Ephemeral freshwater wetlands in the Maltese Islands: effects of anthropogenic stress and protective counter-measures

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Freshwater habitats in the Maltese Islands are not of widespread occurrence. The extent of such biotopes is limited by the spatial properties of the islands and by temporal restrictions resulting from biseasonal precipitation patterns. As such, natural freshwaters in the Maltese Islands are strictly ephemeral and generally occur as temporary pools maintained by cycles of precipitation and as intermittent streams that accumulate surface runoff in valley systems.

Such wetlands are consequently colonised by a depauperate assemblage of resident species that are resistant to periods of desiccation. Biotic impoverishment resulting from climatic stress is further amplified by considerable anthropogenic influences arising from the high density of the human population of the Maltese Islands (>1095 km^{-2}). Much anthropogenic interference originates from demand for land in order to accommodate agricultural, residential, industrial and communicative requirements. This has resulted in the obliteration, fragmentation and simplification of extensive tracts of countryside with consequent loss or severe degradation of ephemeral wetlands and their associated resident species. The principal long-term threats to such species arise from range fragmentation and increased habitat insularity, both of which contribute to higher incidences of local population extinctions. Pools that form in the beds of intermittent streams are also subject to leaching of biocides and fertiliser from agricultural land resulting in additional stress on colonisers. In consequence, several species that are typical of temporary waters are of extremely limited occurrence and in many cases are restricted to records from a single habitat.

There is currently no explicit legislation concerning the conservation of ephemeral wetlands in the Maltese Islands. Implicit protection has however been provided through the introduction of stringent legal procedures regarding environmental management in relation to proposed development. Within this context, such wetlands and wetland biota are utilised as biophysical indicators of the ecological significance and scientific importance of a site in the formulation of environmental planning statements.

Although many of these habitats are degraded, little ecological restoration has been practised. Much of these restorative procedures have been carried out on private initiative and are consequently limited in scope and frequently misguided. Systematic restoration of wetlands has taken place at one major site (Ghadira marsh) and is currently in progress at a number of smaller sites all of which are either protected areas or candidate nature reserves.