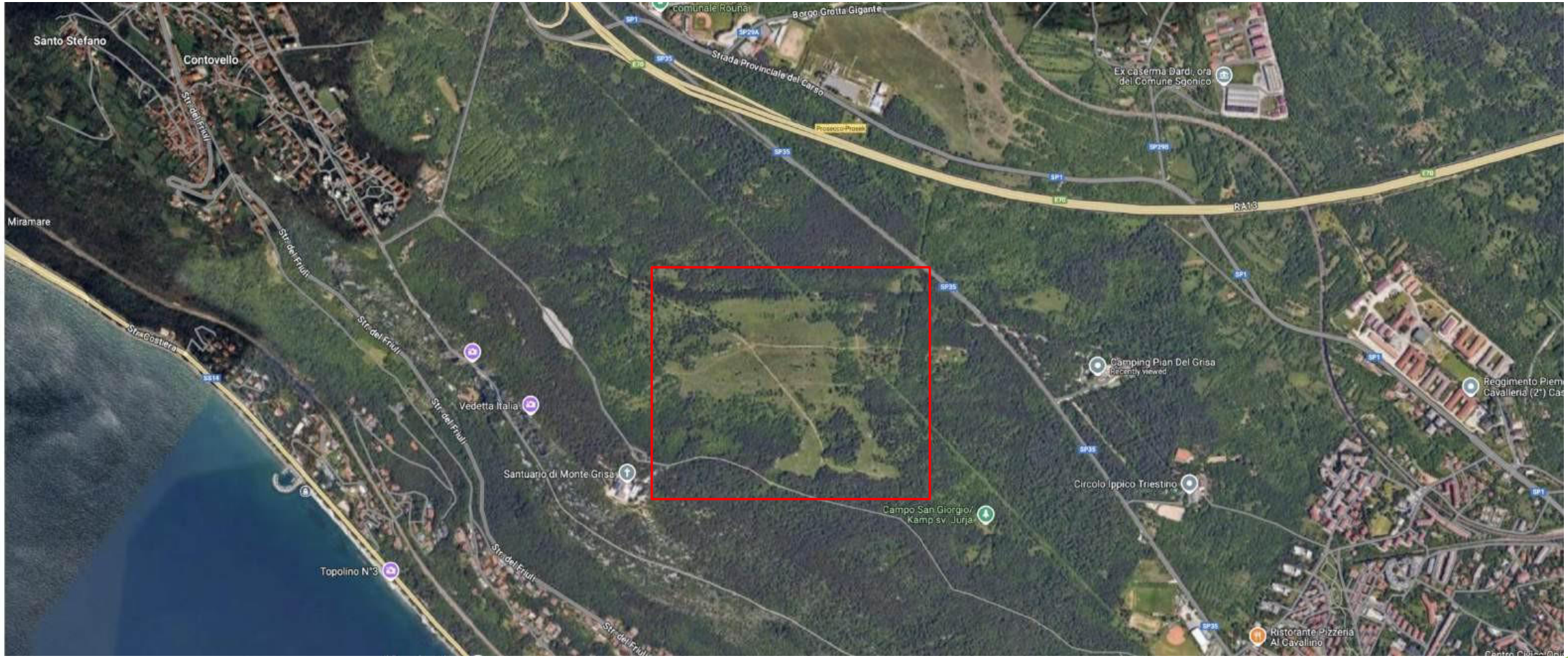
SAVE THE GRASSLAND: ENHANCING BIODIVERSITY OF A THREATENED KARSIC HABITAT

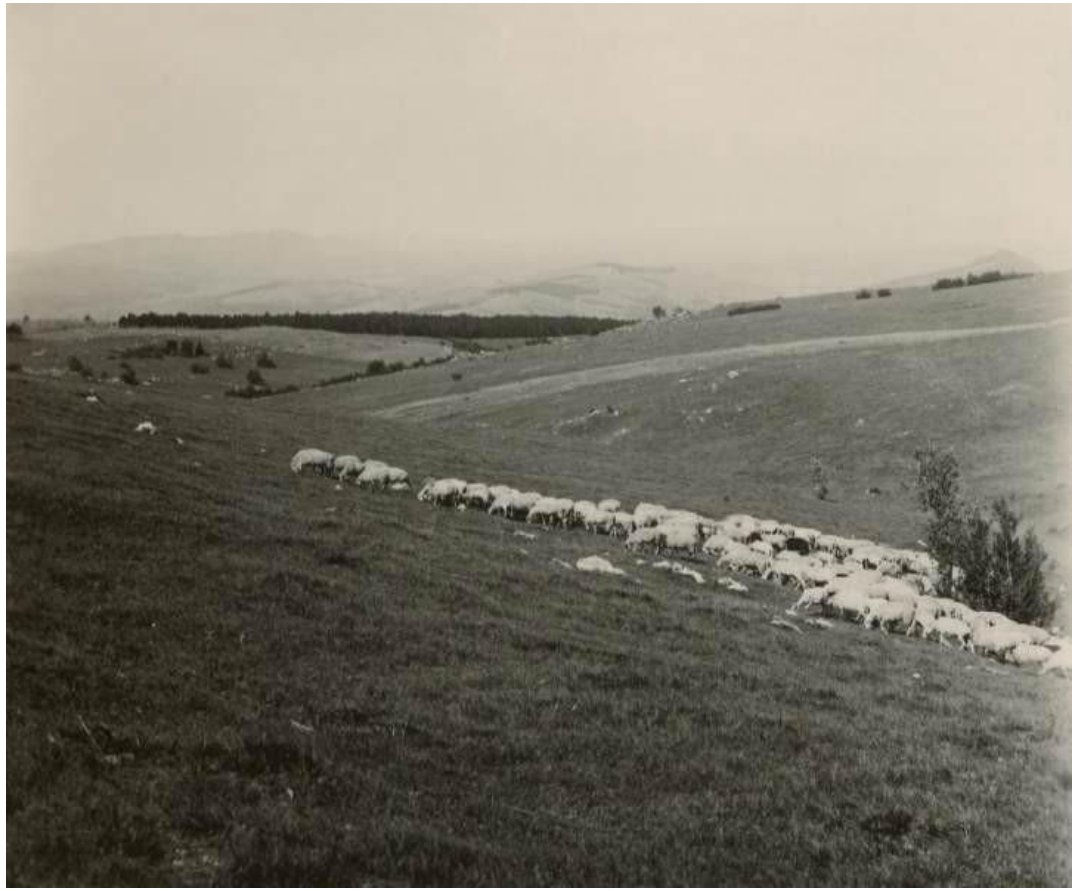
PP13
WWF Italy Foundation
Miramare Marine Protected Area
www.ampmiramare.it



Pilot study area: Pian del Grisa 45°41'48.3"N 13°45'29.0"E


Santo Stefano
Contovello
Miramare
Str. del Friuli
Str. Costiera
SS14
Strada Provinciale del Carso
Borgo Grotta Gigante
SP1
SP35
SP298
E70
RA13
Ex caserma Dardi, ora del Comune Sgonico
Camping Pian Del Grisa
Recently viewed
Vedetta Italia
Santuario di Monte Grisa
Campo San Giorgio/ Kamp sv. Jurja
Circolo Ippico Triestino
Topolino N°3
Ristorante Pizzeria Al Cavallino

Karst grassland: its origins and ancient uses



Auremiano - Sheep grazing (SLO) - Archivio Caldart 1930

Divacia (SLO) - Haymaking - Archivio Caldart 1930

Sgonico (Trieste Province) - Grazing land improvement actions - Archivio Caldart 1930

Black pine and smoke tree bush on Karst grassland - Archivio Caldart 1930

Black pine and smoke tree bush in the pilot study area - 2024

Trebiciano (Trieste Province) - Archivio Corpo Forestale Regionale FVG

Dolina – cattle grazing - Archivio Caldart 1930

THE KARSIC LANDA HISTORY

DEFORESTATION

PASTURE

THE KARSIC LANDA HISTORY

The landa is zoogenic in origin, the result of the grazing pressure, mainly of sheep and goats, exercised for centuries on deforested areas. Its formation seems to have already begun by the Bronze Age (5,500 - 3,200 years ago) with a rise in pastoral activity to which the Karst was subject.

