

Cumbria Dynamic Dunescapes Project rabbit population enhancement methods



Background

European rabbits (*Oryctolagus cuniculus*) are a keystone species in sand dune systems due to their impact on ecosystem structure as a landscape engineer. Their selective grazing, burrowing, digging for roots and latrine creation creates an open shortly grazed sward with lots of small areas of bare sand which to varying degrees depending on population numbers and in partnership with livestock grazing can halt and even reverse the current decline of dune systems towards overstabilisation and the succession to scrub.

Rabbit grazing and disturbance creates a varied, open mix of different vegetation types which increases species richness and ultimately dune biodiversity. In the past, before the 1950's, dune systems were home to vast numbers of rabbits which had a dramatic effect on dune vegetation, biodiversity, bare sand creation and movement.

Since the 1950's when myxomatosis was introduced, it is estimated that the rabbit population has decreased by up to 99% in some areas. It is only

now being realised what effect, along with other contributory factors, this has had on dune ecosystems. Populations have recovered slightly from initial low numbers with limited immunity, but myxomatosis is still present in the population. During the 1990's a newly introduced rabbit haemorrhagic disease virus RHDV1 first discovered in domestic rabbits and RHDV2 similarly in 2010, have further decimated any recovery in population numbers.

Enhancement methods

Considering how important rabbit populations are to the biodiversity of dune systems and slowing their overstabilisation, it is vital that we do as much as possible to enhance current populations to increase numbers and prevent this keystone species from disappearing from Cumbria sand dune sites.

Initially the project brief was to investigate rabbit reintroduction from sites in Cumbria with a healthy population to dune sites with tiny populations to boost numbers. During the first lockdown research into reintroduction methods and productivity revealed very low success rates due to high losses during transportation due to stress. Rabbits can be inoculated for the main introduced diseases which affect them but would need to be reinoculated after 12 months to maintain immunity. So due to the low success and need for recapture for further inoculation this option was not pursued as a method for enhancing numbers.

Previous rabbit enhancement projects had found brush piles a successful method of creating artificial burrows and shelter from predators which encouraged existing populations to expand their range and graze further away from existing burrows. This was a low cost and effective use for the brash/brush produced from ongoing winter scrub clearance at some of the managed dune sites. Used in conjunction with small areas of stripped turf a pile of branches between 2m–4m square was placed over small bundles of branches to create a safe space below from predators and a start for new burrowing activity. If these are located between 50m-100m of existing burrows it increases their chance of success and habitat expansion. It is hoped that this method could become part of the annual habitat management programme at several sites.



1. New brush pile and small turf stripped area at Sandscale Haws NNR created by NT staff and volunteers, was being used by rabbits straight away.

On several sites in Cumbria working with partners, we have been turf-stripping as part of the project's capital works programme, to create large areas of bare sand which are now missing from many dune sites due to over-stabilisation. The turf stripped areas create habitat for pioneer plant species, many of which are dune specialists, to colonise increasing species-richness. A bonus on these turf-stripped areas was rabbit colonisation, with some sites showing signs of rabbit digging within less than 24hrs.

When the rabbit population crashes and grazing is dramatically reduced a dune site can become over-stabilised with areas of tall rank dominant Marram grass (*Ammophila arenaria*), it will become less diverse in plant species and the sward is less palatable and attractive for rabbits and domestic animals to graze. By turf stripping it immediately gives rabbits bare sand in which to dig and brings Marram grass roots close to the surface and accessible for rabbits to find. It was also found that initial marram grass regrowth after project turf stripping was palatable and being grazed by rabbits and livestock.



2. Turf stripped area showing rabbit digging and droppings within 24 hrs.

Even small areas of turf stripping by hand within 50m-100m of existing burrows, but preferably in partnership with brash piles, would improve habitat expansion. As part of the mechanical turf stripping at several Cumbrian sites we stripped turf from areas of steep dune face to create areas of bare sand that were accessible for rabbit burrowing. Rabbits prefer south facing sites for burrowing which are warmer, so this should be factored into any dune face turf stripping mechanically or by hand tools.

As part of the mechanical turf stripping at several sites, spoil was created from the stripped turf and surface sand. Rather than a costly removal from site much of the spoil was landscaped into hollows or added to nearby dune shoulders to use up close by. Another rabbit friendly use was to create banks of the spoil which created a raised feature with multiple aspects/niches which are more attractive to burrowing rabbits. This can be particularly attractive to rabbits on very flat sites as it gives an elevated free draining sunny position for spotting predators and burrowing.



3. Dune face turf stripping at Sandscale Haws NNR shortly after completion.

Livestock grazing at sites also works well as a rabbit enhancement tool with ungrazed dune sites becoming rank, less diverse, turning to scrub and less attractive to rabbits. The Cumbria dunes sites with the better rabbit populations are all grazed with cattle, sheep or both and had areas of shorter grazed species-rich turf.

All the methods used in Cumbria are long-term enhancement methods and are likely to take years to achieve significant population increases unless rates of natural immunity to introduced diseases increases. However, if these techniques can be incorporated into the annual management of the Cumbria sites managed by partners post project, the best possible opportunity for population increases will be achieved.