Ross Links SSSI – Sand Dune Management

Notes from visits made between 1983 and 2019 Dr Pat Doody

Introduction

Three studies have described the vegetation of Ross Links in detail (Robertson 1955; Dargie 1988 and Dargie 1992). There have also been three others that have looked at vegetation change (Dargie 2004; Doody 2005 and Walton 2005). This note summarises these studies and includes a review of change based partly on visits to Ross Links in August 1983, February 1988, March 2005, and August 2019. The note is divided into two parts: It attempts to draw lessons by comparing the two management regimes based on what information is available, and visits by the author.

Part of the Lindisfarne SSSI and the North Northumberland Dunes Special Area of Conservation under the EU Habitat Directive, Ross Links supports a range of vegetation types from open dune grassland to semi-fixed, fixed grey dune and dune heath. Geologically Ross Links is an area of windblown sand over-lying raised beach material (Figure 01). They are thought to have developed during the Little Ice Age between about 1300 and about 1850 (170 to 700 years ago). Their % $CaCO_3$ content lies between 0.91 and 4.37 with an average value of 3.01. Core samples show a complicated sequence (Wilson et al. 2001), suggesting the impact of human activities has disturbed the stratigraphy with considerable mixing of the underlying sediments.

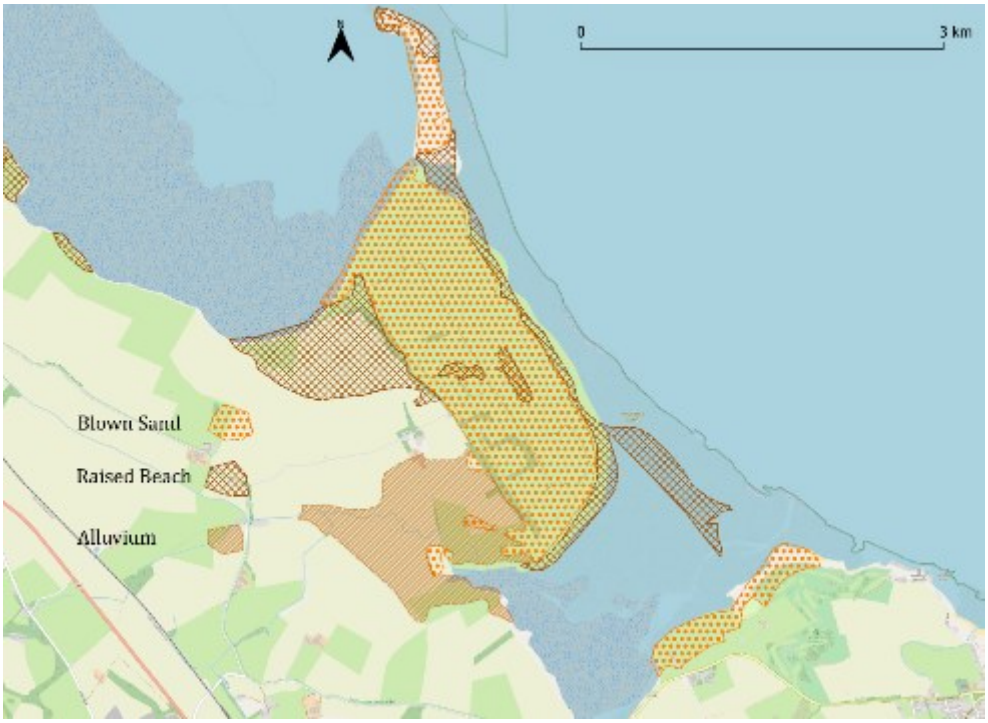


Figure 01 Drift geology of Ross Links based on the BGS 1:50,000 survey map of 1926, republished 1976.

The combination of glacial sands, degree of disturbance and areas overlain with more recent windblown beach sand has a complex mosaic of vegetation. This, and the age of the dune, has helped create conditions suitable for the development of acid dune heath.