This grazing activity led to the development of a vegetation capable of withstanding trampling and browsing, forming a low discontinuous cover, interspersed with the rocky outcrops and growing on a primitive, shallow soil.

THE KARSIC LANDA HISTORY

After the reforestation plan of the Austrian Empire, they used the Pinus nigra (Austrian pine or black pine), a pioneer species, to reforest the karsic surface.

THE KARSIC LANDA HYSTORY

In ancient times the landa extended across large areas, but at the present time, in which pastoralism is now very rarely practiced, we are witnessing a contraction in the area of this habitat as a result of the natural process of scrubbing over.

In these arid grasslands there are numerous endemic species and subspecies such as the Tommasini's Cinquefoil (Potentilla tommasiniana) or the tergestina subspecies of the Spring Gentian (Gentiana verna).

THE KARSIC LANDA

Class ***Festuco-Brometea***: xeric (dry) and mesoxeric (semi-dry) grasslands

Order ***Scorzoneretalia villosae*** **(62A0)**: Eastern sub-mediterranean dry grasslands

(Alleanza) ***Satureion subspicatae***: Xerophilous and rupicolous grasslands from the North Adriatic to SE Alps

Association ***Genisto sericeae-Seslerietum juncifoliae*** **(62A0a)**: primary grasslands on calcareous soils, sloping and wind exposed areas

→ Association ***Chrysopogono-Centaureetum cristatae*** **(62A0b)**: Xerophilous grasslands of East Adriatic with marked thermophilicity and significant component of mediterranean species

→ Association ***Carici humulis-Centaureetum rupestris*** **(62A0b)**: Xerophilous grasslands of East Adriatic and the inner Karst, more distant from the sea and with maximum concentration of illyrian species

