

EGU23-12372, updated on 24 Mar 2024
<https://doi.org/10.5194/egusphere-egu23-12372>
EGU General Assembly 2023
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Dry grassland restoration in Mediterranean degraded lands: the NewLife4Drylands pilot case in Alta Murgia

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The need of adopting practices to restore degraded land has been stressed by the new Soil Strategy, with regard to dry ecosystems showing greater risk of desertification. To assess the effectiveness, feasibility and replicability of restoration techniques applied to Mediterranean dry ecosystems, a set of different restoration techniques has been tested in Alta Murgia National Park (Southern Italy), one of the NewLife4Drylands project (NL4D; <https://www.newlife4drylands.eu>) pilot sites. This area is particularly subjected to land degradation processes as a result of recent and widespread activities of rock shattering for the conversion of calcareous pastures to croplands, which had caused an extensive loss of semi-natural vegetation and ecosystem functions. Experimental efforts were aimed at testing sustainable techniques for the restoration of protected dry grassland types that naturally occur in the study area. Within an overall surface of 9000 m², 42 experimental plots of 20x10m areas (14 treatments with 3 replicates) were selected in either recently ploughed or unploughed surfaces. For each soil type, a set of restoration techniques was tested, including different combinations of soil processing (i.e. harrowing, topsoil inversion, sod cutting, soil compression), transfer of plant material (i.e. dry hay, seed-enriched hay, shrub seeds) and soil cover (jute bionet). Unmanaged surfaces were selected as control plots for each soil type. Restoration effects, in terms of changes in plant community and soil features, will be monitored in comparison with initial conditions. The experimented approaches, along with the assessment of its effectiveness and feasibility, will provide useful information to guide the users to the identification of the most suitable nature-based solutions for the restoration of degraded lands. Within the aims of the NL4D project, the results of this experiment will be used to validate protocols and monitoring tools for environmental management and planning at local and regional scale based on the use of remote sensing techniques.