



Rapid response to conservation scrapes by *Ditrichum cornubicum*

The globally rare *Ditrichum cornubicum* has been undergoing a long-term decline as open patches of metalliferous ground are gradually lost to vegetation succession on abandoned mine sites. Turf-stripping of scrapes at Phoenix United Mine using an excavator in September 2015 resulted in a twenty-fold increase in the site's population by the third winter (Callaghan, 2018). This was followed by a rapid decline due to competitive exclusion by other colonists, especially *Ceratodon purpureus*, and perhaps also changes in chemistry at the spoil surface (Callaghan, 2021). In June 2021, seven further scrapes were excavated at this site, some overlapping with previous scrapes and others exposing new areas of old spoil. In a survey in November 2021 I found *D. cornubicum* in four of the new scrapes, with a total of 22 occupied 10 cm grid cells. The colonies had clearly arisen from a soil diaspore bank, which must be comprised of rhizoidal tubers and perhaps plant fragments since the species does not produce sporophytes, with only males known. Inspection of some of the new colonies revealed abundant new tubers, showing that the moss can complete its full life-cycle, from tuber to tuber, within five months, which included a summer and autumn period. The longevity of the tubers is impossible to



△ *Ditrichum cornubicum* in a conservation scrape. Des Callaghan.

◁ Locations (red dots) of *Ditrichum cornubicum* in November 2021 in a conservation scrape that was excavated in June 2021. Des Callaghan

judge accurately from the information available, but at least some of the present colonies have likely arisen from some that are several decades old, because prior to the current excavations a dense grassland turf was continuously present over them since at least the 1990s, perhaps much longer. The results help to confirm that the type of management undertaken can be successful and, if repeated sufficiently often, has the potential to ensure the future survival of *D. cornubicum*.

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References

- Callaghan, D.A. (2018).** Status, conservation and ecology of the exceptionally rare metallophyte Cornish Path-moss (*Ditrichum cornubicum* Paton). *Journal of Bryology* 40: 358–370.
- Callaghan, D.A. (2021).** Survival of the critically endangered *Ditrichum cornubicum* and dependence on conservation management intervention. *Journal of Bryology* 43: 175–180.

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