Historical Change

At the turn of the last century the extent of blown sand was broadly the same as depicted on the geology map. The 1st Edition OS 1:10000 map shows the vegetation covering the blown sand on this early map as “Rough or heathy pasture”. Historically dune uses have included domestic stock grazing, gathering Marram (for thatching), and scrub (for fuel), and as rabbit warrens. These uses have tended to increase their mobility and helped to prevent the progression from dune grassland and/or heath to

scrub and woodland. At Ross Links their use for the cultivation of rabbits can be traced back several hundred years. Robertson's PhD thesis (1955) supplies useful historical evidence. A map of 1769 shows Ross Links labelled as a "rabbit warren". In reports from 1821 the links are said to have" swarmed with rabbits" with the farmer earning an average of £300 per annum by the sale of skins alone. Hull (1928) describes free-draining areas of the ancient beach sand as having developed "a dry, sandy heath, characterised by short sward and a plentiful growth of thyme." He goes on to say "the rest of the southern area is of lesser interest. Speaking generally, the broad-backed sand-ridges are clothed with bracken, and the hollows between over-run with heather and dwarf willow."

Agricultural impact at the time was limited to digging small ponds for the benefit of the sheep on the links. However, human interference became more significant during the Second World War. So up to 1953 (pre myxomatosis) rabbits had a major influence on sand dune stability and vegetation development here, as elsewhere in the UK. Anti-tank training caused further disruption. Established in 1939 a military firing range caused considerable disturbance. The central part of the site had a moving target railway associated with anti-tank training. Used by the Territorial Army caused destruction of the vegetation and exposure of the underlying sand to erosion. By 1955 the combination of these forces resulted in a complex sequence of vegetation (Figure 02 below). In a note dated 1951, Robertson describes the vegetation as follows:

1. "Dune heath covers a considerable area of the fixed dune;
2. Mosses play a very important part in the initial fixation of the dunes;
3. There are signs of considerable over-grazing, particularly by rabbits;
4. Bracken covers extensive areas of fixed dune;
5. The presence of a large number of moist hollows (slacks) …. occur the bulk of the rare plants for which the links are famous."

A further note in 1952 indicates stock levels are relatively modest with "between 500-600 sheep, a small herd of bullocks and an enormous rabbit population.…. The farm animals appear to graze the boulder clay pasture or the dune heath in preference to the other types of vegetation". He also states, "Almost everywhere, the vegetation is eaten down to a low level and even species that are not generally palatable are sometimes grazed." A daily average catch of 30-50 rabbits was reported, which appears to have made no serious inroads into the population. At the time "Bracken covers extensive areas of the fixed dune." Gassing was reported to have taken place in 1953 and continued in 1954 as part of a county-wide campaign. By the end of 1954 most rabbits are said to have gone (Robertson 1955). There is no mention of myxomatosis, though it is unlikely that gassing alone would have had such an impact.