(Alleanza): ***Scorzonerion villosae***: Meso-xerophilous Illyrian grasslands on sub-acidic soils

Association ***Danthonio-Scorzoneretum villosae*** **(62A0c)**: meadows and pastures on red soil

THE KARSIC LANDA

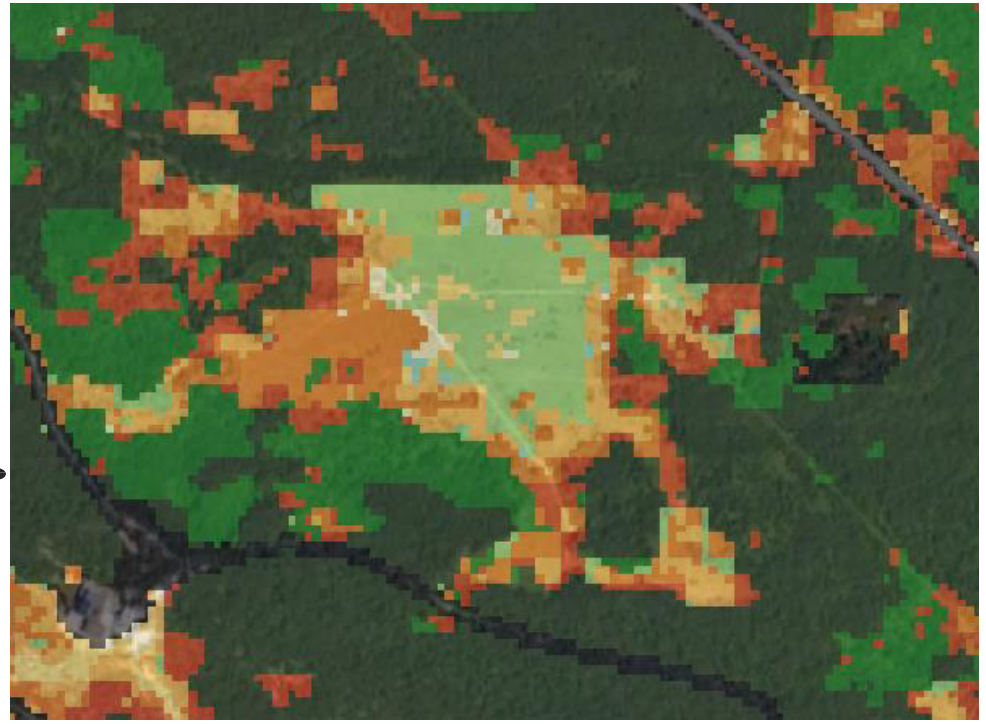
Hypothesis: based on preliminary observations the «landa» of the Monte Grisa should belong to «***Carici-Centaureetum***», the typical association of the Trieste Karst, but could display more termophilous component.

It will be significant the study of the flowering seasons, because in the *Carici- Centaureetum* is approximately constant from the spring to the autumn;

instead mediterranean plant associations have two maxima of flowering in autumn (most of all) and in spring, with a decrease in the summer.

