

Back to nature



a landscape study to increase social benefits of new nature areas
in Dutch peat meadow landscapes

Martijn Franssen & Stijn Heukels

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new nature areas in Dutch peat meadow landscapes

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Samenvatting

Het voorliggende onderzoek heeft als hoofddoel het bijdragen aan een landschappelijke benadering voor natuurontwikkeling. Dit kan leiden tot een groter maatschappelijk rendement dan de benadering die ten grondslag ligt aan het huidige natuurbeleid. Na conceptuele onderbouwing van het beperkte maatschappelijk rendement van de huidige natuurbenadering, richt het onderzoek zich op de vraag hoe dat met een landschappelijke benadering beter kan. Gebaseerd op wetenschappelijke kritiek op de huidige benadering en een verkenning van de hedendaagse betekenis van natuur in de maatschappij, wordt in het vervolg van het onderzoek een groter maatschappelijk rendement van natuur gezocht in een versterking van de interactie van verschillende waarden van natuur. Er is hierbij een indeling gemaakt in ecologische, cultuurlandschappelijke en recreatieve waarden.

De zoektocht naar een concrete landschappelijke benadering begint bij het methodologisch kader. Landschap wordt hierin gezien als de som van natuurlijke en antropogene vormen, processen en organiserende krachten. Vanuit een literatuurstudie naar de betekenis van natuur in de maatschappij, wordt het methodologisch kader vertaald in een landschapsfilosofie voor het ontwerp van natuur. Deze gaat uit van de gedachte dat natuur in verschillende gedaanten overal aanwezig is. Dit relateert de grenzen van functioneel begrensde natuurgebieden. Natuur is ook in de ruimte daartussen: de matrix. De natuuropgave ligt daarom niet alleen in het vergroten van het oppervlak natuurgebied, maar net zo goed in het versterken van de natuurlijke kwaliteit van de matrix. Daardoor kan de ecologische verbondenheid worden versterkt, kan de identiteit

van het cultuurlandschap worden vergroot en neemt de recreatieve waarde van het landschap toe.

Het huidige beleid voorziet in grote investeringen in de realisatie van een ecologisch netwerk. Naast de juridische component van dit beleid, is het ook sterk verankerd in een ruimtelijk concept. Een belangrijke schakel daarin is de robuuste moerasverbinding door het Groene Hart van Holland en Utrecht. De verschillende rollen van natuur zijn voor deze moerasverbinding in vier casussen onderzocht. Analyse en vergelijking leren dat de ligging van het ecologisch netwerk ten opzichte van bebouwingslinten bepaalt hoe de interactie tussen de verschillende rollen van natuur is. Daarnaast blijkt de interactie afhankelijk van de manier waarop de planvorming in het gebied is georganiseerd. In integrale planprocessen is er een grotere kans op interactie tussen rollen van natuur.

De vergelijking van een casus in de droogmakerijen met de casussen in het veenweidegebied laat zien dat de interactie tussen rollen van natuur verschillend van aard is in verschillende landschappen. Juist een benadering geënt op het landschap zou daarom anders moeten zijn, afhankelijk van de context.

Gebaseerd op de resultaten van het casuonderzoek is vanuit de landschapsfilosofie een landschappelijke benadering voor de locatiekeuze en het gebruik van natuur in het veenweidegebied ontwikkeld. Gezien door de bril van de landschappelijke benadering is het veenweidegebied te karakteriseren als een afwisseling van bebouwingslinten en weiden.

Daarop anticiperend zou het ecologisch netwerk voor het

veenweidegebied ingevuld moeten worden als een afwisseling van kerngebieden en *local patchworks*.

Local patchworks dragen bij aan het maatschappelijk rendement van natuur door een sterke interactie tussen rollen van natuur. Het gebruik van het *local patchwork* wordt gereguleerd door netwerken van wegen en waterlopen. In plaats van functionele scheiding, neemt de benadering daarmee intensiteit van en hiërarchie in gebruik als organisatieprincipe.

