

# **Green structure under pressure – about knowledge in planning processes. Case study from Oslo**

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## **1. Introduction**

Compact city development has obtained a hegemonic status as a model for sustainable urban development in the Norwegian context as well as internationally. However, cities are also dependent on the natural environment to function properly, according to the report "Norway's Environmental Targets" (Norwegian Ministry of the Environment, 2012). A sound principle of sustainable urban developments is consequently to take care of continuous green structure with green corridors that link urban districts and green spaces with surrounding countryside. Such areas are important for the health and life quality for the urban population, but the authorities also underline the areas' important function retaining a variety of habitats that support biodiversity in and around urban areas. Knowledge is also important: "Research and monitoring provide us with a sound knowledge of the environment, which is the foundation for our knowledge – based environmental management regime." (Norwegian Ministry of the Environment, 2012 p. 50). What kind of knowledge is then needed? The report underlines knowledge about population status of species, the range of and ecological status of habitat types, and the impact of environmental pressures. There is less emphasis on "everyday nature". The aim of the article is to investigate how knowledge about nature diversity is viewed and used in green structure planning, and we use a case study from Oslo as an example.

## **2. Background**

There are few studies addressing how nature diversity is handled when making plans for urban green structures. A Norwegian study showed that the theme had little attention in municipal planning (A.-K. H. Thorén & Opedal, 1997). The focus was on recreation and outdoor activities. This is also found in a Swedish study (Sandström, Angelstam, & Khakee, 2005). Previous studies have also pointed to the problem of making knowledge on nature diversity useful for planners as a main obstacle (Ernstson, Barthel, Andersson, & Borgstrom, 2010; Sandström et al., 2005). In spite of knowledge about species, the planners were unable to translate this knowledge into a landscape ecology/ structural approach. There is little awareness about the various scales that is necessary for ensuring the ecological functions of green areas, including the local green area scale, city scale green networks and at regional level. Of central importance are midscale managers who may be able to view the whole green network and act as a node between the local and regional network. In this study of Stockholm, Ernstson et al (2010) also showed lack of knowledge and suboptimal organization of the work, resulting in lack of connection between the ecological importance and the land use categories. However, some positive examples exist. Löfvenhaft et al (2004) has shown alternative practices in mapping and valuation in order to integrate biodiversity issues in spatial planning. The general impression, however, is that there are few examples of municipal planning practice within this field, particularly few investigation about the extent and type of knowledge that is used, how to assess the values of nature and the to

which degree knowledge about nature diversity has influenced the content of green structure plans. The aim of the article is to investigate this field more in depth.

### 3. Theoretical perspective, goals and objectives of the study

Figure 1 shows our theoretical approach. While framing the perspective on urban nature is important in determining what type of scientific knowledge that is relevant, applying knowledge in the planning and policy making is not a simple linear model (step 1). Science and policy making are mutually constitutive, produced in complex social, cultural and political contexts. Hunt and Shackeley (1999) argue that there are three poles. One pole is the scientific, academic way of producing knowledge, where academics address other academics (step 2). A second pole is the translation of knowledge that meets the planners and policy makers' need with a strong emphasis on application and use (step 3). Landscape ecology is an example where knowledge about species and habitats are translated into space requirement, which is useful for land use planners. In this pole scientists address the planning community. The third pole is the bureaucratic knowledge (Step 4) where bureaucrats address other bureaucrats as well as scientists and other stakeholders involved. Public planners operate within a planning institution with their own norms and rules for conduct, including e.g. requirements for due process, viable options, local social and political context, allocation of duties and responsibilities. In planning, the bureaucrats/planners have to secure a planning process that is open, transparent, democratic ensuring important stakeholders to be heard. Another example is that land use planners have to bear property ownership in mind, as public intervention is much easier on public than on private land.

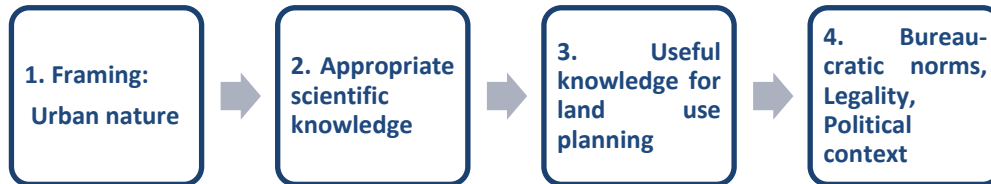


Figure 14 Stages in the knowledge/planning interface

Based on the model the research questions addressed in this paper is the following: 1) which framing or concepts is embedded in nature diversity values in the green structure plan? 2) What is the scientific knowledge about nature diversity values that the plan is built upon? 3) To which extent is the knowledge base translated into useful knowledge for planners? 4) To which extent has bureaucratic norms affected the knowledge base used by planners?