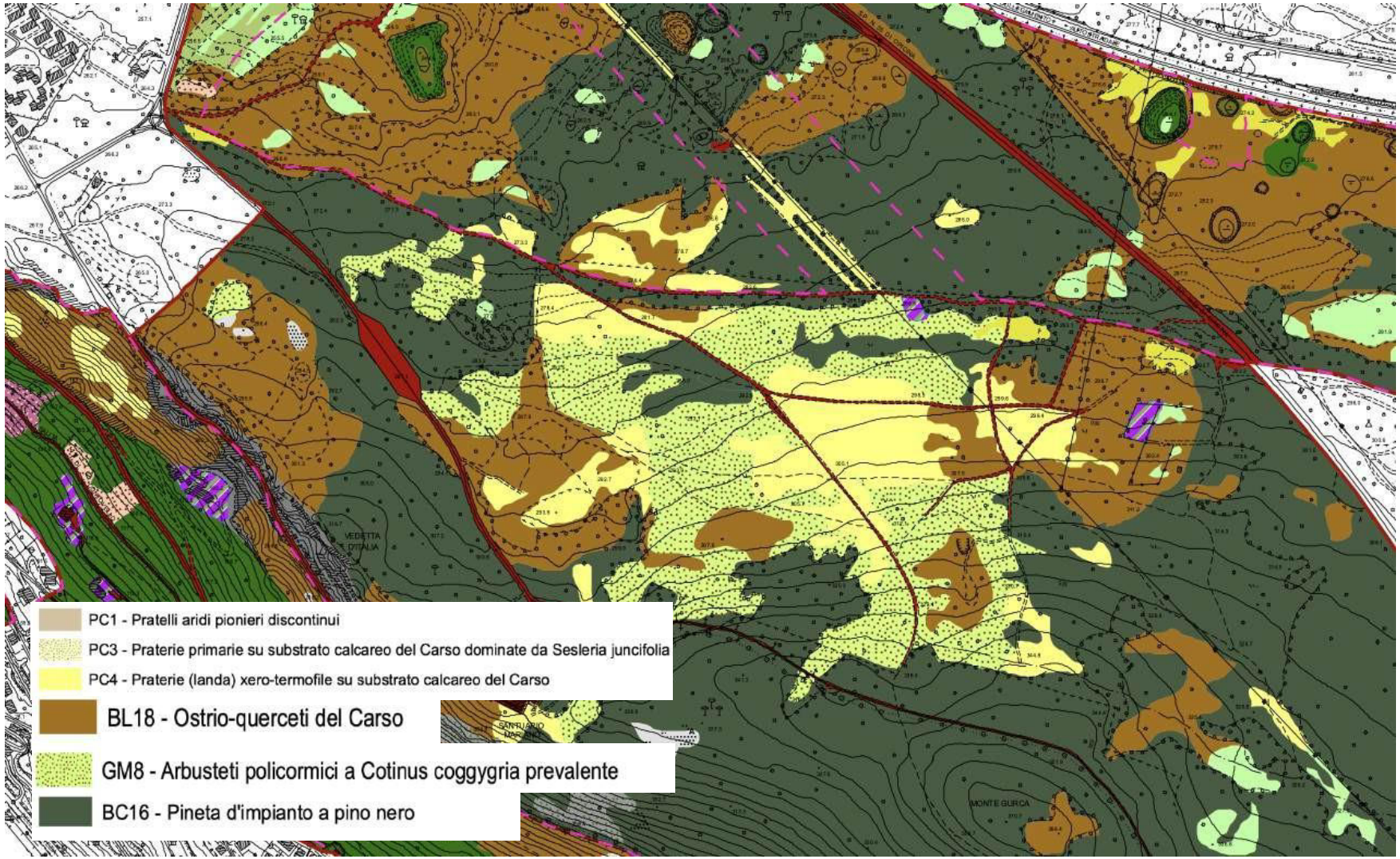
THE KARSIC LANDA

Climate change effects: monitoring the autumn flowering species, the effects of global warming seems to influence the period of blooming of same species, that are postponed; it will be check this point also in the late winter and early spring period.

