

Translocating Isle of Man cabbage *Coincya monensis* ssp. *monensis* in the sand-dunes of the Sefton coast, Merseyside, UK

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SUMMARY

This paper describes the results of a translocation rescue of the British endemic Isle of Man cabbage *Coincya monensis* ssp. *monensis* from a sand-dune ridge at Crosby, Merseyside, which was about to be excavated as a source of sand for a coastal protection scheme at nearby Hightown. Using methods developed during a 1992 translocation, over eight hundred 1st year plants, together with seed-pods, were moved by volunteers to two protected receptor sites at Crosby and Birkdale in August 2011. Monitoring the following summer located small surviving populations at the receptor sites but mortality of transplants appeared to be over 90%, seed germination and establishment contributing most individuals. Low success at Crosby seemed partly attributable to winter sand-blow and heavy public pressure, while vegetation overgrowth may have been an adverse factor at Birkdale. An unexpected finding was that the original Crosby colony survived the removal of most of its habitat, about 1300 plants being counted in 2012 on the levelled dune area. More than half were small seedlings, presumably derived from buried seed. Also, 234 Isle of Man cabbage plants were discovered on the new coastal defence bund at Hightown, having arisen from propagules transported from Crosby. Other known Sefton duneland colonies at Southport Marine Lake and Blundellsands were also monitored, the former having apparently declined to extinction.

BACKGROUND

Isle of Man cabbage is a British endemic, confined to Irish Sea coasts between Ayrshire and Wirral with an outlier in South Wales. This species is a short-lived perennial, its habitat being thinly vegetated sandy soils near the coast with bare patches for colonisation by seed; this being essential to maintain populations. It is particularly associated with UK National Vegetation Classification communities SD6: *Ammophila arenaria* mobile dune and SD7: *Ammophila arenaria*-*Festuca rubra* semi-fixed dune, being unable to compete successfully in late successional grassland (Hipkin & Facey 2009; Rodwell 2000).

Isle of Man cabbage has always been highly localised in Sefton, Merseyside, and is the subject of a Species Action Plan in the North Merseyside Biodiversity Action Plan (Merseyside Biodiversity Group 2001). Although the Vascular Plant Red Data List for

Great Britain records its threat status as “Least Concern” (i.e. not at high risk), it acknowledges an international responsibility to conserve the plant (Cheffings & Farrell 2005).

By 2010, Isle of Man cabbage was restricted to three Sefton duneland sites at Crosby Marine Park (Fig. 1), Blundellsands, and Southport Marine Lake, a survey in that year recording 648, 514 and nine plants respectively. The Crosby and Blundellsands colonies originated from an emergency translocation in July 1992, just before a relict population on a roadside verge at Blundellsands was destroyed by development. They have been monitored regularly and were thought to be amongst the largest populations in Britain (and therefore in the world) (Smith 2007, 2010; Smith & Lockwood 2010a).

Having obtained planning permission, the land-owner, Sefton Metropolitan Borough Council, removed 30,000 tonnes of sand in autumn 2011 from a dune ridge at Crosby Marine Park to use



Fig. 1. Crosby Marine Park dune ridge before removal, showing Isle of Man cabbage



Fig. 2. Sand-removal, Isle of Man cabbage colony, Crosby, September 2011



Fig. 3. Volunteers transplanting Isle of Man cabbage, Crosby, August 2011



Fig. 4. Receptor site at Birkdale dunes, August 2011

for beach replenishment at Hightown, about 5 km to the north, as part of a coast protection scheme. The area extracted included the whole of the Crosby site occupied by Isle of Man cabbage (Fig. 2). Although lying just outside the Sefton Coast Site of Special Scientific Interest, the ridge formed part of a Site of Local Biological Interest designated by the Council. As a contribution to ecological mitigation for this development, it was agreed that the Wildlife Trust for Lancashire, Greater Manchester and North Merseyside would organise a translocation rescue of the plants at Crosby Marine Park to suitable sites elsewhere on the coastal dunes.