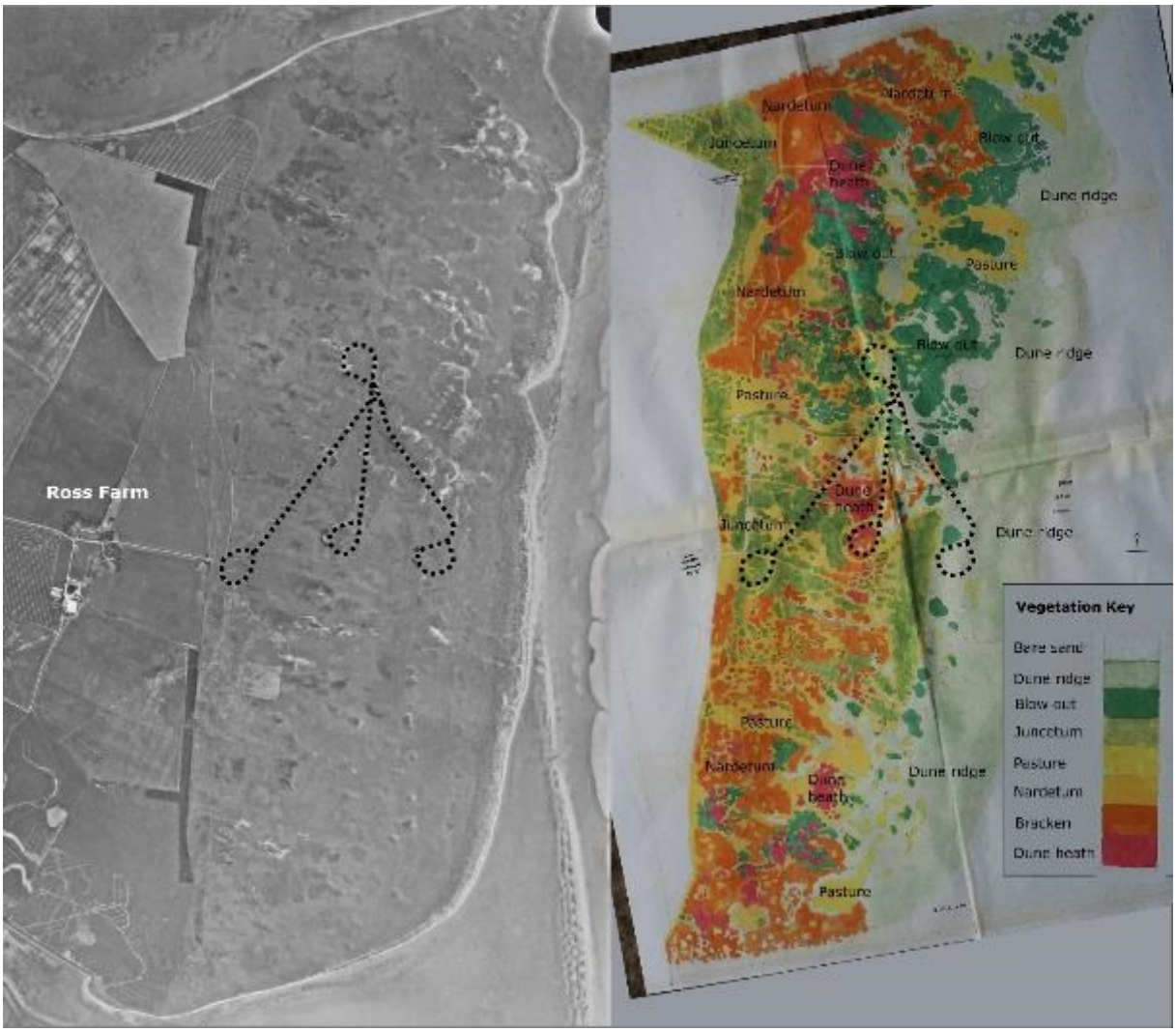


Figure 02 *RAF aerial photograph from 1947 and vegetation map showing the complex mosaics in relation to the target railway, Ross Links, redrawn from Robertson (1955).*

The Nature Conservancy first scheduled as a Site of Special Scientific Interest under Section 23 of the National Parks and Access to the Countryside Act, 1949 in 1954. One of the reasons cited for the inclusion of this area was the acidic nature of the vegetation when compared with the Holy Island dunes (The Snook).

The post-war move away from mixed farming to more intensive arable cultivation or agriculturally improved lay, resulted in the abandonment of coastal areas, including sand dunes, for traditional stock grazing in winter. However, by contrast, where livestock enterprises continued, this took the form of increasing stock levels and extending the grazing period. On Ross Links, this included supplementary feeding on the dune in the mid 1960s. By the 1970s this practice began to cause concern because of its impact on the dune vegetation.

In July 1983, a note described Ross Links as follows: “The fore dunes in this area are fenced from the main body of the dune and overgrown. Behind the fence line the dunes are progressively more heavily grazed. Some areas are fenced and show obvious signs of eutrophication from grazing cattle and associated foddering. However, despite this there are good examples of dune heath.” The note includes a species list reflecting the more acidic nature of the dune compared with The Snook.

Ross Links appears to be typical of dunes throughout the UK from the 1950s to the 1970s, where there has been a general stabilisation of the habitat following a period of instability. It seems clear that up to and during the Second World War grazing and burrowing by rabbits (and later by military activities) helped to create an open, dynamic dune. The demise of the rabbit population in 1953 (and the cessation of military activities) resulted in the progressive stabilisation of the dune system. This tended to favour the growth of coarser vegetation, including Bracken at the expense of open species-rich dune grassland, dune heath and dune slacks.

Using comparisons between surveys of the early 1950s, 1964 and 1986 Dargie (1993) reports details of the vegetation changes. These are summarised as follows:

1. Slight change between the early 1950s and 1964, but "massive" change from 1964 to 1986;
2. From 1964 to 1986
    a. The conversion of a large area of semi-fixed dune to fixed dune grassland took place;
    b. Increased livestock (sheep and cattle) numbers were the force for major change. The associated need for supplementary feeding resulted in high nutrient levels and creation of "semi-improved and improved grassland".

By 1989 following a further visit the site again, the introduction of a more intensive grazing regimes accompanied by fencing and supplementary feeding had caused the development of nutrient enriched soils. This encouraged a variety of weedy species and loss of typical open dune grassland and rare dune heath. This had greatest impact in the south where cattle were over wintered.