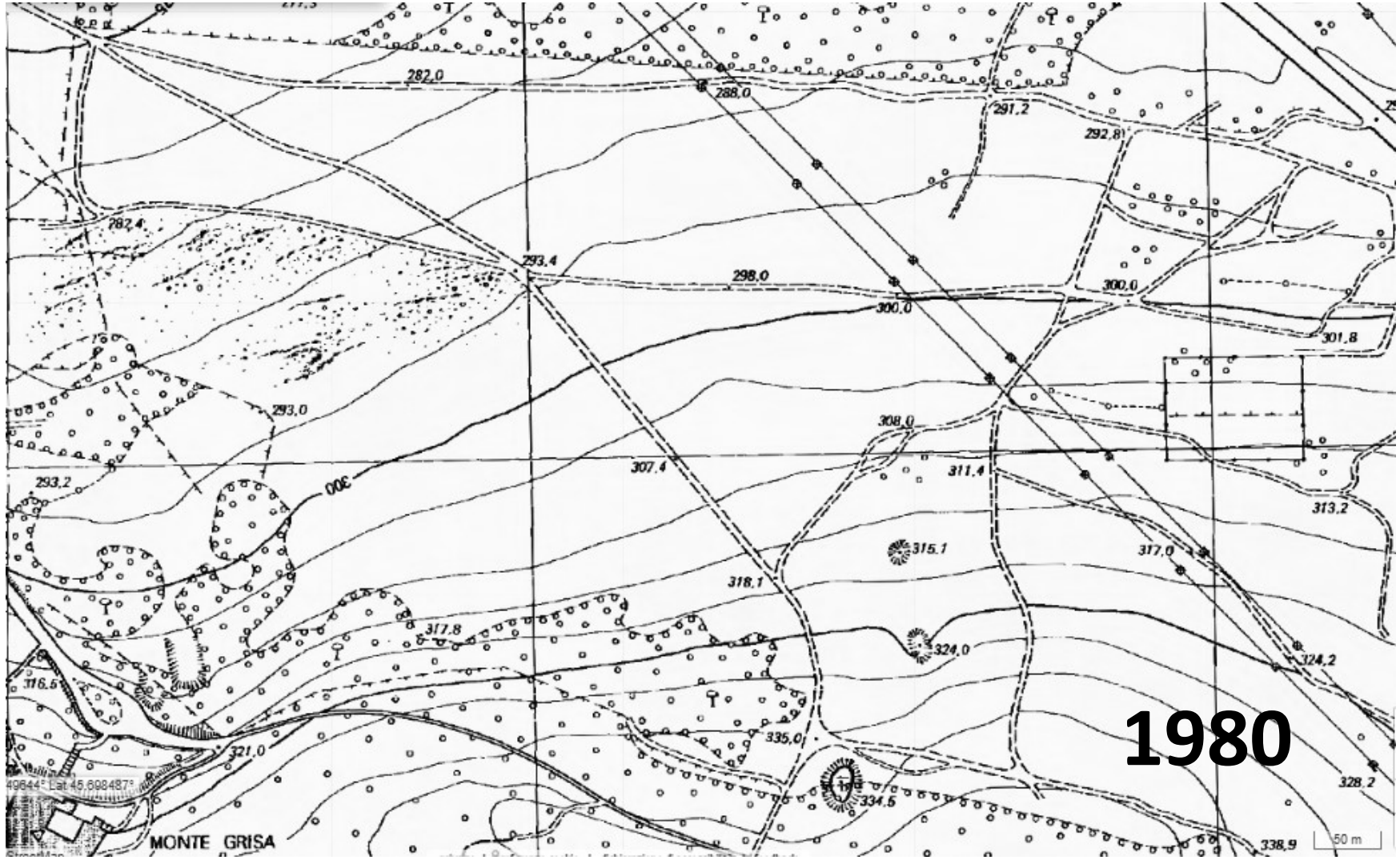


- Arbusteto
- Bosco e boscaglia a latifoglie decidue
- Landa incespugliamento 1
- Landa incespugliamento 2
- Landa non incespugliata
- Mosaico landa-boscaglia
- Pineta a pino nero
- Prato da sfalcio
- Prato pascolo

