Shaping Urban Landscapes within an Ecological Urbanism

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Both EU- and UN-treaties have recently been signed, aiming to stop the global decline in biodiversity. This is not the first time treaties have been signed, and maybe not the last time. Hopefully this time good intentions showcased on the global scene will materialize from policy to action-level. One of the problems is, however, that large scale nature-projects are costly, and area-planning in the classic nature-preservation planning often is in conflict with other area uses. At the same time a paradigm in urban-theory is gaining momentum - *landscape urbanism* - and more recently *ecological urbanism*. Within these urban '-isms', landscape architecture is seen as catalysts for urban development-processes, and as a framework for a multitude of urban programs.

As mentioned in the description for this conference-track, there

> *"...is a need for an enhanced understanding of the dynamics, sustainability impacts, and possible alternatives or management options towards the current development of limitless metropolitan landscapes."*

To relate to the topic, the more specific purpose of this paper is to search for potentials in landscape-based urbanism concepts by the combination of landscape- and urban planning. The perspective is to showcase the synergy that lies within this new urban-nature ecology framework, thus investigating how an increased biodiversity can lead to a larger degree of diversity of usage and of tactile & visual experiences within the architectural planning-realm. In short: How can we create attractive urban landscapes that improve biodiversity in the cross field between urban- and nature-planning?

Change in the Danish planning context

Danish cities constitute an ever growing network of fragmented urban structures. This is, to a high degree, caused by the growing mobility, that since the 1960's have had a defining influence on the shape of our citylandscapes. Ever growing overlapping commuters' catchment areas have creating a patchwork of intermediate zones, as non-intended spatial and functional 'blind-spots' between city- and landscapeplanning. All this has happened despite city-countryside dichotomy of the planning legislation.[1]

After the 2007 Danish municipal-reform, there was a major change at the institutional level and a reordering of the role of the mandatory planning-documents. Before 2007 there was a clear distinction between city-planning, conducted by the local municipalities, and landscape- & nature planning, the responsibility of the regions. After theThe reform made the regions

[1] §13(2) and §§ 35-36 in the Danish planning act (Danish Ministry of the Environment, 2009)

obsolete, and the local municipalities got 2-3 times larger. The municipality-level acts were extended to incorporate the regional-level landscape-/nature planning. This new integrated municipal-level planning is where things start to get interesting from an *ecological urbanism* point of view. In the pre-2007-situation, the local municipalities were held in check by the regions, and the city-land dichotomy was rooted in planning-document on different scales *as well as* institutions. After 2007 this conflict-system disappeared as the larger local municipalities are now expected to initiate a more integrated city-open-land planning.

So how to bring the two together. In this paper I cross two sets of understandings from two separate paradigms. The importance of shapes from an landscape ecological point of view and how ecology is percieved from an urbanism-architectural point of view.

From a landscape ecological point of view

Landscape Ecology as a science refers to the understanding of relations between landscape structures, human activity and their related ecologies[2]. One of the scholars within the paradigm, Richard Forman has identified *landscape ecology* as the field of relations between landscape elements, wildlife and human interventions (Forman, 1995). In his book *Land Mosaics,* he summarizes his review of a wide array of studies, by listing which overall properties has the largest impact on biodiversity. In order he lists 1) habitat diversity 2) (human) disturbances, 3) "landscape patch" interior size, 4) age, 5) differences between neighboring patches and 6) amount of isolation. This is merely one of the different parameters he highlights, but it functions as a useful starting ground for investigating the relation to specific *shape* and *the urban*, and as a beginning of understanding hierarchies in terms of cause and effect. More specifically on the *scale* dimension, Forman also addresses the relation between scale, biodiversity and classifications of biological organisms. Different studies have shown at what scale-levels, the 'cost-benefit' of landscape-element sizes is at its best. The one mentioned here relates to the different biodiversities based on different patch sized. Figure 2 shows, for instance, that in order to gain a high biodiversity for insect-eating birds you need significantly more space than you need for the seed-eating birds. (Forman, 1995, p. 60)

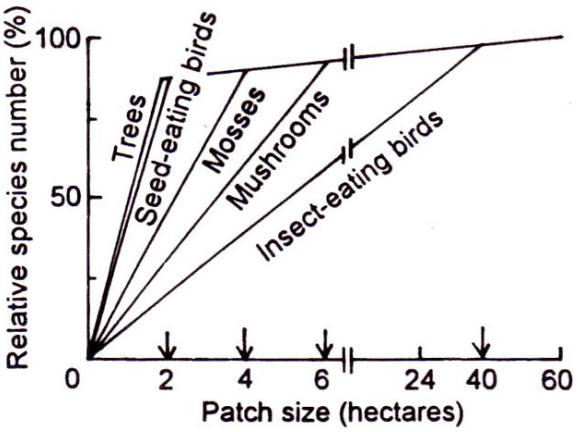

Figure 1 - biodiversities' dependencies on size

An earlier Danish meta-study made in 1982 by a research-group at the University of Roskilde, made a list of generic "all-other-things-being-equal" recommendations, of how the changing of different landscape structures can alter the biodiversity of these structures. (fig. 1, Biotopgruppen, 1982, p. 26) These two examples

