



A semi-natural pasture used for sheep-farming.



Now abandoned buildings, formerly used by shepherds practicing transhumance.



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Alta Murgia

ITALY

Dry grasslands and scrubland on calcareous substrates are typical habitats of the Alta Murgia National Park in Italy. The long history of agriculture in this region has created a highly biodiverse rural landscape, where natural areas hosting a number of endemic and threatened species can be found alongside semi-natural pastures for sheep and farmland for cereal crops.

In recent times, Alta Murgia has seen increasing levels of habitat fragmentation and contamination, due to a number of human pressures, including land use change and illegal toxic waste dumping, which contaminates soils and aquifers. The most damaging change is the transformation of natural and semi-natural grasslands into areas for cereal crops through stone and rock graining. Graining is a process where rocks are crushed and mixed with soil to create a substrate more suitable for crops. However, graining increases soil run off during heavy rains, especially in steep areas. Graining also scars the landscape due to the removal of traditional structures such as dry stone walls, roads, rural tracks, wells and water stone tanks.

Graining and other pressures have resulted in a change in the delicate balance of natural habitat, crop and livestock production cycles. The continued provision of crop and dairy products has been compromised, and the entire grassland ecosystem has collapsed due to habitat fragmentation and biodiversity loss.

In Alta Murgia, ECO-POTENTIAL is developing an automatic monitoring system which is able to quantify land cover and land use changes from satellite images taken over time. This system will be used to develop scenarios to model land use change, and to support the management authorities to comply to the EU Habitats Directive.



A Sentinel-2 satellite image (10 meters) of Alta Murgia acquired on 23 August 2015 showing bands 4-8-2 in RGB false color composition. The site holds a National Park (EUAP0852) and belongs to the Natura 2000 network (SCI IT9120007).

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A close up of part of Alta Murgia. Rocky natural-grassland patches, in light green, are fragmented by cultivated areas appearing in brown and white colors after ploughing. Bright cultivated patches are fields where farmers grained rocks and stones that belonged to semi-natural grasslands in the past, in order to increase cultivated areas and cereal production. Woodlands appear in dark green.

WorldView-2 satellite image at 2 meters resolution, acquired on 5 October 2011, showing bands 5-7-2 in RGB false color composition. © CNR for ECO-POTENTIAL

Rocks are extracted and removed from the soil before the final graining procedure.



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Arable land created through the process of soil graining. Most of this arable land is used for cereal crops.



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A hilly landscape in Alta Murgia, with the remains of the Garagnone Castle, made by stone from the area. The castle played an important role in the territory for the monitoring of cereal production and its marketing during the Norman reign of the Altavilla. It was destroyed in the earthquake of 1731.