Het *local patchwork* principe is toegepast voor de zone tussen Woerden en Bodegraven. Moerasstroken, achterkades, riet oevers, ontwikkeling van boerenerven en het in ere herstellen van de Oude Hollandse waterlinie vormen samen met een aangepast netwerk de basis van een *local patchwork*. Daarbij worden verschillende strategieën gebruikt voor de ontwikkeling van natuur. De sturingsfilosofie speelt in op lokaliteiten door integratie voor te staan, flexibiliteit te bieden en de oplossing te zoeken een gebiedgerichte aanpak. Een ontwerpschets en detailuitwerkingen laten zien hoe het *local patchwork* eruit kan zien en welke mogelijkheden er zijn tot interactie tussen verschillende rollen van natuur op een lokaal niveau.

Een landschappelijke benadering vergroot het maatschappelijk rendement van natuur, maar vraagt voor verschillende landschappen om andere oplossingen. De ruimteclaim van natuur wordt groter in het *local patchwork*, maar verenigt ook meer doelstellingen. Daarmee is de benadering niet alleen financieel gunstig, maar is ook de maatschappelijke betrokkenheid bij natuurbescherming en de legitimiteit van het beleid gewaarborgd.

Summary

The main goal of this landscape study is to develop a landscape approach which contributes to social benefits of nature. We formulated this goal because we found out during a first exploration of the current nature approach, that the current nature approach had limited social benefits. Therefore, the study focuses on how this can be improved by a landscape approach. Based on scientific critique on the current approach and exploration of the present meaning of nature in society, we aim at increasing social benefits of nature by strengthening interactions between different values of nature. Therefore, a distinction between ecological, cultural landscape and recreational values was made.

The search for a practical landscape approach started at the methodological framework. Landscape is seen here as a sum of natural and artificial aesthetics, processes and organisational forces. Literature review on the meaning of nature for society was used to apply the methodological framework in a landscape philosophy. This philosophy is based on the notion that nature appears to be different in every situation and context. Correspondingly, the boundaries of functional bounded nature areas become relative. Nature is in the in-between areas as well: the matrix. Nature objectives therefore should not only focus on increasing the surface of nature reserves, but also on strengthening the quality of nature in the matrix areas. As a result, ecological connectivity is increased; identity of the cultural landscape is strengthened, and recreational values of the landscape are growing.

Large investments are related to current nature policies, concerning the construction of the ecological network. Apart from the legal component of these policies, it relies on a spatial concept as well. An important link in the network is the robust Wetland Corridor which crosses the Green Heart of Holland and Utrecht. Different roles of nature in this Wetland Corridor have been explored by four case studies.

Analysis and comparison reveal that the interaction between different roles of nature is determined by the position of the ecological network in the midst of occupation strips. Moreover, this interaction depends on planning styles as well. Integral and regional planning processes positively contribute to the realisation of opportunities for interaction.

Comparison of cases in the peat meadow landscape and a reclaimed lake points out that interaction between roles of nature has different characteristics in different landscapes. Therefore a landscape approach differs in separate contexts.

Based on the results of case studies, the next step was to convert the landscape philosophy into a landscape approach for arrangement and use of nature in the peat meadow landscape. From a landscape perspective, the peat meadow landscape is characterised by an alternation of meadows and occupation strips. To anticipate on this observation, ecological networks should consist of key areas and local patchworks.

Local patchworks contribute to social benefits of nature by strengthening the interactions between different roles of nature. Networks of roads and watercourses reg-

ulate the use of the local patchwork. Therefore the approach is based on intensity and hierarchy of use in stead of functional zoning.

In order to test the local patchwork principle, this approach is projected in the area of Woerden and Bodegraven. An adapted network has been developed based on the local patchwork principles. This natural network consists of swampland strips, backside dikes, reed shores, development of farmyards and the restoration of the Old Dutch waterline of defence. Different strategies have been used for the development of nature. The utilization of local initiatives and opportunities are the basics of the planning philosophy, which stands for integration of land use, flexibility and regional approaches. A proposal for final arrangement and detailed designs show possible appearances of the local patchwork and opportunities for interaction between different roles of nature on a local scale.

A landscape approach increases social benefits of nature, but asks for different solutions in differing landscapes. The local patchwork causes larger spatial claims, but also combines different purposes. By doing this, the landscape approach has financial advantages, but also guarantees the social involvement with nature and the legitimacy of nature policies.