[2] Ecology is in here defined as the study of interactions between organisms and their environment

should only be seen as tiny example of the field of landscape ecology, but even though these rules-of-thumb from both Forman and Biotopgruppen *are* quite generic, from an architect-planners point of view, they have an appeal,

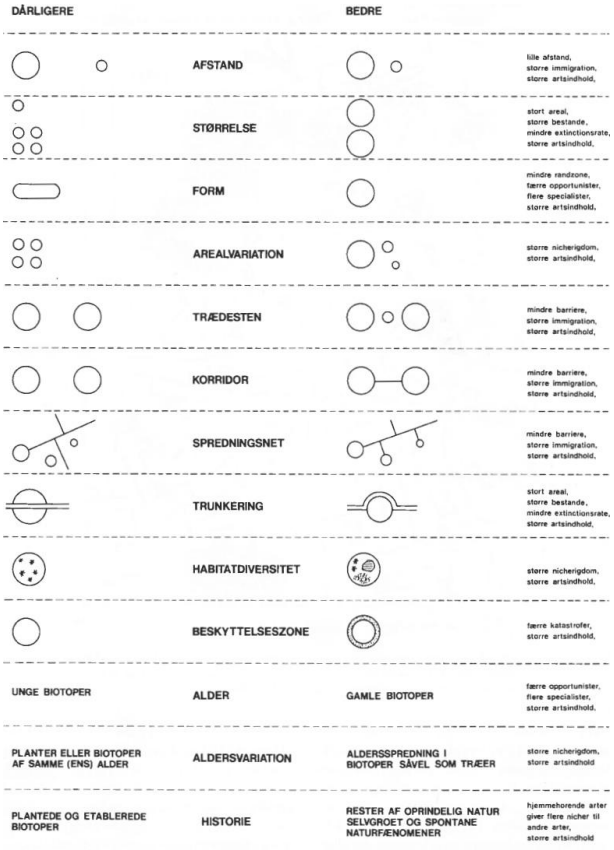

Figure 2 - Catalogue of spatial parameters

given their concise spatial expressions and recommendations. The relevance of these spatial recommendations should, from an architect's point of view seems very obvious to remedy the agenda of biodiversity in the role of designing the urban.

A more quantitative approach to evaluate the interactions between man and environment, lies in the realm of simulating ecology. Ever more powerful computers gives the possibility of combining knowledge of animals and their relations to different habitats, with a GIS model, that, in years, can become more and more detailed. Within the simulation, the movement of these virtual agents can be traced. This is often used to evaluate farm-planning, crop-rotation etc. Different landscape-structures form the base for flora- and faunamovements thus potentially giving way for testing of different scenarios. Since the approach is based on standard GIS-data, it is, in princple, open for a wider use including urban planning.

Ecology from an *urbanism* point-of-view

One of the key figures in viewing urban settlement and ecological flows as a whole is American landscape and city-planner Ian McHarg (1967). To McHarg the urban and the environment are closely knit, and only by overlapping the two through mapping, can a more appropriate land-use planning emerge. This total-view on the landscape can also be seen in newer approaches like the German *zwischenstadt*-concept first coined by architect and urban planner Thomas Sieverts (2003). To Sieverts, the *overlapping* of spatial and functional features are a key issue, in a context where individual mobility has made the city-countryside dichotomy irrelevant.

This total-view on the urban landscape is to a high degree also shared by American landscape architect Anne Whiston Spirn (1996). In her article on Frederich Olmsteds practice, she argues, that a landscape is never truly *artificial* or *natural*. On the contrary, she views this distinction as counterproductive:

> *"Seeing humans, ourselves, as solely or mainly a contaminating influence prevents us from appreciating the potential beneficial effects we*

might have, and limits what we can imagine as possible" (Spirn, 1996, p. 111)

the opposite standpoint might be just as valid, and most likely more prodictive, and maybe even more sustainable

A paradigm in urban-theory, that tries to encompass both the total view on the urban landscape inherited by McHarg parallel to Sieverts, and investigating the potentials of human interaction with its surroundings has since the late 90s emerged - the so-called *landscape urbanism.* The term was coined by landscape architects James Corner and Charles who are the main proponents for applying a 'landscape view' on the development of urban areas.

In the last couple of years, a new *'-ism'* has emerged from landscape urbanism - *ecological urbanism.* Its origin was a conference at Harvard in 2010 of the same name. The massive publication following it, gathers the many papers, including the one by before mentioned Charles Waldheim. On the potentials of a new urbanism, Waldheim as well as Rem Koolhaas, emphasized the need of adapting *landscape urbanism* into a paradigm that to a higher degree can relate to ecological and socioeconomic condition (Waldheim, 2010b & Koolhaas, 2010) a view Waldheim further explains in an article in Topos, where he sees the ecological and environmental turn as a result of a midlife-crisis of the paradigm of landscape ecology, hinting also that a more operative approach is needed (Waldheim, 2010c,)

Synthesis of the two paradigms

Landscape urbanism, as coined by Waldheim and especially Corner can be difficult to grasp in the emphasis on open-endedness and processual development. Theorists like Spirn, Sieverts all the way back to McHarg share the view of the *total-landscape*, an urban landscape that encomapasses the territory in its entirety. This is the necessary first step of integrating urban- and nature planning - viewing the landscape in its entirety as potential for positive human influence, and not just negative.

