# Future Predictions of *Cyclamen* Distribution in the Mediterranean Region

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*Cyclamen graecum*
Photo: Martyn Denney

## Background

The IUCN red list process is an important tool to report threatened species to relevant organizations and to support national and regional legislation to implement conservation measures in law. The IUCN red list requirements qualify species as critically endangered when considered to be facing an extremely high risk of extinction in the wild measured by an observed or estimated reduction of population size of more than 80% due to a decline in the area of occupancy, extent of occurrence and/or quality of habitat. Despite the whole genus being on CITES II, no species are yet red-listed.

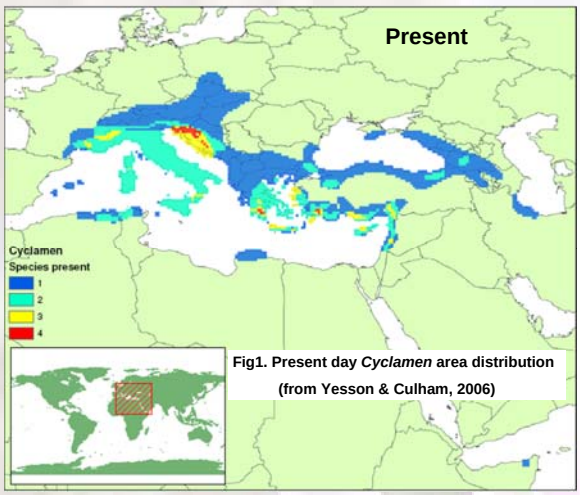


**Fig1. Present day *Cyclamen* area distribution (from Yesson & Culham, 2006)**

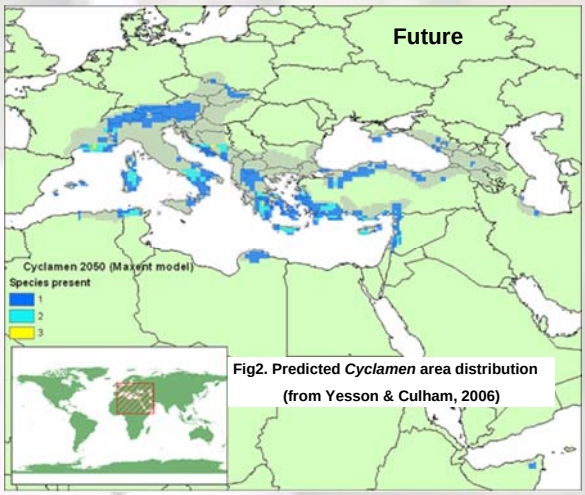


**Fig2. Predicted *Cyclamen* area distribution (from Yesson & Culham, 2006)**

*Cyclamen* (Myrsinaceae) occupy the Mediterranean region, with highest diversity in Greece and Turkey, with a few species endemic to islands. *Cyclamen* species have a phenological preference for dry summers and wet winters. A recent study developed models of the climatic niches of *Cyclamen*. These models were projected into future climate scenarios for 2050. The area of climatic suitability for every *Cyclamen* species is predicted to decrease. A limited dispersal capacity places them at high risk of extinction. Half of the species are threat ened with extinction due to their potential area loss, indicating that conservation and protection for these species has to be implemented by adding them to the red list.

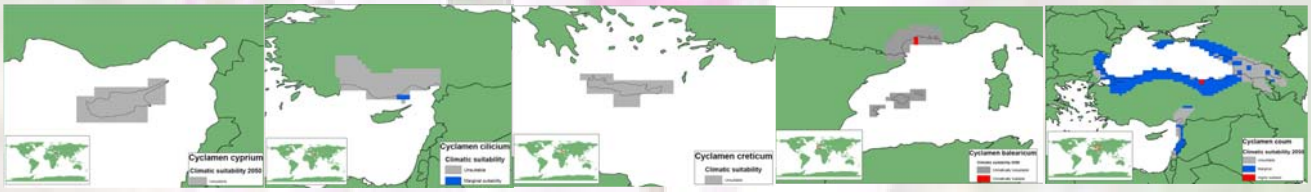


**Fig. 3 Areas of loss suitability of critically endangered species**

*Cyclamen hederifolium*
Photo: Alastair Culham

## Results

We believe that there is a phylogenetic pattern between species distribution, speciation and the predicted area loss. Corresponding to the predicted area loss, the following IUCN categories are proposed as it follows:

**CR** (critically endangered) area loss ≥ 80%, for *C.colchicum, C.intaminatum, C.libanoticum, C.creticum, C.cyprium, C.elegans, C.mirabile,C.parviflorum, C.rohlfsianum, C.somalense, C.cilicium*, *C.trochopteranthum, C.africanum*, *C.balearicum, C.pseudoibericum and C.coum.*

**EN** (endangered) area loss ≥ *50% for C.hederifolium, C.graecum and C persicum*

**VU** (vulnerable) area loss ≥ 30% *for C. purpurascens and C.repandum.*

**LC** (least concern) is none of the species. This critically endangered species have some trading protection from CITES, but are not listed and due to the new peril of climate change, their protection status should be included under the IUCN red list.

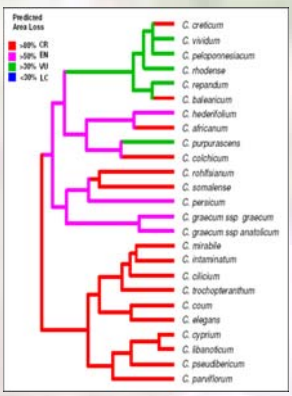


**Fig. 4 Phylogenetic pattern of *Cyclamen* area loss**

## Conclusions

Correlating the phylogenetic pattern and the area loss perspective with the potential extinction risk, we can predict that major lineages could survive, but the16 **CR** proposed species are going to become extinct in the wild, and the **EN** will become critically endangered without human intervention. We recommend these species to be added to the IUCN red list under the threatened categories.

## References

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