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Preface

We both come from the countryside, and during our childhood we used to play in nature. *Nature* was everything outside that aroused our interest. Like exploring the fields, climbing trees, and catching frog's eggs and put them in a little pot. In summer, we used to hide ourselves in the meadows or corn fields, and of course the farmer was not very happy about it. In winter, we used to ice skate on the ditch at the back side of the house. Who was the first one who dared to stand on the frozen water, and who was the first one who fell through it?

Right now, many years later, we are still interested in nature. But having gained more knowledge, it doesn't get any easier to understand all of it. What is nature nowadays and what does it mean to people? It is often said that we are the last generation that is brought up without computers. As children we spend our time outside, exploring nature, but many children nowadays are far away from it. Do little boys still know how a cow looks like or where the milk they drink comes from? Although computers might be one of the reasons that people distance themselves from nature, we don't think it's all due to technology. Another reason is found in a growing distance between accessible *green areas* and people's living environment.

Not only we are the last generation that grows up without computers; we are also the first generation that grows up with *new nature*. It may sound like a paradox, but how is it possible that due to new nature, there is more nature for children to play in, but they can't reach it as the distance between people and nature is growing?

As students spatial planning and landscape architecture, we are caught by a very broad meaning of nature. However, the nature we know from our childhood is not exactly the kind of nature where experts on nature talk about nowadays. There appear to be several interpretations of nature, of which only one is adopted by the development of new nature areas. This phenomenon took our interest. Why are new nature areas so many times inaccessible for people? Why can't new nature areas help to bring the green to the people?

In this study, we asked ourselves the question: What really is the meaning of nature in today's society and how can we relate this meaning to new nature areas that are made?

It was a turbulent year. We started in February. Although Stijn was still finishing his internship and Martijn was working on his last compulsory course, we made a quick start. Soon however, we got confused of all bureaucracy that it takes to do an interdisciplinary thesis project of Landscape Architecture and Spatial Planning.

Although both chair groups are closely related on a theoretical level, taking part in an interdisciplinary thesis project is not very common, and we found out why. It started with the paperwork. Filling out thesis contracts appeared to be problematic, since both chair groups have their own system. Who are going to supervise us, how many of them are needed, and what are procedures concerning evaluation and final marking? It took quite some time to take this barrier. Isn't there really any way to make this easier for future students who want to broaden their horizon?

In March and April, work progressed steadily. During this time, we still worked on the Hucht building. But it was not for long. Within a short period of time, all people had to move to the new campus of the university. The Hucht building was sold.

It was not possible any more to assign for a thesis room at the Hucht, but for those last few months we managed by taking a practical room as temporary work space. Gradually, more people moved out and we witnessed the decline of the Hucht, the domain of many generations of spatial planners, landscape architects and socio-spatial analysts.

In May, we made a new start in two ways. Not only had we settled at our new spot at the Gaia building, we also had begun assisting Ingrid Duchhart in teaching a course on research methods. Until summer break, we worked part-time on our thesis and part time on teaching research methods. It couldn't be better from a research point of view. The things we were teaching in mornings were used for our own study in the afternoon. From a time management point of view however, working together with Ingrid in practice meant problems with our thesis planning and many stressful situations.

Apart from teaching activities, our move to the Gaia building meant being packed with eight students in a room that really is too small. There were computers available so we could make a start, but some internet connections were still missing. After some time, we got problems with computer maintenance. Also, sketching tables were missing. How is it possible to unroll a map without having a proper table?

These many side effects didn't really stimulate our thesis

work. Our time schedule appeared to be too tight and we didn't reach our summer deadline. Also our combined theoretical and practical approach appeared to be nice in theory, but hard to manage in practice. All time, we were balancing and dividing our time, which made us rather unsatisfied with results.

