

Chapter (non-refereed)

Britton, R.H.. 1974 Factors affecting the distribution and productivity of emergent vegetation at Loch Leven, Kinross. In: Annual Report of the Institute of Terrestrial Ecology 1974. NERC/ITE, 50.

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Agrostis/Festuca and *Nardus stricta* grasslands in the area. Three experimental treatments (no restriction of grazing; winter protection from grazing; and absence from grazing) were randomly applied to subplots within each main enclosure at the four sites (see figures 17, 18 and 19).

The absence of grazing caused considerable change in the composition of the vegetation. In general where *Nardus stricta* was formerly the dominant species, *Molinia caerulea* and various heath species have become dominant. On *Agrostis/Festuca* grassland, *Holcus* spp. and *Deschampsia caespitosa* have replaced former dominants. In the absence of grazing, surface litter, soil organic matter and soil moisture all increased. Soil pH showed no definite trend (Dale, 1973).

Subplots which were unprotected, or protected in winter, did not show any noticeable changes in species composition or soil characteristics. The absence of change within the grazed subplots was anticipated since grazing pressure would be the same as that operating outside the experimental areas, the approximate magnitude of which is given in a recent analysis of sheep populations in Snowdonia (Hughes, Dale, Mountford and Williams, 1975). Winter protection from grazing represents an accentuation of the type of management practised in these uplands, where the main grazing flocks are withdrawn for wintering off the mountain and these pastures are virtually ungrazed during the period late October to April.

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 Hughes, R. E., Dale, J., Mountford, M. D. & Williams, I. E. (1975) Studies in sheep population and environment in the mountains of north-west Wales. II. Contemporary distribution of sheep populations and environment. *J. Appl. Ecol.*, **12**, 165–178.

FACTORS AFFECTING THE DISTRIBUTION AND PRODUCTIVITY OF EMERGENT VEGETATION AT LOCH LEVEN, KINROSS

The study of maps, aerial photographs and other documentary evidence has shown that there has been a decline in the extent of emergent vegetation at Loch Leven. By 1972 only 5% of the shoreline of this shallow productive fresh water loch, and less than 0.01% of its area, was occupied by emergent vegetation, the principal species being the Common reed (*Phragmites communis*) and the Amphibious bistort (*Polygonum amphibium*).

The annual production of Common reed was estimated by harvesting and weighing reeds growing within measured quadrats at the end of the period of summer growth. In terms of area, the production of reed was low for a productive lake, and the total annual production over the whole loch was negligible when compared with that of the planktonic algae and submerged plants.

The construction of netting enclosures and wave barriers showed that grazing by wildfowl, and exposure to wave action were major factors in limiting the present day growth of emergent vegetation. Past grazing by domestic stock, and changes in water level and in the abundance of submerged vegetation probably contributed to the original decline.

R. H. Britton

MODELS OF PEATLAND ECOSYSTEMS

A paper is in press which describes an experiment in which clipping was used to simulate a range of levels of blanket peat vegetation by grazing and burning. Replacement of heather (*Calluna vulgaris*) by Cotton grass (*Eriophorum vaginatum*) was more pronounced on more sloping, shallow peat. Cloudberry (*Rubus chamaemorus*) declined under the more frequent clipping treatment (once per year over 13 years) on the flatter, deeper, and wetter peat, but persisted without appreciable change on a more sloping peat surface. Physical stability of the peat surface possibly contributed to the differences of behaviour of cloudberry but the relatively better growth of the Cotton grass on the steeper slopes may be attributed to an inherently greater availability of mineral nutrients. Local catchment size which possibly controls run-on and aeration of the surface layers due to local slope may both influence mineral nutrition, and are being considered for future research. Models of peat accumulation have already emphasized the importance of surface aeration in determining the rate of peat formation and therefore of organic matter turnover.

A. J. P. Gore

PLANT COMPETITION AND ITS EFFECTS ON STAND STRUCTURE

Monocultures, used widely in agriculture and forestry, produce more even yields than mixtures, and they are easier to manipulate. Nonetheless, considerable differences in plant size tend to develop because of inter-plant competition, a process occurring 'when the immediate supply of a single factor necessary for growth falls below the demands'. Although this definition is generally held to apply to interactions between a