The next step lies in the discussion of the processual and the spatial respectively. One of landscape urbanisms key selling points, is an emphasis on the processual, be it natural flows or discussions of infrastructures. This focus stems from landscape urbanisms' origin in landscape ecology. (Shane, 2003) Common for the two is their methodological framework, an emphasis on directing a process rather than drafting the master plan. This does, however, not change the fact however, that things still have to be built, forested, planted, irrigated or transformed, and has a geospatial reality. This spatial dimension is just as crucial as the processual. To remedy this 'need for the spatial', other parts of landscape ecology are useful. First of all, the countless ecological design guidelines, that *do* come out of this paradigm should be translated into something useful in an architectural planning realm.

Understanding how Formans' hierachy and scale figure as well as Biotopgruppens "rules-of-thumb" can be used as specific design guidelines is a natural step when researching how

city-planning can remedy a sluggish effort on improving biodiversity. The *site* will then be determining which relevant tools can be used on which scale it is relevant.

Sketch of a possible development-process

The *site* can in an architectural discourse imply a multitude of different spatial and cultural parameters, but in order to 'build with and for the green', the *site* also has to encompass the ecological context of the site, ie. soil-type, draining, mosaic-structure etc.

Many of the before mentioned rules-of-thumb are for the all-other-things-being-equal situations, and as with every other things in the world; no two things are equal. The discussion is instead, what tools are to be used at what point in the development process. Fundamental principles and rules-of-thumb should be a part of education ad planners, be it landscape- og city-planners. It should also be part of the development process in a conceptual scale. Hierarchies, scales and generic shapes can give valuable input to the layout at the overall scale alongside rudimentary knowledge of nature types on-site and at-site. Moving downwards in the scale-levels, and on-wards in the develop-phases, the ability to *test* the proposed landscape structures becomes more valuable, and this is where the simulations come into the picture. Whether the different development-scenarios are sketched by hand, on CAD-systems, or directly into a GIS, testing different structures are fairly easy to do, and the outcome is on a graphic- as well as on a quantitative level. The simulation should not be defining for the architects project, but should be used in the same way a topological optimization, and wind- tunnel simulations can be used to optimize and inspire,but not *define* structures and building units.

Implementation

Working proactively within an ecological planning, does however also highlight the need for collaboration between nature-planner and city-planner. Classic demarcation between the two often coincides with the city border. If the city, and thus the initiative and private capital that follows city-development, is to help remedy the underlying challenge of enhancing biodiversity, then this demarcation-line needs be blurred out alongside the blurring of the *functional* city-border as Sieverts already stated. City-planners need to be 'upgraded' with a sensitivity to ecological flows, and nature-planners must also be given the *keys to the city*. As an extension of Spirns stance, one could sat that if city-planners know nothing of the ecologies site they are planning for, then they end up passing up on an obvious synergy effect, as well as spending money on technical fixes they maybe could have avoided. On the other hand, if nature-planners only see the city as evil, they miss they opportunity of creating new hybrid natures, as well as connecting existing nature-areas with these hybrids.

So *how* can this be implemented? The key objective in order to implement an integrated planning & development as outlined above, starts at one place - the municipalities. It is however also crucial to make the municipalities aware of the potentials that lie within the new planning. I have no doubt that they want to

search for a smarter way to do planning, as the current planning system inherited from pre-2007 system has shown to be increasingly heavy on man-hours and scarce on innovation. Landscape-/ Ecological urbanists can showcase thousands of interesting and groundbreaking projects, as they should, but without the backing from the municipalities and the interest in transferring knowledge from academia to practice, this will take much longer than necessary.

This, I believe, is key to understanding how ecological urbanism can influence planning. In my view, urban planning has been disconnected from the design level, but reconnecting the two by highlighting the specific properties of the project, and by distilling their planning-content, urban planning can re-focus its spatial policies from an on-the-ground perspective that is so essential for planning to become relevant for the end-user and for the environment.

Conclusion

The growth of the city without limits and its metropolitan landscapes challenges sustainable development. A high level of interdependency and mobility encourages dispersed urban development patterns just as dispersed urban development calls for a high degree of mobility based on car transport. The increased urbanization of the landscape come at the expense of productive agricultural land and increases the pressure on attractive - but vulnerable - landscapes.

The spreading of housing for the urban population raises demands for increased services in towns and rural districts. There is a need for an enhanced understanding of the dynamics, sustainability impacts, and possible alternatives or management options towards the current development of limitless metropolitan landscapes.

Papers are invited on the consequences of the city without limits and its metropolitan landscapes for land use, flow of resources or wider sustainability impacts related to the development of the urban region; as well as on innovative strategies for sustainable metropolitan development.

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