

This is the published version of a paper presented at the Proceedings of Fábos Conference on Landscape and Greenway Planning, held in Budapest, Hungary, 8-11 July 2010.

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Original publication: *Proceedings of Fábos Conference on Landscape and Greenway Planning 2010* : Budapest, July 8-11. : proceedings of full papers / ed. Julius Gy. Fábos [et al.] ; org. by Corvinus University of Budapest Department of Landscape Planning and Regional Development, University of Massachusetts Amherst Development of Landscape Architecture and Regional Planning. - Budapest : Corvinus Univ. of Budapest, 2010.  
ISBN: 978-963-503-409-3

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## **Implementing multifunctional greenways in Sweden – challenges and opportunities**

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### **Background**

Greenway planning has a short tradition in Sweden compared with other European countries (Von Haaren & Reich 2006) or the United States (Walmsley 2006). In Sweden, there are still relatively large natural areas, the population density is low and public access to the countryside is comprehensively provided in legislation. These factors have contributed to the fact that greenway planning with few exceptions has been very little developed until recently. However, the need for greenway planning in Sweden has been recognised in the last decade (e.g. Sandström et al. 2006), especially in areas with accelerating urban sprawl into intensively used agricultural land, for example in the most southern part of Sweden, Scania. The rapidly increasing population, in particular in the greater area of Malmö, Sweden's third largest city, has led to a large expansion of residential and commercial areas as well as new transport infrastructure. The surrounding agricultural land is intensively used, since the soils there are the most fertile in Sweden and Scania is one of the most important areas for cereal production in Sweden.

The intensification of agriculture has led to decreased access to the countryside. Over a long period, most pastures and meadows have been converted to arable land, which is inaccessible for most of the year. In addition, land units have been enlarged, the number of farm tracks has been reduced to a minimum and other linear landscape elements have been removed (Ihse 1995). This means that the increasing population has very limited access to the surrounding countryside, particularly in terms of everyday recreational possibilities, despite the importance of green infrastructure in urban areas for health and recreation being widely acknowledged (e.g. Tzoulas et al. 2007, Matsuoka & Kaplan 2008). Another important aspect to mention is that Scania is one of the areas in Europe with the greatest density of horses per capita and horse riding therefore comprises a significant proportion of outdoor recreation in the area. The situation of increasing population, ongoing intensification of agriculture and decreasing access to the countryside has led to growing awareness among municipal planners of the lack of access to outdoor recreation in peri-urban areas.

The way in which greenways are designed in Sweden at present originates from a prototype created by an estate owner on his own initiative at the end of the 1980s (Regnéll 1994). At that time, farmers were required to have a certain amount of land

set aside as fallow to receive agricultural subsidies. Instead of having these set-aside areas as large blocks, this particular estate owner suggested forming them into strips around fields for walking and horse riding. He created a network of 14-km long greenways by sowing 4-m wide strips on arable land along the margins using a grass seed mixture. He named these '*beträda*', a term which combines the Swedish words *beträda*, meaning to walk on/enter, and *träda*, meaning fallow. The Swedish Board of Agriculture refused to pay subsidies for this type of set-aside, but the municipal authority liked the idea of providing access for walking and horse riding and paid the farmer compensation – actually up to the present time. Thus when using the term greenway in this paper, we refer to a linear feature with a width of at least 2 metres, sown with a seed mixture including grasses and usually established on agricultural land. As discussed later in this paper, such greenways can be varied in terms of seed mixture and planting depending on their intended function/s. Paved paths, gravel paths or simple walking paths are not included in the definition.

The objective of this study was to explore challenges and possibilities in implementing multifunctional greenways that improve access, recreational possibilities and biodiversity in intensively managed agricultural areas (e.g. Von Haaren & Reich 2006). The study was carried out within the project 'Multifunctional greenways as a tool for strategic landscape planning - proposals for design and implementation in peri-urban landscapes' and was conducted in Scania, southern Sweden.