Following the methodology adopted in 1992 (Rooney 1992), two apparently suitable receptor sites were chosen as follows:

- Crosby frontal dunes. A 140 m-long central section of a young dune ridge on the foreshore at Crosby (National Grid Reference SJ3101398218 to SJ3094798360) has recently become semi-fixed on its crest and back-slope, though it still retains an open plant community with plenty of bare sand. This locality is only about 100 m from the

existing Isle of Man cabbage colony at Crosby Marine Park and is protected by Site of Special Scientific Interest and European *Natura 2000* designations.

- Birkdale frontal dunes. About 18 km north of Crosby, this site extends for about 65 m along the back-slope of a high dune ridge (SD3193416238 to SD3187616212), also within the Sefton Coast designated sites. The habitat is marram *Ammophila arenaria*-dominated semi-fixed dune with many bare patches and informal sandy footpaths maintained by light recreational trampling. Use of this site can be justified as it is a re-introduction to a former site, a small population of Isle of Man cabbage having occurred about 100 m to the south-east during the 1980s. However, this colony became extinct in the early 1990s due to scrub invasion (Smith 2010).

ACTION

The translocation took place on 24 and 25 August 2011 (Fig. 3, 4). Two groups of volunteers (10 on the first day and 15 on the



Fig. 5. Levelled dune ridge at Crosby in June 2012 showing recovery of vegetation, including Isle of Man cabbage

second) were assisted by Sefton Coast & Countryside Department staff with a water-tanker towed behind a Landrover. Having first obtained permission from the land-owner, first-year rosettes of Isle of Man cabbage were carefully dug up with as much as possible of the tap-root intact, transferred into plastic containers, kept moist in damp sand or wet towels, and transported to the receptor sites. In addition, seed-heads from mature plants were harvested using secateurs. The young plants were planted out in bare sand at least 30 cm apart and thoroughly watered. Seed-pods were broadcast at the two receptor sites.

On the first day, 429 plants were transferred to the Crosby site. The following day, an additional 78 plants were moved to Crosby and 322 were planted out at Birkdale, making a total of 829 transplants (Table 1). The weather was showery, which probably helped assist establishment.

The following summer, both receptor sites were checked for surviving transplants, flowering and non-flowering rosettes being counted separately. Both the area at Crosby, from which sand had been removed, and the tipped sand bunds at Hightown were examined to see if any Isle of Man cabbage plants had survived. Additionally, the two other known colonies at Blundellsands and Southport were monitored.

CONSEQUENCES

Crosby: On 12 June 2012, the receptor site at the Crosby frontal dune ridge was searched. Surviving transplants were recorded between SJ3096498338 and SJ3099798247; 16 flowering and 23 non-flowering rosettes (total 39) being counted, compared with the 507

originally transplanted. This represents a survival rate of only 8%. However, some of the smaller non-flowering plants may have arisen from broadcast seed rather than transplants, so mortality could have been higher than 92% (Table 1). High mortality was expected, as the 1992 translocation had resulted in only 8% survival after two years (Smith 2007, 2010).

It was noted that the area of semi-fixed dune chosen for the transplants had been severely affected by sand-blow caused by the frequency of winter gales and uncontrolled public pressure; the latter seemed to have increased since the previous summer. Much of the vegetation had been overblown by fresh sand or damaged by trampling, thereby reducing the chances of survival for the Isle of Man cabbage transplants. Appropriate management of this dune ridge has been proposed for amenity as well as ecological reasons (Smith & Lockwood 2010b).

Inspection of the site of the original Crosby colony, now a gently shelving expanse of disturbed sandy ground, revealed that a large numbers of Isle of Man cabbage plants had surprisingly survived, despite the almost complete destruction of their original habitat (Fig. 5). On 27 July 2012, 654 flowering and 677 non-flowering rosettes were counted. They were distributed between SJ3094898467 and SJ3101998284, a linear distance of 196 m. This area coincides approximately with the original colony, except that some individuals were found up to 60 m further south than previously, presumably due to movement of propagules by heavy machinery. Many of the non-flowering plants were small and had evidently arisen from seed, perhaps long-buried and exposed by the disturbance. The wet late spring and early summer of 2012 may have assisted germination and establishment of these plants.