After a six week summer break we made a fresh start in August. Already before the break, we nearly finished the theoretical part so we could fully focus on the practical part. Case studies that started before summer break had to be finished. Field trips were made and after another six weeks of wrestling on the focus of our study, the month October was deciding. All of a sudden, things became clear and we could finish the project. Looking back, it seems that many months ago we knew how the final result would be. Already in May, when we kind of concluded on our design philosophy, Stijn said that "from now on it's only a matter of bringing the project to an end". Though we had some hard times in the following months, partly due to our ambition to do the job with great precision, the last month showed that he was right on that. The ideas were in our minds, the only thing we had to do was to put it on paper. The latter seems easy but in the end still took us about six weeks.

Now we are finished, we can say we did a hell of a job. Our study provided in a lot of new insights on the planning and design of new nature areas. Initially, we believed that especially landscape architects should not get involved with the design of nature areas. Afterwards however, we can state that there is a great difference be-

tween arrangement and design of nature. Especially on a regional scale level, the arrangement of new nature areas is essential to make new nature areas more valuable for people. The next step, how nature is designed, is also important but often a direct consequence of arrangement.

It would be great if new insights that are acquired by this study are going to be used now and then. The study might be an eye opener for policy makers, landscape architects, planners and ecologists. Also important is that the study might be helpful to close the gaps between different groups of people. Not only between ecologists and landscape planners, but also between the chair groups of Spatial Planning and Landscape Architecture. By doing an interdisciplinary thesis in landscape architecture and spatial planning, we would like to show the value of cooperation. We hope his study will be used as an example to stimulate students and staff members of both chair groups to work together.

Fortunately, despite all negative side effect of cooperation, we were assisted by cross-border thinking tutors! We would like to thank our supervisors Rudi van Etteger and Jan van Nieuwenhuize for their involvement and enthusiasm. Rudi's knowledge about policies and nature conservation was very valuable. Jan's childhood experiences in the area of *Zaanstreek* inspired us during the design of a sustainable organization of the landscape of Oude Rijn. We also thank Raoul Beunen and Ingrid Duchhart for their supervising. Raoul had an important role in finding the focus of the study; what is really the

problem we are addressing?, Ingrid stimulated to critically reflect on research methods by her course on Advanced Design Research Methods.

Our interviews and discussions with Jeanet Bok, Klaas Kerkstra, Eveliene Steingröver, Joost Wattel, Albin Hunia and Janneke Govers provided necessary insights. We are very grateful to them as well. Finally we would like to thank Dieuwertje Lont and Jan Heersche that we could use their cars.

Martijn Franssen

Stijn Heukels

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Introduction

1

increasing the social benefits of new nature

Many times, nature and landscape are two sides of the same coin and, especially in the Netherlands, they are determined by our cultural history. The same counts for the development of new nature. Opposed to farmers, who create nature and landscape by farming, the government and nature conservation organizations create nature and landscape by transforming agricultural land.

The concept of nature knows different and multiple interpretations. Nature can be both jungles, rough landscapes, agricultural scenes and city nature. Nature experience is personal, but there are some returning patterns in experience. We can discern, for example, views on nature determined by wilderness, interactive use of nature, and nature as a cultural experience (Woestenburg et al., 2003, Feddes et al., 1998).

This chapter introduces our research problem in different steps. Firstly, the meaning of nature in society is discussed. Secondly, the focus is on nature policies and how these deal with meanings of nature in society. The third paragraph considers our personal statement on design of nature and concludes with our thesis. In the fourth paragraph, the three previous paragraphs come together in a purpose statement and research questions. The last paragraph a reading guide explains the structure of the report.

Social context

Nature and landscape represent core cultural values in the Netherlands. Many people spend their leisure time exploring the outdoor environment. They search for peace and space to relax and recover from busy work. Especially during the last fifty years, people became concerned about the quality of their environment. Quality of life was not dependent on the availability of essentials anymore, but became associated with happiness, freedom of mind, culture and art, entertainment, aesthetics, and peace.

After the Second World War, first priority is to rebuild the country by focussing on economic progress. After prosperity increased, special concern about our outdoor living environment arose. One of the implications was the design of special leisure areas. Outdoor leisure becomes a common activity for people of all classes and inspired a renewed concern for nature and landscape. Care for the quality of the environment stretches beyond the protection of nature conservation areas.