Ecomosaico del Carso – Kraški ekomozaik



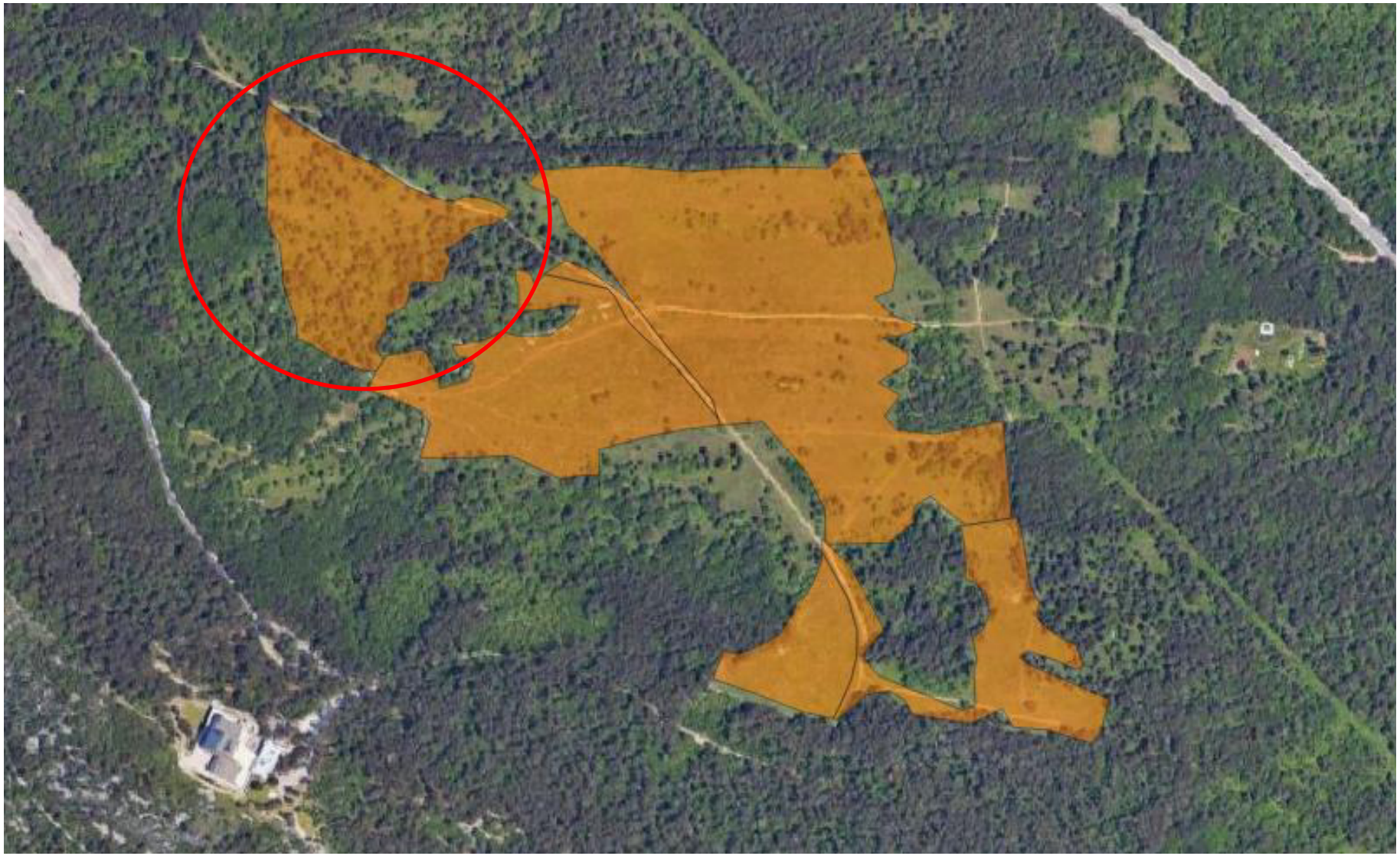
Vegetation technical map

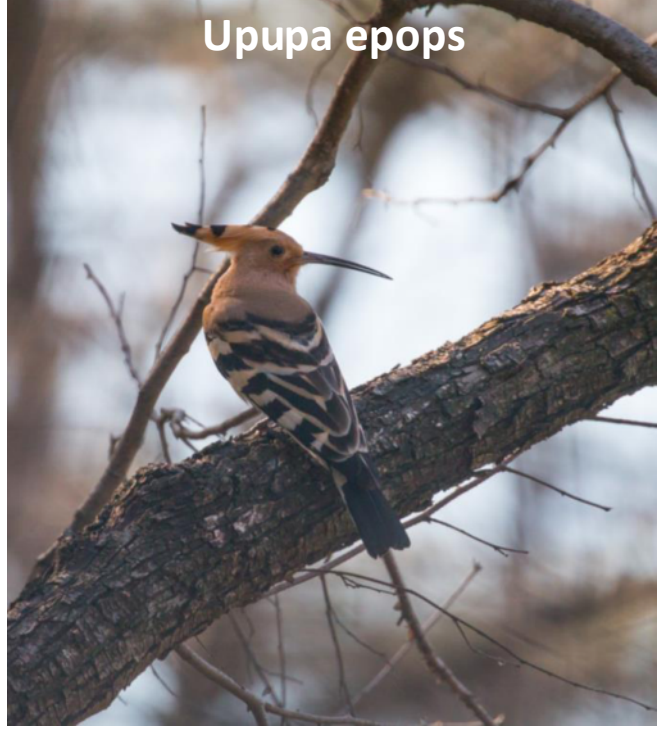


CTR - Regional technical map - Eagle FVG

ORTHOPHOTOS FROM 1998 TO 2020

Eagle FVG




Upupa epops


Circaetus gallicus


Anthus campestris


Mantis religiosa


Amethyst eryngo


Cotinus coggygria

Pilot action for the enhancement of the karst dry grassland

I Seeds collection
Sum/wint 24

Trees cuttings
Summer 25

Bushes cutting