Although this site currently supports a relatively open pioneer vegetation ideal for Isle of Man cabbage, its lack of topography may eventually encourage succession to a closed sward, which would not favour the plant (Hipkin & Facey 2009).

Birkdale: At the Birkdale receptor site, we counted 124 Isle of Man cabbage plants between SD3188316219 and SD3193416227 on 15 June 2012. All were non-flowering and 114 were small enough to be first-year rosettes, indicating that they had probably arisen from seed rather than transplantation. The remaining 10 were larger and therefore probably transplants, despite the fact that they did not

support inflorescences. Assuming that only 10 of the plants arose from transplants gives a mortality of about 97% (Table 1).

By contrast with the Crosby site, the Birkdale habitat was relatively undisturbed with bare sand largely confined to occasional tracks used by joggers and dog-walkers. Much overgrowth of tall vegetation, especially marram, had occurred since the previous autumn, perhaps due to the exceptionally wet, early summer of 2012. This may have reduced areas of suitable habitat for the Isle of Man cabbage.

Hightown: On 23 July 2012, we visited Hightown dunes to see whether any Isle of Man cabbage propagules had survived in the sand removed from Crosby, the previous year, and which had been tipped on the beach to create two bunds extending north and south of Hightown Sailing Club. We found large numbers of plants associated with the southern bund. Rosettes were present on the level summit (98 plants), near the foot on the bund on the seaward side (86) and along the eastern fringe (50), where considerable sand-blow inland had occurred. About 22% of the 234 plants counted supported flower-spikes. The majority was considered to be recently established seedlings. Three large flowering specimens were also found on sandy ridges in the restored former works compound about 100 m north-east of the bund. The northern bund and its surroundings were also searched but no Isle of Man cabbage was found.

Although some limited planting of marram had taken place on the top of the bunds, they remained relatively open and sandy with steep west-facing slopes, supporting sparse marram sprouting from rhizome fragments. As at Crosby, establishment Isle of Man cabbage was probably assisted by the unusually wet early summer period and some mortality of the young plants may be anticipated before they are old enough to flower and set seed. Thus, Hipkin & Facey (2009) refer to high seedling mortality during colder winters.

Blundellsands: The Blundellsands dunes were explored on 1 August 2012, a total of 493 rosettes of Isle of Man cabbage (432 flowering, 61 non-flowering) being counted, compared with 514 in 2010. About 0.9 ha of semi-fixed dune habitat was occupied by the target species between the following coordinates: SD2987700827 (north), SD2994000662 (south), SD2987400728 (west) and SD2992700782 (east). Although population size remained virtually unchanged, vegetation overgrowth was more noticeable than previously, many formerly sandy footpaths having become grassed over. Isle of Man cabbage plants were mainly associated with the edges of blow-outs, the margins of paths and the few remaining areas of short, open turf, especially on south or west-facing slopes. A few individuals were also found in dense marram. Some of the plants were particularly large and floriferous, reaching diameters of over a metre.

Southport: We searched the dunes west of Southport Marine Lake on 11 July 2012 but failed to find any Isle of Man cabbage plants. It seems this colony may have become extinct after declining in recent years. Previous counts were 347 in 1989, 874 in 1997, 281 in 2004 and nine in 2010. This decline has been tentatively attributed to increasing stabilisation of these dunes (Smith 2010).

This study reinforces earlier findings that Isle of Man cabbage requires open, mobile-dune conditions and demonstrates a remarkable ability to survive catastrophic disruption of its habitat. Most of the plants found at the receptor sites appeared to be first-year rosettes, so it is concluded that use of seed rather than transplantation may be a more effective method of establishing new populations. Monitoring at one or two year intervals (Smith 2007) will be needed to determine the effectiveness of the translocation project and the viability of new populations at Hightown, Crosby and Birkdale.

Table 1. Isle of Man cabbage receptor site transplant and mortality data

Receptor site	No. of transplants	Total survivors	Flowering	Non-flowering	Approx. mortality
Crosby frontal ridge	507	39	16	23	92%
Birkdale dunes	322	124	0	124	97%
Total	829	163	16	147	

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