Instigated by the report of the club of Rome in 1968, people become concerned with pollution and waste of

the environment. Aim is to both reduce and control these issues and to take care of the sustainability of ecological systems and processes. Flora and fauna are seen in relation to habitat fragmentation. Ecological networks are important measures to guarantee biodiversity goals set by national nature conservation policies.

Besides sustainability issues, also intrinsic values of nature (recreation) surpass cultivation values like agricultural mass production. Society also becomes concerned with cultural values of the environment, which is reflected in a rising attention for history and identity of landscapes and regions. Old waterlines of defences, monuments and even complete polders are protected by new national and international policies. Moreover, policies appoint *national landscapes* in which conservation and development of aesthetical landscape characteristics is main priority.

At the end of the twentieth century, issues on nature and landscape are split up in separate policies. On the one hand, there exist policies that focus on nature conservation in terms of biodiversity. On the other hand, there exist policies that focus on the cultural and recreational aspects of nature and landscape.

Problem exploration

Nature policies focus on ecological values and have limited attention for social and cultural aspects of nature. As a result, newly constructed nature areas based on the narrow purpose of nature policies do not take into account other nature and landscape issues. Moreover, aesthetical considerations concerning the beauty of existing landscapes are addressed only marginally. Especially cultural values represented in the old cultural landscapes are in danger, while these landscapes also refer to changed social values.

1. National policies distinguish separate values of nature for separate landscapes

Spatial policies of the Dutch national government distinguish different values of nature. Historical values of nature and landscape experience are the focus of 'landscape' policies, recreational values of nature are the aim of policies on 'nature for people', and biodiversity objec-

tives are the foundations of 'nature' policies.

Due to separated policies, the government creates a spatial distinction of separated values of nature for separated landscapes. A spatial distinction is strengthened by the implementation of different spatial concepts, operating without being geared to one another. In other words, policy makers pay little attention to the spatial integration of different values of nature on a national level.

The separation strategy has the advantage of one favorable design which suits best for the intended use.

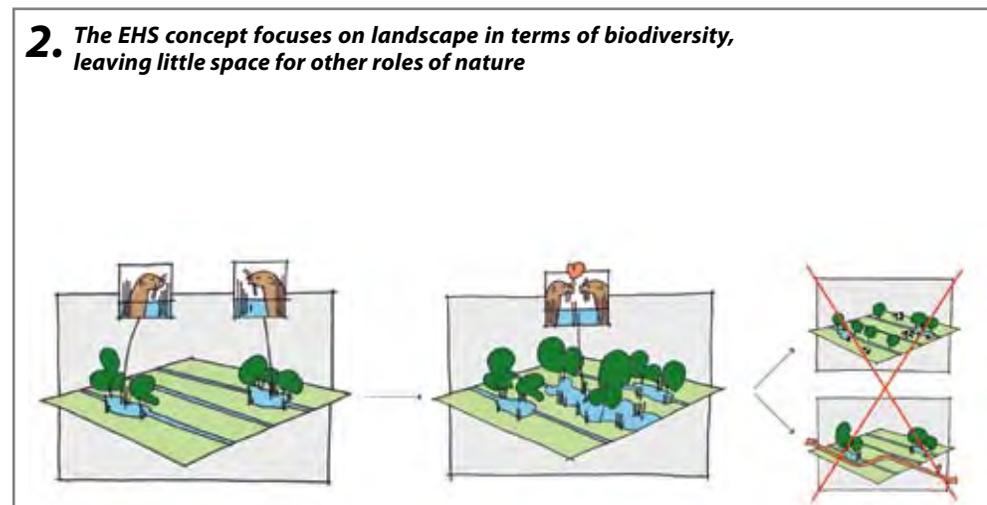
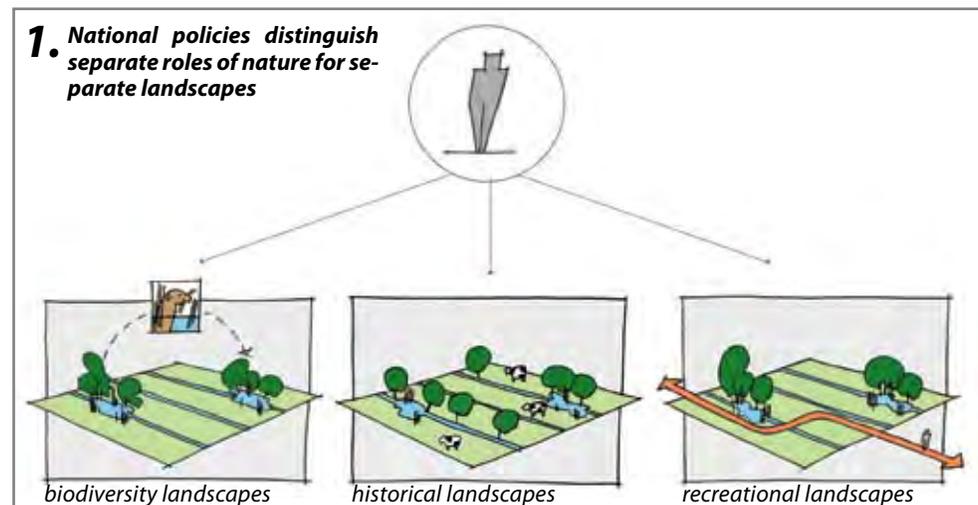
2. The EHS concept focuses on landscape in terms of biodiversity, leaving little space for other values of nature