Summer 25

Sow in nursery
March 25

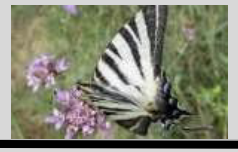
II Seeds collection
At end spring 25

Preparation
experimental
plot

Transplanting
nursery-grown
species

Assessment of
replant vitality
March 26

Periodic monitoring
activities and
citizen science events



Periodic monitoring
activities and
citizen science events

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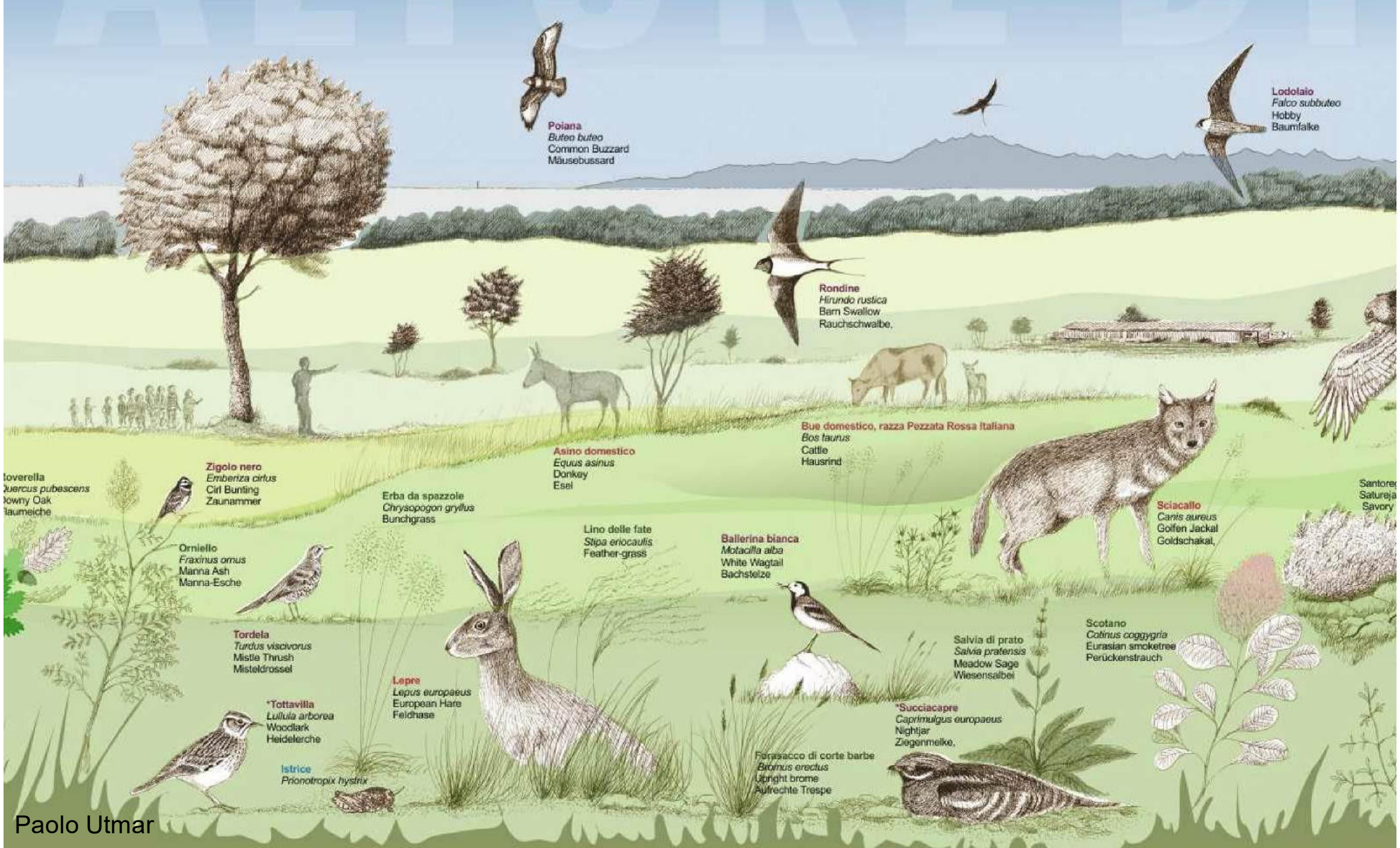
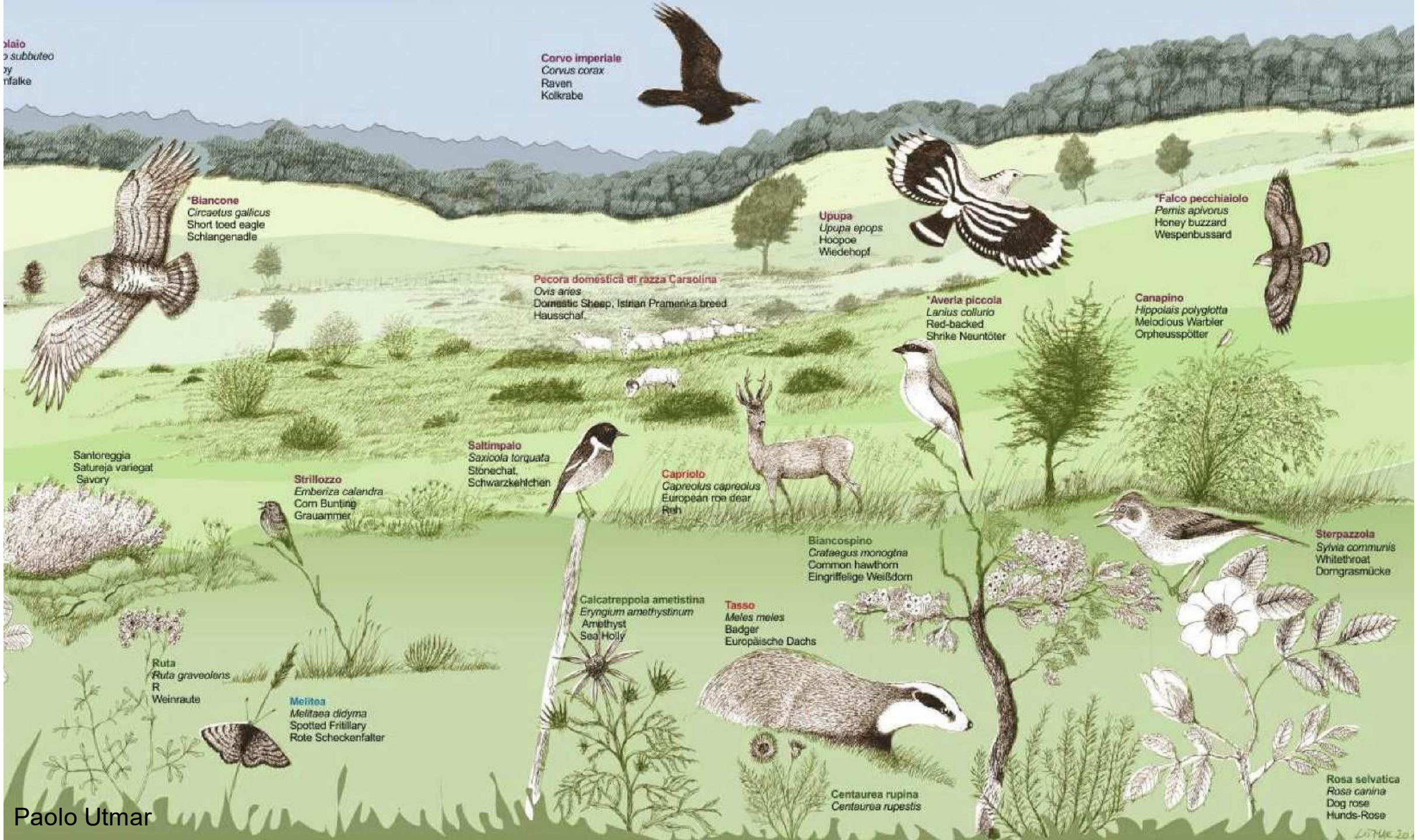