## Methods

The first stage of the study consisted of an internet search. The keywords used were the Swedish terms and possible synonyms for greenways, combined with the names of a selected number (17) of municipalities in Scania or alternatively the term Scania. The municipalities were chosen from western Scania, since the population density is greatest here and agricultural land use dominates. In the second stage of the study the 17 municipal authorities were contacted and asked four questions about greenway establishment within the municipality. In each municipal authority, at least one person responsible for working with green structure planning was contacted. Meetings were arranged with two municipal authorities to discuss the experiences these two authorities have had with greenway implementation. These two particular authorities were chosen for further study since one has managed to establish three different greenway networks and, together with the other, has an ongoing project (with national funding) regarding a greenway network. As a complement, a one-day seminar was held with national (Swedish Board for Agriculture), regional (Scania County Council, County Administrative Board in Scania) and municipal authorities and the national farmers' organisation (LRF) to discuss possibilities for greenway implementation in Sweden.

To examine the biodiversity of greenways, species numbers of flowering plants and insects (butterflies and bumblebees) were studied in existing greenways and in experimentally sown wildflower strips established at the Swedish Agricultural

University (SLU). The greenways were situated near Lund and Staffanstorp and were sown with a mixture of grass species, were at least 4 metres wide and were cut several times during the growing season. The grass sward was generally quite short due to these repeated cuts. Some of the greenways were planted with trees and in one network there were bush plantations. The experimentally sown wildflower strips at SLU were established between 5 and 15 years ago with a mixture of grass and wildflower species and are cut once a year in late July/early August. Further information on the methodology can be found in Haaland & Gyllin (2010).



**Figure 1. Experimental greenway at the Swedish University of Agricultural Sciences. Sown wildflower strip combined with tree planting. (Photo: Mats Gyllin).**

## **Results**

The internet search on greenways in municipalities and regional documents gave a clear indication that greenways are viewed as a suitable and desirable measure to enhance access and recreational possibilities. This was the case both in the context of general green structure planning at municipal level and at the more detailed planning scale carried out in the context of exploiting new areas for residential areas. Of the 17 municipal authorities contacted, 16 had mentioned greenways in some kind of planning document as a suitable measure to enhance access for people, while several also mentioned the possible function of greenways as wildlife corridors. However, a closer look at the municipal documents that mentioned the word greenway revealed that only five municipal authorities had actually established greenways.

The short telephone interviews with municipal employees provided information on implementation approaches, challenges, problems and obstacles to implementation. The interviews resulted in slightly different results regarding intended plans compared with the documentation found on the internet. Although 16 municipal authorities planned or recommended establishment of greenways according to their planning documents, only six had concrete plans to establish new greenways in the near future (most of these had established greenways previously). Five municipal authorities confirmed that they had established greenways (four as indicated by the internet search, one which did not manage to carry its plans through as intended, but

another which had established greenways even though this could not be concluded from the available documents). Thus there was an obvious discrepancy between municipal intentions and visions regarding greenway implementation in planning documents and their actual interest or abilities to put them into practice.

Interestingly, nine municipal authorities reported that they used privately owned buffer zones along water courses in their municipal green structure planning. These buffer zones have been established by farmers in order to qualify for agricultural subsidies for prevention of nutrient run-off from arable land into water courses. Buffer zones look like greenways after their first cut, are a minimum of 6 metres wide and are sown with grass. They can function well as greenways, when planned as such, but there are no requirements to create networks (the minimum length is 100 m). In addition, the buffer zone system can be dynamic since farmers are allowed to plough them up and establish new buffer zones at other locations. The most critical point is that according to the subsidy regulations, buffer zones are not intended to be used by the public and the farmer is responsible for repairing any damage to the grass sward (which is easily caused by horse riding, especially when the soil is wet).

Municipal authorities were also asked about problems and obstacles regarding greenway establishment. These problems in greenway establishment were classified into two main categories: Lack of resources (time, labour and funding); and reluctance of landowners and farmers to open their land for public access. In a few cases the problem was lack of interest. Only one municipal authority reported that greenways were not needed in the municipality. Lack of resources frequently resulted in plans for establishing greenways never going further than drawing a line on a map and/or a wish expressed in a municipal plan. Prioritisation of resources is always necessary – especially within the green sector – and greenway implementation is seldom at the top of the agenda. In other municipal authorities the interest and plans existed, but landowners were unwilling to cooperate. In combination with a lack of resources, time-consuming negotiations with landowners can easily result in implementation plans not proceeding further.