Central strategy in nature policies is the ecological network concept, which is articulated by the 'Ecologische Hoofdstructuur' (EHS). This concept connects different nature reserves to each other by ecological corridors and nature development areas (Ministerie van Landbouw et

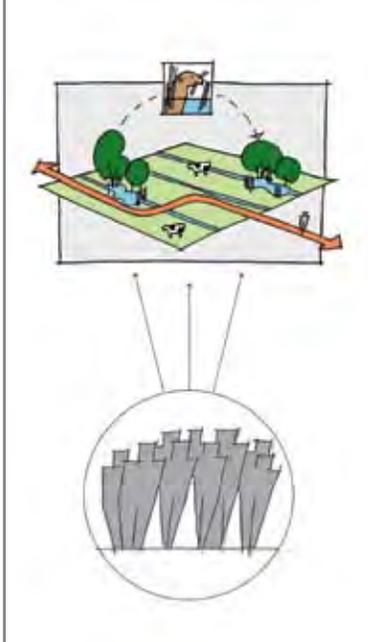
al., 1990). Robust ecological corridors have been added to the concept in 2000 in order to increase the effect of the network (Ministerie van Landbouw, 2000). The EHS is a policy strategy, a spatial concept and a legal directive together. Changing one of them, often influences other aspects of the EHS.

The experience of landscape and the recreational and cultural values only have a limited role in the EHS. Recreational activities cause disturbances of especially fauna and are correspondingly disadvantageous for biodiversity goals. To avoid disturbance, accessibility is often limited and recreational facilities are located in the peripheral zones of nature reserves. EHS nature is not primarily meant to be recreational nature.

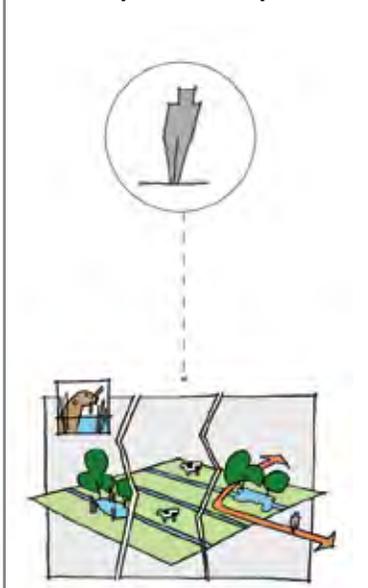
Most times, cultural values of the EHS landscapes are no threat for biodiversity. Often, the cultural history of existing and new nature areas is still visible and often maintained. Still, cultural values are in jeopardy for two reasons. Firstly, wilderness design of new nature areas often conflicts with the cultural historical lay-out of landscapes.



3. Society sees many roles of nature in only ONE landscape



4. Governmental policies intend to meet views of society. However, policies and spatial concepts remain separated



Secondly, cultural landscapes are originally multifunctionally used, while a single nature function is more profitable for biodiversity conservation (Renes, 2006).