Poiana
Buteo buteo
Common Buzzard
Mäusebussard
Lodolaio
Falco subbuteo
Hobby
Baumfalke
Rondine
Hirundo rustica
Barn Swallow
Rauchschwalbe
Asino domestico
Equus asinus
Donkey
Esel
Bue domestico, razza Pezzata Rossa Italiana
Bos taurus
Cattle
Hausrind
Zigolo nero
Emberiza cirlus
Cirl Bunting
Zaunammer
Erba da spazzole
Chrysopogon gryllus
Bunchgrass
Lino delle fate
Stipa eriocaulis
Feather-grass
Ballerina bianca
Motacilla alba
White Wagtail
Bachstelze
Sciacallo
Canis aureus
Golfen Jackal
Goldschakal
Orniello
Fraxinus ornus
Manna Ash
Manna-Esche
Tordela
Turdus viscivorus
Mistle Thrush
Misteldrossel
Lepre
Lepus europaeus
European Hare
Feldhase
*Tottavilla
Lullula arborea
Woodlark
Heidelerche
Istrice
Prionotropix hystrix
Salvia di prato
Salvia pratensis
Meadow Sage
Wiesensalbei
Scotano
Cotinus coggygria
Eurasian smoketree
Perückenstrauch
*Succiacapre
Caprimulgus europaeus
Nightjar
Ziegenmelke
Forasacco di corte barbe
Bromus erectus
Upright brome
Aufrechte Trespe

Paolo Utmar


Corvo imperiale
Corvus corax
Raven
Kolkrabe
*Biancone
Circaetus gallicus
Short toed eagle
Schlangenadle
Upupa
Upupa epops
Hoopoe
Wiedehopf
*Falco pecchiaiolo
Pernis apivorus
Honey buzzard
Wespenbussard
Pecora domestica di razza Carsolina
Ovis aries
Domestic Sheep, Istrian Pramenka breed
Hausschaf
*Averla piccola
Lanius collurio
Red-backed
Shrike Neuntöter
Canapino
Hippolais polyglotta
Melodious Warbler
Orpheusspötter
Santoreggia
Satureja variegat
Savory
Saltimpalo
Saxicola torquata
Stonechat,
Schwarzkehlchen
Strillozzo
Emberiza calandra
Corn Bunting
Grauammer
Capriolo
Capreolus capreolus
European roe dear
Reh
Biancospino
Crataegus monogina
Common hawthorn
Eingriffelige Weißdorn
Sterpazzola
Sylvia communis
Whitethroat
Dorngrasmücke
Calcatreppola ametistina
Eryngium amethystinum
Amethyst
Sea Holly
Tasso
Meles meles
Badger
Europäische Dachs
Ruta
Ruta graveolens
R
Weinraute
Melitea
Melitaea didyma
Spotted Fritillary
Rote Scheckenfalter
Centaurea rupina
Centaurea rupestis
Rosa selvatica
Rosa canina
Dog rose
Hunds-Rose

Paolo Utmar

Monitoring of the Karst dry grassland at the Monte Grisa site

Vegetation monitoring on treated and natural areas

Methodology of vegetation monitoring and control

1. Mapping with drone to characterize all the study area
2. Monthly observations to describe the flowering of Karst dry grassland species over time and measure their abundance and species richness
3. Creation of a digital atlas of the most common species, to be used in citizen science activities

Monitoring of the Karst dry grassland at the Monte Grisa site

Vegetation monitoring on treated and natural areas

- Vegetation monitoring and control
- Methodology of animal monitoring and control

1. Natural areas no longer used for grazing of sheep, goats, and cattle, for 50 years (since 1979)
2. Periodically mown areas
3. Cleared areas with controlled cutting of the karst shrubland in 2022 and 2025
4. Experimental plots with transplanting nursery-grown species
5. Smoke tree areas with periodic clearing in 2025
6. Forest edges with karst shrubland and black pine forest

Monitoring of the Karst dry grassland at the Monte Grisa site

Butterflies, carabids and birds monitoring

Methodology of animal monitoring and control

1
Monthly field butterfly observations along prefixed transects that pass through all experimental areas and habitats, also using the EBM scheme. Verifying of the butterfly-flower host plant pairing

2
Direct observation resident, migratory, and nesting birds along predetermined transects that pass through all experimental areas and habitat

3
Atlas of Karst dry grassland butterflies and birds

Monitoring of the Karst dry grassland at the Monte Grisa site

DISSEMINATION ACTIVITIES

- General target
- Students
- Stakeholders

THANK YOU!