Grey dune and dune heath were the two vegetation types most heavily affected by the management on Ross Links. Similarly, dune slacks were a major casualty. In February 1988, there were high stocking rates on the site (particularly of cattle). Despite this much of the dune supported a reasonable, if impoverished, vegetation mosaic. The loss of typical dune vegetation was particularly noticeable near to supplementary feeding stations (Ph 03 and 04).

August 1989 Ross Links taken from roughly the centre of the site

***Ph 03**, (N) with < grazing >Bracken*

***Ph 04** (S) > grazing feeding station mid picture*

Surveyed in the previous year as part of a UK-wide project, agricultural intensification, especially reseeding, and shelterbelt planting, affected large sections of vegetated wind-blown sand. Figure 03 shows the areas of sand dune grassland and heath changed to agriculturally 'improved' or 'semi-improved' vegetation in relation to the boundary of the SSSI.

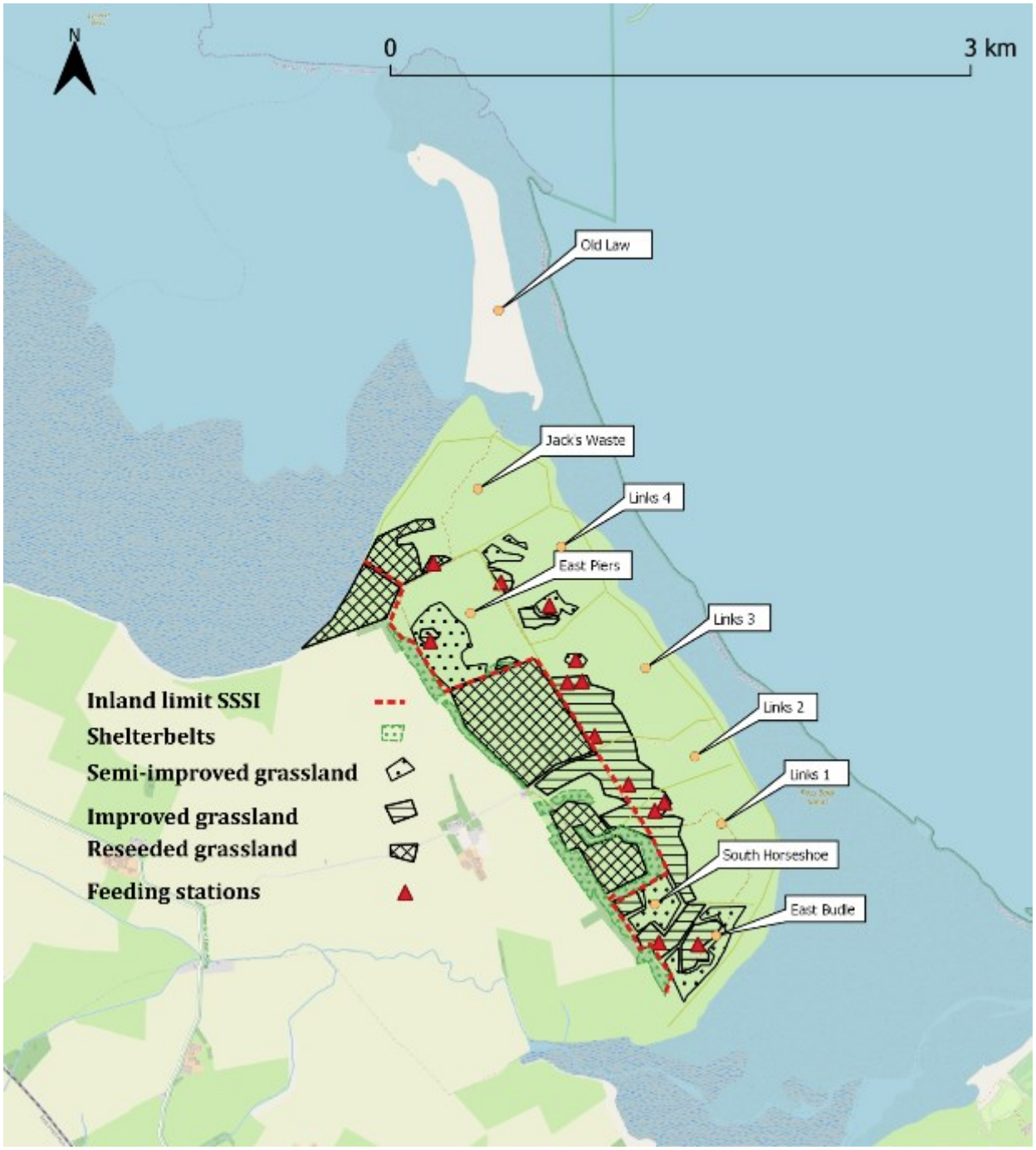


Figure 03 Agricultural change to dune vegetation based on the Sand dune survey 1988 report of (Woolven & Radley 1989).