3. Society sees many values of nature in only ONE landscape

Policy debate

“The EHS needs revision” is the theme of a special by the Dutch magazine ‘Landwerk’, a periodical about the construction of rural areas. The first page shows an advertisement by *Natuurmonumenten* (the largest Dutch private nature conservation association with almost one million members). The association supports this edition because of the need for a broader and more social approach to nature. Moreover, *Natuurmonumenten* considers a more integral spatial approach necessary (Van Duinhoven, 2006).

The association proposes three assignments for nature conservation: (1) to reconnect the relationship between people and nature by increasing their involvement with nature and nature policies, (2) to construct a cohesive green network of robust nature, and (3) to integrate policies in which nature is a collective resource and a responsibility of the government.

These ideas of *Natuurmonumenten* are illustrative examples of the scientific debate on a broader interpretation of the EHS concept. Cultural historians criticize the design of the ecological network, as a wilderness layout threatens cultural values of the landscape. More-

over, they consider the separation of nature from other land use (especially agriculture) to be harmful for the cultural landscape, which gives space to intensive agriculture, while in contrast the small-scale agriculture is favorable for the quality of the cultural landscape. Therefore, nature policies should be broadened into integrated nature and landscape policy (Renes, 2006, Dirkmaat, 2006).

Also ecologists acknowledge the narrow base of the EHS policy. Although most of them consider the ecological network policy to be successful, they think nature in general comprises more than only ecological networks. Especially the value of nature for people is underexposed by the concept (Opdam, 2006). Moreover, although many ecologists still believe that fragmented nature is negative by definition, some others think that fragmented nature creates possibilities for mosaic landscapes, in which agriculture and nature are integrated and supported by recreation and tourism (Vos and Hazeleger, 2005).

Landscape architects never supported the sectoral character of the EHS. The separation strategy of nature and other land use, which was invented by landscape architects in the eighties of the twentieth century, was originally intended as a multifunctional approach. The proposed landscape casco combined water networks, nature and landscape. The separation of nature and landscape policies was a disappointment for many of them (Kerckstra, 1991), especially because of the limited success of new landscape policies that should form the counterpart of nature policies. Although policies for cultural landscapes resulted in renewed attention for landscape, this

interpretation turned out to be more historical than aesthetic. In the book 'Oorden van Onthouding' published in 1998, some prominent landscape architects state "The EHS has a small scientific base, a limited design repertoire, a small political-substantive base and a limited democratic base" (Feddes et al., 1998).

Partly, these critics have been heard. Planner Raoul Beunen thinks that although the scope of the EHS is theoretically limited, in practice biodiversity aims most times have been combined with the value of nature for people. Also cultural historian Hans Renes acknowledges that urgent problems have been overcome due to area specific approaches on the construction and maintenance of new nature areas. As a result, nature conservationists nowadays measure the contribution of the EHS for nature and landscape on site level (Vos and Hazeleger, 2005). Beunen also mentions that apart from nature policies, also management style of nature areas and practical stubbornness effect a sectoral implementation of the EHS.

From that, we can conclude that a narrow scope of the EHS is not limited to policies alone. On the other hand, policies do not encourage a broadened interpretation of nature, while especially the national government is believed to set criteria and create conditions by making policies on nature.

Legitimacy and social support for nature policies

For the greater part, society does not make high demands on nature. According to a study on requirements

on nature by 'Team Vier' by order of the Dutch national newspaper 'Volkskrant', for most people a forest on cycling distance is just enough (Trommelen, 2004). Current nature policies, which focus on diverse landscapes and nature, do not link up with this requirement. What can we learn from these signals? Should we stop conserving nature and focus on planting forests on cycling distance? Only a limited part of the Dutch seems to have problems with this decision.

According to the study done by 'Volkskrant', legitimacy of policies is related to social support. In politics, the opinion of a majority of people has much influence. However, traditionally policies are considered to be legitimate if only a majority of the parliament supports them. Concerning this line of reason, policies are legitimate by definition. In this interpretation, legitimacy is understood as 'legal'.

