

Grazing as a management tool in conservation ( a dutch approach )ABSTRACT

The landscape in the Netherlands has developed under the influence of human activities during many centuries. Old farming practises increased the ecological variety due to the constant transport of nutritious matter from a wide surrounding to the agricultural fields near the residences; thus giving rise to many local gradual transitions of trophic levels of the soil, creating a wide range of ecological niches for a diversified vegetation development. Modern farming practises of the 20th century are levelling this variety due to the use of fertilizers and advanced draining technics.

It is in the interest of nature conservation to preserve parts of the man-made landscape in the former way. Generally spoken this can be done by applying the old farming practises which however constitute a rather expensive method nowadays. Permanent grazing at very low stocking rates presents an alternative method with good results for this purpose.

Cows, horses, sheep and goats are used at different places. The impact of cattle behaviour on the system in the sense of doing yearly the same things at similar places with equal intensity can be compared with the impact of old farming practises. Gradually in time decreasing stocking rates lead to a higher biological variety of the area in vegetation structure and in plant and animal diversity as well.

GRAZING AS A MANAGEMENT TOOL IN CONSERVATION ( a Dutch approach )

A grazing research program started in the Netherlands in 1971 in order to find proper managing methods for open spaces in nature areas. By intensification of the agricultural use during the last half century many sites of highly biological interest disappeared. The management of the remnants of the old cultural landscape, which got the status of Nature Reserve became a problem: - Carrying out old farming systems has lost economical significance and would have been very expensive;

- When nothing is done to manage grasslands and heath vegetations most will become shrub and woodland in a period of 15 to 25 years. By abandoning former cultural fields non-management implies the loss of the species-rich communities of the transition zonations from open space to woodland.

Within the framework of reallocation programs a part of the agricultural area was given other destinations. Where those old fields could be integrated in existing nature reserves, some kind of management is requested to avoid monotonous rough vegetations poor in species developing to a final bush of woody plants. A grazing management of those fields together with parts of the nature area aims to start a restoration of the area by gradually fading away the straight cultural lines.

The procedure of the research runs as follows:

The first question on " What does the area look like " can be answered by making inventories ( flora, fauna, historical management records ) and mapping ( vegetation, soil ).

After a new grazing management has come into force, preferably with a control area with another or no management, the second step of the program is to answer the question " What is happening in the area " involving research of husbandry behaviour and dispersal and recording direct effects of grazing, trampling and dunging.

The third question is " How does the area change " and this can be answered by repeating the activities of inventoring and mapping which is usually done after a 5 year period. The above-mentioned procedure provides the possibility to determine the effect of each change on the behavioural aspect of husbandry . By comparing vegetational changes under different management conditions those effects due to a single management method become clear.

The main criterion to judge if a certain practise suits the management objectives is the appearance of plant species bound to 'ecotone' conditions together with the disappearance of plants indicating human disturbance; species enrichment ( flora & fauna ) is valued positive; in most cases this is coupled with a gradual decrease of available nutritious matter in the soil. The main objective for nature conservation purposes is to create situations where management practises will lead to the highest possible biological diversity as a result of the natural conditions of soil- productivity.

The fourth point of the program finally is a closer research

-1st into the ecology of those species, which appear to have indicatory value for the management practise in order to refine standards and

-2nd into those effects of a grazing management on the vegetation which come about in interaction with other animals, especially those living in and on the soil such as rabbits, moles, dungbeetles, ants, worms etc.

Grazing experiments for nature conservation purposes are going on in about 10 areas of different types and sizes ( 10 to 500 ha ); dune-saltmarsh , heathland , marshland , former agricultural areas as meadows and cropland and quite new grounds in recently diked areas.

Husbandry behaviour studies have been carried out on young cattle, horses , sheep and goats. In the restricted time of this paper I give you some results of this aspect of the program and ~~emphasize~~ emphasize the significance of herbivore behaviour for this management \_ objective .

It has become clear in all areas that husbandry, when left alone for a season or a year in half-natural surroundings, develops a very constant behaviour pattern with slight seasonal differences. Some parts of the area are heavily influenced, some moderately, some lightly and if the stocking rate is low there will always be parts with no influence at all; as the places from heavy to no influence are yearly constant an impact gradient will arise with a varied vegetation structure and -composition.

To measure herbivore impact, - including all aspects grazing, trampling, resting combined in presence-frequency for the different parts of the area, - the droppings can be used; a plot with twice so many droppings as another plot indicates that animals have spent twice so much time there. The morphology of cow droppings in the field indicates even which kind of activity the animal has performed there: grazing, resting or just walking-through.

The constant behaviour pattern observed in a community allotment area under seasonal grazing management with young cattle raised the question " How do they know to behave in the same way as their predecessors years before". The dominant animals were always operating in the rear of the herd and did certainly not appoint the direction where to go. All herd movements recordings except one in this area of 300 ha show a daily clockwise movement from the sleeping place in the SE part through the western part to the North at noon and through the East to the SE part back in the evening.

Herd movements of cows and horses in other areas, especially those with a size exceeding 100 ha, gave the same clockwise daily pattern. The reason is quite simple: when cows and horses start grazing after a rest period, they always choose the direction opposite to the sun ; even cows on normal production meadows will make such a start, but usually can't go on in this way due to fences. Out of 120 herd movement recordings one anti-clockwise direction was observed during a foggy day with diffused light.

As a result of constant herbivore behaviour patterns under the condition of low stocking rates areas can be developed to optimum variety in vegetation structure, plant and animal life. Grazing research for nature conservation purposes in the Netherlands differ mainly from similar research elsewhere in that economic profit is not used as a criterion for management plans and that the results are not considered from range improvement as generally understood but from biological diversity of the area.