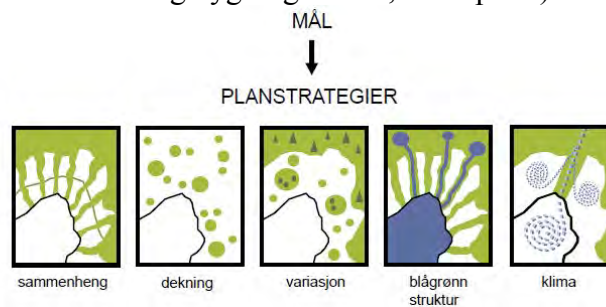
### 3. Methods

The project is based on case study methodology and the case is Oslo's green planning with emphasis on nature diversity. By Norwegian standards Oslo must be regarded as pioneer in this field, and in line with Flyvbjerg (2001) characterized as a best case and thus an instructive example. To answer the research questions, we conducted a document study of the last green planning document that has been out for consultation since 2009, but not yet adopted (Oslo kommune Plan- og bygningsetaten, 2009). We have also analyzed the consultation documents related the plan and conducted some preliminary interviews with key persons in the municipal administration.

## 4. Results

Oslo's current green structure plan was adopted in 1993. The plan was considered so groundbreaking that it received a price for the best Norwegian plan that year. One of the reasons was the innovative way in which biodiversity was handled based on landscape ecological approach. Still it took many years before the municipality initiated a revision, but in 2005 it was decided to renew the plan. One of the reasons was extensive protests at the loss of green areas due to the densification policy that accelerated from the end of the 1980s but also new laws and policies in the environmental field. A draft for a new green structure plan was finished 2009 and is still discussed among the politicians.

**Framing or concepts:** The goals of the green structure plan correspond with national environmental objectives (Norwegian Ministry of the Environment, 2012) which is to ensure a structure of parks, wildlife and recreation areas within the built up area of Oslo. In the plan this is referred to as the blue-green structure because the municipality places great emphasis on the concept of an interconnected structure of green areas and the blue; rivers, streams, lakes etc. ” The structural approach to the green areas are no novelty in Oslo and has remained unchanged since the first overall plan from 1929 (Hals, 1929), albeit described as park system. The term green structure is defined as a “web of small and large nature areas in the city” also called “green infrastructure” (Oslo kommune Plan- og bygningsetaten, 2009 p.16.).



**Figure 15 gives a good visual impression of the framework of the plan: Coherence, coverage, diversity, connection between blue and green structures and finally climate (Oslo kommune Plan- og bygningsetaten, 2009 p. 11)**

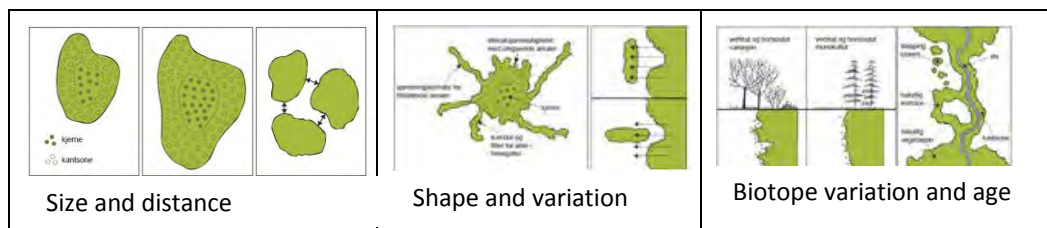
Figure 2 reveals the multi-functional approach of the plan.

**Scientific knowledge about nature diversity:** The planning and building department of the municipality was responsible for the planning process, while expertise on outdoor recreation and biodiversity were found in another agency, Recreation and Leisure Service. The basic survey of relevant areas for future planning, the so-called “green area register”, was not performed by the green expertise but by the planning and building authorities. Students did the field work. The survey includes unbuilt green spaces, secured by law and also unsecured areas. Nature categories’ included were: water, forest, trees, lawn, meadow, other vegetation, artificial surface.

The municipality’s nature database is mentioned as an important source to identify biological diversity. The database includes registration and valuation of nature types, areas for wildlife and rare and endangered species. Although this was intended as an important tool for maintaining biodiversity in Oslo in daily planning (Pedersen, Nyhuus, Blindheim, & Krog, 2004) it does not

appear that the tool is fully utilized. Consultative statement to the plan from the Recreation and Leisure Service illustrates the problem. They raise questions as to how the selection of important nature types has taken place and how they are presented on the map.

**Translation into useful knowledge for planners:** Landscape ecological approaches are given relatively much space in the plan. The purpose of the approach is to ensure the structure as a whole and to cover a wide range of nature qualities. Figure 3



**Figure 16 Landscape ecological principles presented in the plan. (Oslo kommune Plan- og bygningsetaten, 2009- p. 42) with reference to Dramstad et al (1996)**

The plan introduces so-called ecological zones consisting of large undeveloped green areas, areas along watercourses, contiguous areas along the coast, etc. It is not stated what connection there is between the ecological zones, green area register, nature type survey and landscape ecological principles. Recreation and Leisure Service also is questioning this and does not consider what is stated as ecological principles as sufficient.

