

Alpine cotula eradication project

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Admittedly rather later than I had hoped for after starting this project (owing to pressure of other work), I paid a visit to north-west Coigach from late on 22nd to mid-afternoon on 23rd May.

On 22nd May I met with Ian MacLeod (Grazings Clerk and principal grazier of the Old Dornie and Polbain area) and had a useful initial discussion with him about the plant. I was sorry not to be able also to meet Mr & Mrs Rex (owners of Badentarbat Estate), though I have been in correspondence with them. I then paid a brief visit to the viewpoint north of Altandhu (NB984132), sufficient to ascertain that the cotula is well established in the closely cropped rough grazing there. I stayed at Peter and Midge Blake's b&b.

On 23rd May I began the detailed field-survey stage of the project, starting at the eastern limit of the plant's range in its Polbain stronghold, at Badentarbat beach. There it occurs in scattered groups in the closely cropped turf, reaching furthest east on the south side of the road at NC0114109665:



The trowel (here and in other photographs) marks where the plant can be found

This is about 50m further along the beach than I remember locating its 'leading edge' on my first visit here in May 2010, shortly after the plant had first been reported to me; regular monitoring from now on should give a good idea of its potential rate of spread. It also occurs on the north side of the road but only in a few clumps, the easternmost currently being at NC01080969:



Westwards from here, it is chiefly a plant of the closely cropped common grazings, on roadside verges (right through Polbain village) and in coastal grassland (around Dornie bay). It shows distinct preference for drier, grassy areas, usually on sloping ground, particularly if south-facing: this is presumably where it stands the lowest threat of competition from potentially overtopping grasses.



Cotula grows on the grassy, green roadside bank but peters out in the damper, lower ground ...



... However, if the conditions are right, as here, it can be found as far as 10m from the verge



Here it shows, as bright green, near the rocks, on strongly sloping ground



Here, it exploits the dry, raised ground at the base of this hydrant post

It varies in density from singleton to extensive, even dominant, clumps that tend to exclude other plants:



Although predominantly on drier ground, I have found two exceptions so far, which I illustrate below:



In flush on coastal path at NB988101



In flush below cairn, at NB983102

It is bad news that closer inspection shows alpine cotula to be rhizomatous, with creeping underground stems periodically breaking surface to throw up a new rosette. This can be clearly seen in the following photograph of ± linear growth down a steep bank, with rhizomes exposed by soil erosion near the top:



This helps explain the plant's successful colonization: seedling establishment can be followed by gradual vegetative spread to form sizeable mats. It also suggests that, while digging up might work for young seedlings, it would prove impossible for more established plants – not least because the rhizomes break easily; also that chemical control would probably need to involve translocated herbicides, because contact ones would almost certainly leave rhizomes alive and capable of regrowth.

Better news is that fencing, and hence the management regime, seems to have a significant effect: hardly any cases were found where even vigorous colonies had crossed boundaries except by minimal rhizome development:



for example, here at Lower Polbain, the roadside bank on the right of the fence has significant cotula established but hardly any has migrated left of the fence (apart from along the line of the far driveway). It would be nice to try to understand better these grazing/management regimes' impact on cotula.

Ian MacLeod is understandably concerned whether we can work out how the plant spreads. We shall never know for certain how it arrived at Polbain – or even when – but my guess remains that it came as seed, probably in wool shoddy (or in jute bags which had contained this) imported from Australia, and that it has probably been established, and spreading, for at least thirty years. Having now studied it more closely, I am convinced that seed – inadvertently carried on vehicle tyres, human footwear or the feet of livestock – has been the main vector for establishing the plant at new sites. What are clearly new seedlings can be found at the 'leading edge' of colonies; and on the larger scale how else can we explain new colonies formed at disjunct sites far removed from the core, with unsuitable ground for colonization in between: for example, its occurrence on the headland Rubha a' Mhadaidh-Ruaidh (in the distance in the above photo) but in the only grassy area around the ruined sheiling at NB982099; and at the roadside at Bad a' Ghail (where it now occurs along 160m of verge at NC06971142 to NC06821139)?

I suspect that wind-blown seeding over a relatively short distance from the mother plant could allow fairly rapid spread within what seems to be suitable habitat (for example along Badentarbat beach, where the individual colonies seem to be too well trodden to be achieving much rhizomatous spread) – but I should like to study this more in the late summer. I am impressed though (and heartened!) by the apparent failure of wind-blown seeds to invade contiguous areas, such as the croft-land south of Polbain village: this gives hope that the problem can be at least contained and over time potentially controlled where it currently grows within narrow, common grazings' corridors.

The plant's rhizomatous habit clearly allows successfully established seedlings to form progressive mats which, by their very nature, are likely over time to become separated from their 'mother plant' – which might go some way to explaining the invader's current patchy distribution. This creeping habit does, though, present a serious problem in controlling it when it has spread amongst other vegetation.

Research will be needed to see if the plant has already developed an active seed-bank, but otherwise my preliminary hypothesis is that control might best be achieved by a combination of a) grazing exclosures, allowing the grasses to overtop and shade out the cotula; and b) application of hormone-type herbicide – translocated and selective (*i.e.* attacking broad-leaved plants but leaving grasses unharmed).

A good site to test the former might be at the east end of Dornie bay, where there is a stretch of coastal grassland with cotula dominant but which looks as if it could be fenced off relatively easily [though we don't know yet for how long would this be needed]. If that was successful, it would be worth considering how to extend that strategy where it can only present much more of a problem, for example along the roadside through Polbain (with its need to allow continued access for traffic, humans and livestock).

The other alternative is herbicide application. I have so far only recorded in detail the ground south from Polbain, between Badentarbat beach in the east to Mol Mor in the west, so there is still significant work to do to record the plant's distribution (and any associated rarities or similar hazards) north of Polbain, in Old Dornie and Altandhu, and to see if the cotula has spread east in the common grazing towards Meall na Beiste or Meall an Fheadain*¹. However, from what I have seen so far, my preference would be to explore setting up trial plots at two sites already mentioned, Altandhu viewpoint and Bad a' Ghail roadside: the former both because, as a tourist stop, it is likely to act as a potential source for seed spread, and also tackling the problem there would involve, at a small scale, issues of people-management which would be needed if control measures were later undertaken at the larger scale; and the latter both because it is the nearest source of infection to the 'exit' from Coigach, but sufficiently discrete for the efficacy of any experimentation to be obvious.

Herbicide use has the disadvantage that, applied too widely, it could cause damage to other plants (*e.g.* buckshorn plantain [*Plantago coronopus*], which to an untrained eye might look similar to the cotula; or to local rarities such as moonwort [*Botrychium lunaria*] or heath cudweed [*Gnaphalium sylvaticum*]).



buckshorn plantain



moonwort



heath cudweed

Such is the current level of invasion by cotula that heavy-handed use of herbicide could also result in unsightly patches of vegetational dieback – not good in an area which, rightly, puts a high value on its environmental appeal to tourists (see front cover). One answer to this, since cotula is winter-green, would be to test herbicide application in winter, when any collateral damage should be minimised and also less visible.

I shall be circulating this draft report to a number of key individuals, and should be glad of any feedback. This project will only succeed if it continues to attract widespread support from its stakeholders.

¹ to which end I hope to organize a field meeting later this summer