In most of the municipalities where establishment of greenways succeeded, the projects were regionally or nationally funded. That meant that a highly motivated individual within the municipal authority had written a project application, obtained funding from regional or national authorities and was required to report back on the progress of the project. However, there were cases where municipal authorities had obtained project funding for greenway implementation but where the plans had to be abandoned subsequently because of the resistance of landowners. In one case, the municipal authority was able to reach agreement relatively easily with a single owner of a large estate and thus a whole greenway network is going to be established on one landowner's land without major problems.

Another solution some municipal authorities have adopted for facilitating greenway establishment is to use municipal land or to acquire land especially for the purpose of constructing greenways. Thus municipal authorities are actively buying e.g.

farmland in peri-urban areas not only for new residential housing areas, but also for recreational purposes. The farmland is in some cases kept as such and leased to farmers. This solution can be very costly, but allows the municipal authority to plan greenway networks more freely.

The meetings with employees of two municipal authorities provided deeper insights into how greenways are planned, designed, established and managed in these authorities, including challenges encountered during the process. One of the two municipal authorities has managed to establish several greenway networks. After long and time-consuming negotiations with landowners, 10- or 20-year land leasing contracts were signed, with the municipal authority paying for greenway establishment and management and land leasing. It has to be pointed out that the municipal authority's resources did not allow landowners to be fully compensated for their loss of income compared with cereal production, which partly explains the landowners' reluctance to establish greenways. Other major complaints expressed by landowners were damage to crops by the public when allowed more access, disturbances (including in hunting areas) and littering. The municipal authority has also succeeded in designing some greenways in a way that is more attractive to visitors and that improves biodiversity, e.g. through having bush and tree plantings. The other municipal authority had to give up greenway implementation – even though it has obtained funding – after heated arguments with the landowners.

The one-day seminar with municipal, regional and national authorities and organisations resulted in an exchange of views and experiences and produced further possibilities on greenway implementation. The importance of creating greenway networks for multiple purposes was underlined. The farmers' organisation emphasised the difficult situation for farmers, with a huge number of official demands made on farmland today for various purposes – including allowing access to the public. The possibility of allowing greenways to qualify for farm subsidies has been discussed in Sweden since the first greenways were established, as the original idea for greenways in Sweden was to fund them via agricultural subsidies. There are still no national regulations that would allow for such subsidies, which would hopefully make establishment of greenways easier in cases where financial compensation of farmers is a major problem. Nevertheless, it appears that at the regional level in Scania, the County Administrative Board has recently started to subsidise the establishment of greenways and bridleways in the form of specific projects. That means one or several landowners can apply for money to carry through a project on establishment of greenways or greenway networks. An alternative approach to greenway establishment is for interest groups to negotiate with landowners over networks and pay compensation for use and management measures. This has been the case e.g. in the establishment of greenways mainly intended as bridleways (Larsson et al. 2008). The municipal authority in this case played the role of providing a common forum for discussion between farmers and horse riders.

Greenways in Sweden are regarded as a tool not only to create access to the countryside, but also to enhance biodiversity in intensively used agricultural areas. Planning documents often mention objectives such as creating corridors for species movement or habitat functions. The studies on diversity of selected species (flowering plants, butterflies and bumblebees) clearly indicated that common greenways are very species-poor. This is not surprising, since cut grass margins often do not offer resources for a wide variety of species. Thus, the abundance of insects observed was very low. The experimental wildflower strips that were established at the Swedish University of Agricultural Sciences up to 15 years ago in connection with other purposes (research project, amenity around the campus) were much more diverse. The abundance of butterflies was on average 20-fold higher and that of bumblebees 100-fold higher (per recorded 100 m and visit) in the experimental strips than in conventional greenways. The number of flowering plant species per visit was twice as high in the experimental strips as in conventional greenways. The total number of plant species is estimated to be much higher, but is still to be investigated. Greenways with bush plantations supported a higher number and abundance of species than greenways without any plantings. More detailed results can be found in Haaland & Gyllin (2010). The function of greenways and experimental flower strips as wildlife corridors in the study areas is questionable, at least for the insect species investigated, since nearly all recorded insect species were widespread, common and assumed to be able to disperse even without any corridor.