Most of the suggestions that came in early stages are largely met according to the plan. By using zoning categories, guidelines, etc. it is shown in a detailed way how a multi-functional green structure must be maintained. Land use categories are indicating which areas should be public sector's responsibility, and some of the areas with specified nature values are included. General provisions and guidelines also specify how to deal with blue and green values on private land, but there are no map information revealing prioritized areas. In general, it appears that the preservation and development of the vegetation has had an impact of the plan. The requirements and arguments seem mainly to be related to aesthetics and recreation and not to nature diversity. It is stated that there is a need for further registration and protection of biological diversity and it is proposed to carry out a comprehensive mapping of biotopes in the building zone.

**Knowledge base used by planners and bureaucratic norms:** To identify what is meant to be private and public responsibility is central in planning. Thus it is interesting to see whether there is any connection between the knowledge base and what the plan is meant to solve. In this case the basic knowledge input comes from the "green area register" which mainly gives an overview of publicly owned land or areas planned for public ownership. The nature types are however on public as well as on private land. The main aim of the plan seems to be to protect what one may call the public blue and green structure, but there is some confusion regard to which areas are included. Many of the various values and functions related to the blue green structure of the plan including regulations and provisions are namely to found on private land. Valuation and use of norms is central to the planners. In this case, we have identified using the standard classification system which goes from very important (national value), important (regional value) or locally

important (local value) for biodiversity. It is not clear how these values are weighted relative to each other, and there is no mapping of this material in the plan.

## 6. Discussion and conclusion

The perspective on nature presented in Oslo's green plan is quite clear, it's a multifunctional structure/ system of blue and green areas. The knowledge used in the plan is mainly about areas publicly owned or planned for public use. This is quite close to the American greenway thinking (Turner, 2006) where the green structure is viewed as a multifunctional linear system. The idea that green areas should be incorporated in a system has long traditions in Oslo, showing the importance and strength of the concept. Indeed, "the blue and the green" has been used in branding Oslo in the international competition for attention and investment.

Our findings is in line with both Sandström (2005) and Löfvenhaft et al (2004) showing that the knowledge base is not good enough. In addition, the competencies on nature diversity within the municipal administration has not been used in a satisfactorily way, also in line Sandströms findings.

To which extent is scientific knowledge translated into useful knowledge for planners? The landscape ecological principles referred to in the plan, are useful for handling nature diversity at a system level. However, our studies reveal that there is no connection between the use of the scientific knowledge of the urban nature and the analytic tool provided by the landscape ecological principles. Löfvenhaft et al. (2004) have shown that the use of indicator species is a way to integrate biodiversity issues in spatial planning. Oslo's well developed Naturbase (nature base) is a good foundation for choosing well suited indicator species that could have been used in the same way. The lack of planners with competencies within nature diversity in the planning process may have contributed to the lack of taking advantage of this opportunity. The way the green areas were mapped did not help in this respect either. There is in other words a fundamental mismatch between the knowledge base and the analytical tools that were presented.

In principle, nature diversity does not relate to property rights and boundaries, as pointed out by national authorities in their guidelines for managing the green structure. (A.-K. H. Thorén & Nyhuus, 1994). Consequently, it is not sufficient to map the publicly owned areas, all blue-green areas in the urban area should have been mapped. A method for doing so has been developed (K. Thorén, Due Trier, Lieng, & Aradi, 2010). Oslo municipality has chosen to concentrate on public blue-green areas. This is rational seen from a land use planner's view, but does not take care of nature diversity and ecosystem thinking. Ernstson et al. (2010) have shown that it is possible to think differently in a nested scale- and network governance perspective.

For planners, norms and value assessment is important when negotiating conflicting demands on land use. In the Oslo case, we found that the planners had to take the traditional hierarchic perspective on nature values from national, via regional to local into account, as implementation of national policy. The starting point was *Naturbase* (the nature base), representing an emphasis on protection of nature diversity. From the public hearing of the plan, other perspectives were presented, e.g. by the cultural heritage authorities at local and national level. They ask: what kind of nature is of importance? What about nature that is viewed as important for human use and

experience? Barring and Grahn (1995) has documented that people in general value a varied green structure highly. The question is: what kind of knowledge need to be produced in order to be taken into account when managing the green structure? Our conclusion is as follows:

1. Conceptual approaches is important, and should be used purposefully to decide which knowledge base should be used.
2. The scientific knowledge base is inadequate and not suitable as a basis for identifying the values and functions of multi-functional green structures.
3. There is a need for better cooperation and utilization of green expertise in municipal administrations.
4. The definition of the areas that should be included in the planning process must be adapted to ecosystem thinking.
5. There is a need to develop methodologies that can contribute to management of protected species / areas as well as the varied green structure humans are calling for.

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