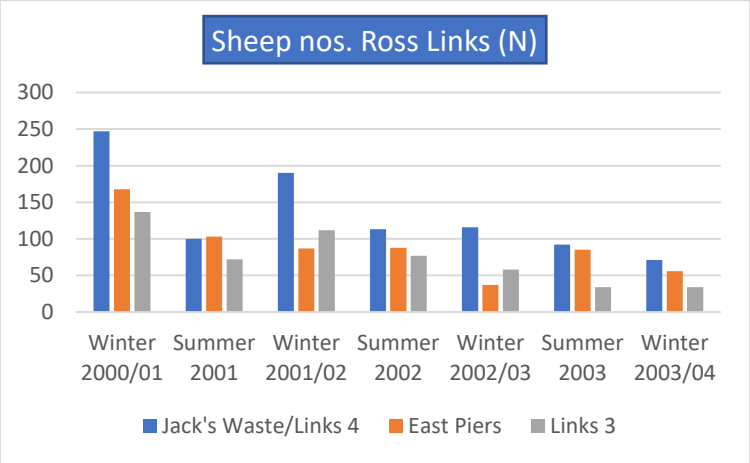
Changes in grazing management for nature conservation

Ross Links was designated as a SSSI Site of Special Scientific Interest in 1954, soon after the establishment of the Nature Conservancy in 1949. From the 1970s concern about changes in the status of the vegetation led to the vegetation surveys reported above. These all led to the same conclusion, namely increased use of the dune for stock rearing continued the degradation of the notified nature conservation value of the site. A note to regional staff in 1988 made recommendations on the approach to negotiations, in summary:

- Stock levels should be reduced;
- Supplementary feeding for other than animal welfare, should CEASE.

As a result, following discussion with the local grazier, in 1995 revisions to the management regime began. A review of the results of these changes took place under a contract to English Nature (Doody 2005) and involved visits on the 14th and 15th March 2005. Segregation of sheep and cattle had taken place, with the former grazing the northern section of the site and the latter the southern section.

Table 01 Stock numbers as reported by the grazier from winter 2000/21 to winter 2004/05



In the northern section (Jack's Waste, East Piers and Links 4 and Links 3) there had been a reduction in sheep numbers (Table 01). This shows the progressive reduction in sheep numbers over the period in all three Units forming the 'northern' section of the links. By summer 2003 and winter 2003/04 the number of sheep on the northern links was 211 and 161, respectively. The revised grazing regime appears to have halted the downward trend in the condition of the vegetation. Overall, this, and the cessation of supplementary feeding helped its recovery to a limited extent (Dargie 2004) and Ph 06.

Ph 06 Typical view of the northern section of Ross Links, March 2005. Note patches of Salix repens, evidence of rabbit activity and bracken/hawthorn in the bottom right of the picture.

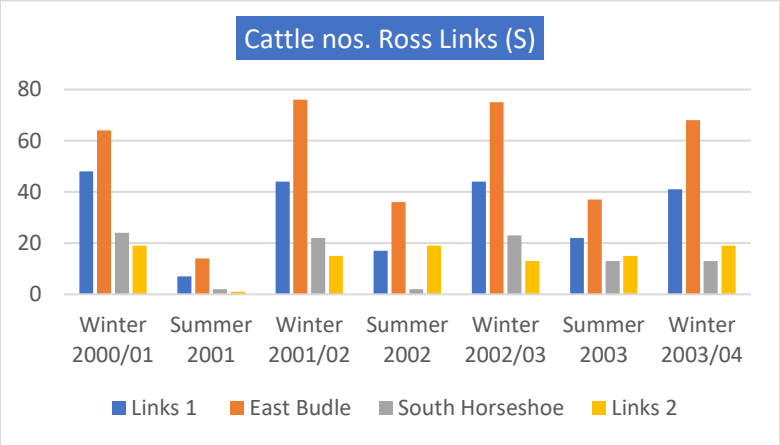
Note the number of sheep are above the 150, year-round, recommended in the report (Doody 2005). At the time despite pressure from sheep and an increasing number of rabbits, there were areas of dune heath and grey dune with lichens and mosses. The limited supplementary feeding that took place did not appear to show any significant adverse effects.