## **Discussion and Conclusions**

It can be concluded that many municipal authorities in southern Sweden are aiming for greenway implementation according to their planning documents, but that the majority of these authorities have not managed to set their plans into practice. One explanation is that there are no binding national or regional planning systems in Sweden (Busck et al. 2008) and that municipal green structure plans are advisory, but not legally binding. Thus, recommendations from green structure plans are often not considered at the legally binding detailed planning level. Sandström et al. (2006) identified the lack of necessary resources and the lack of knowledge as regards planning for biodiversity as problems in green structure planning. In cases where greenway establishment is being actively driven by a municipal authority, access to land on which to establish greenways emerged as the most crucial problem, followed by lack of resources. The reluctance of landowners to open their land to public access has also been identified in several other countries (Ryan & Walker 2004; Von Haaren & Reich 2006). An unexpected result of the study was that municipal authorities included buffer zones along water courses on privately owned land in their greenway planning to a comparatively large extent.

Successful greenway implementation is often a combination of several factors, such as additional resources (externally funded projects), especially interested and proactive people within the municipal authority, positive landowners or available municipal land. For successful greenway implementation, it is important to offer and exploit a variety of options in combination with each other that are:

- initiated and funded by municipal authorities (if possible with aid from regional or national authorities) in negotiation with landowners,
- initiated by interest groups or the public in negotiation with landowners and funded by interest groups, the municipal authority and/or through agricultural subsidies,
- initiated by landowners and funded through the municipal authority and/or agricultural subsidies.

There are high expectations that the possibility to obtain farm subsidies for recreational activities will make greenway establishment much easier, but the outcome has still to be evaluated. The hope that EU agricultural policy will facilitate greenway implementation has also been expressed in other countries, for example Germany (Von Haaren & Reich 2006).

Greenways in Sweden are regarded as a tool not only to create access to the countryside, but also to enhance biodiversity in intensively used agricultural areas. Planning documents often mention objectives such as creating corridors for species movement or habitat functions. In principle it should be possible to combine the two aims to create access and to improve conditions for biodiversity in intensively used agricultural landscapes, but few efforts have been made so far to design multifunctional greenways. Tree and bush plantings have been carried out in some cases and have been shown to increase variation, which in turn is likely to be appreciated by visitors and to be of benefit to wildlife. Nevertheless, it has to be pointed out that these types of plantings are not compatible with farm subsidies for agricultural land, since land has to be ploughable to qualify for subsidies, which automatically excludes tree and bush plantings. Thus subsidies can facilitate establishment, but limit the design options. Greenway design is therefore easier to optimise regarding multifunctionality on municipal land.

Sowing wildflower strips along greenways could greatly enhance their biodiversity. These strips could create habitats or resources for meadow plants and insects, which in turn would benefit other groups of species, for example birds. Including wildflower strips within greenways would also increase their attractiveness to visitors. Although sowing wildflower seed mixtures would improve greenways, it will not be easy to implement this type of greenway. There is no particular demand from the public to design greenways in particular to enhance biodiversity, as the focus is on access issues (Larsson et al. 2008). Landowners are already hard to convince about allowing access, so asking them to also accept wildflower strips seems difficult in the current situation. Nevertheless, the Swedish Board of Agriculture plans to subsidise the sowing of wildflower strips along field margins and water courses in the future. This means that instead of aiming for a multifunctional network, green structures might have to be designed separately for different interests (biodiversity, access). However, municipal authorities could provide a good example in designing multifunctional greenways on municipal land.



In summary, we see great potential for greenway planning in Sweden if farm subsidies are introduced for recreational activities, initiatives by interest groups are encouraged and municipal green planning is improved.

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