Comparison with the vegetation in the southern part of the site (Links 2, north and south Budle and to a lesser extent Links 1) could not be starker. In areas where supplementary feeding takes place, three things occur:

1. Eutrophication of the vegetation on the dune and the growth of nitrophilous species at the expense of the more normal dune grassland;
2. Over grazing and loss of species diversity;
3. Under grazing on large sites in areas remote from the feeding locations, especially where there is less palatable vegetation such as bracken.

The stock numbers for this part of the site provided by the grazier show the maintenance of cattle numbers throughout the period (Table 02).

Table 02 Stock numbers as reported by the grazier from winter 2000/21 to winter 2004/05



The situation here clearly shows the impact of the levels of stocking and supplementary feeding. The vegetation is impoverished with large areas covered with a dense, species-poor moss covering and extensive invasion by a variety of ruderal weeds. For some distance around the feeding stations the ground is heavily dunged and poached (Ph 07). Towards the outer edges of the dune Marram still survived, albeit in an impoverished form. The difference between the regimes in the north and south can be seen along the fence line between the two (Ph 08). Further south Long Bog and South Horseshoe appear to be less heavily impacted and retain some elements of wet heath and dune grassland respectively.

March 2005 Ross Links

Ph 07 Feeding station (S)

Ph 08 (N) sheep grazed (left) cattle grazed (right)

This part of the site continued to be highly degraded because of the extensive and intensive grazing by cattle. There would appear to be only limited opportunities to restore this vegetation by the removal of supplementary feeding and reduction in stocking levels. Long Bog (Links 2) and South Horseshoe

appear to hold some remaining interest with the latter having the only area of 'calcareous fixed dune' in the southern part of the site according to Dargie's survey of 1998.

Note, the total number of cattle on the site in winter 2003/04 (141) were far above the small herd of 50 bullocks turned out in winter quoted in the Ph D Thesis (Robertson 1955). It is also well above the 0.2 to 0.6 per ha year-round cattle grazing 'best guess' for nature conservation management.

Ph 09 Feeding station in the background and dunging in the southern section Ross Links, March 2005.

Ph 10 Effects of eutrophication on the vegetation, Ross links March 2005

The report (Doody 2005) concluded that apart from South Horseshoe (and possibly Links 2) the loss of conservation interest nearest the supplementary feeding stations is such that reducing the stocking regime is unlikely to result in a restoration of dune heath, grey dune or dune slack, certainly in the short to medium term. The report recommended that all the cattle should be removed. In areas with significant eutrophication (Ph 09 and Ph10) destabilisation of the dune surface should take place and left to 'see what happens'.

It has not been possible to access details of the management agreed under the Higher Level Stewardship Scheme, or any of the later reports. However, the condition assessment of the foredune (Unit 02) and main dune (Unit 03) made in 2009, showed a general improvement in the situation. Specifically – *"The fixed dunes were responding well to the current grazing regime, although over-grazing was evident in parts - mainly due to a thriving rabbit population. A good, and improving, species diversity was evident" ....* "*Localised patches of nettles, ragwort and bare ground were present, as was an extensive bracken patch towards the northern end of the unit (in the area of maritime heath), although this is being managed as part of the HLS so it should be under control in time." …* "*The dune slacks contained a good species diversity*" …. "*Pirri-pirri bur and thistles were found in one quadrat within one slack*".

Visit August 2019

An informal visit in 2019 looked at publicly accessible parts of Ross Links. For these the general appearance of the inland dune was one of a mosaic of marram grass and acid dune grassland. There were signs of Rabbit activity throughout. There were no signs of the heavily eutrophicated vegetation. One supplementary feeding area photographed in 2004 shows the nature of the close-cropped grassland (Ph 11).

Ph 11 *a feeding station looking south from the main footpath from Ross to the beach March 2005.*

Ph 12 *taken from approximately the same location August 2019.*

A well developed foredune and beach was present along the dune front. Between Ross Links and Ross Law, sediment accumulation has closed 'Wide Open'. Here a high-level sand dune/saltmarsh transitional community. The shoreline plants include *Atriplex laciniata*, *Honckenya peploides* and *Elytrigia juncea*.