Legitimacy as a measure for social support for policies is grounded in the meaning of legitimacy as 'just'. This interpretation is much broader than 'legal'; policies might be 'legal' without being 'just'. It is not clear when policies are exactly just. Beunen mentions that policies are not only just if there is a social majority in favor of a certain policy. "Many classical orchestras receive high subsidies while only a small group of people benefits. Nevertheless, legitimacy of these subsidies is not controversial because orchestras and classical music are considered to be cultural heritage." Many policies are only beneficial for a minority in society, but that does not necessarily limit their legitimacy. These considerations might count for nature policies as well.

Concerning the legitimacy of nature policies, we therefore have to do with the opinion of those people that are involved with nature (the concert visitors from the example of Beunen). The group of those who are indifferent to nature logically also have limited interest in the governmental approach of nature. However, this group is relatively small; almost everybody is involved with nature although their involvement differs widely. Some people prefer spending their leisure time in wilderness areas, others like the rural landscape or bungalow parks. Nature policies that are just meet the demands of all these people. However, making such policies is supposed to be impossible. On the other hand, concerning the diversity of nature involvement, today's narrow scope of nature policies is also not desirable. A green network as proposed by *Natuurmonumenten* respects social involvement with nature better anyway.

4. Governmental policies intend to meet views of society. However, policies and spatial concepts remain separated

Since 2000, governmental nature policies explicitly mention different roles of nature. The national policy plan for forests, nature and landscape '*Natuur voor mensen, mensen voor natuur*' relates the role of nature to people's use. The policy plan views nature as a resource for a livable and sustainable society. According to the government, their broad definition of nature corresponds to the experience of most people. According to the government, the difference between nature, biodiversity, forest and landscape is relative (Ministerie van Landbouw,

2000). Landscape experience, ecological diversity and sustainable use of resources become the three motives for the new nature policies.

Despite a broad definition of nature in the policy plan, the embedding of this definition in the existing ecological network concept is limited. In 2004, the policy plan was spatially implemented in the National Spatial Strategy (Ministerie van Volkshuisvesting, 2004). Also this policy did not integrate different motives. Rather, the National Spatial Strategy encourages a separated development of different natures in *national landscapes*, ecological networks and recreational areas. Moreover, the responsibility for recreational areas, networks and activities was delegated to local and regional authorities. (An elaborate overview of nature and landscape policies is presented in chapter 3.)

Policies on nature and landscape are evaluated by the Dutch Environmental Assessment Agency (Milieu- en Natuurplanbureau). The agency distinguishes policies on nature, landscape and nature for people. Recently, the report concludes that Dutch people value nature in their direct living environment and are willing to contribute for this nature and even pay for it. Also they conclude that nature and environmental education contributes to a positive attitude towards nature by school children. Moreover, national parks with visitor centres reach more people than parks without visitor centres.

Concerning the development of ecological networks, the agency mentions that despite the surface of nature areas increases, biodiversity goals will not be reached after realization of the planned networks. Also availability and

accessibility of nature for people is insufficient, like for example recreational green areas in the neighborhood of residential areas.

Finally, the agency concludes that different land uses can strengthen instead of threaten each other by the application of an integral approach in spatial plans (Natuurplanbureau, 2007).

An exploration of people's involvement with nature and the scope of nature policies show that policies only fit limited with roles of nature in society. Despite a broad definition of nature in policies documents, policy concepts still have a narrow scope on nature, which pay little attention to interpretations of nature. In other words, separation of different roles of nature in different landscapes does not meet social expectations on nature.

Problem statement

Considering the fact that all nature is created in historical man-made landscapes, the desired implementation of social values of nature in the EHS-concept and the threatened position of nature in the metropolitan landscape, it is a problem that policies approach nature and landscape separately. This endangers to split the Dutch landscape in distinct natural, cultural and recreational areas. Resolving this separation is essential for the preservation of typical aesthetics and people's appreciation of the Dutch landscapes.

Personal statement

5. The design assignment focuses on integrating different roles of nature by approaching the EHS as a spatial concept

A separate approach of different roles of nature in both policies and spatial concepts threatens to split the Dutch landscape in separate recreational, cultural, and ecological areas. In some cases, a separation forms a good solution and can even be desirable. There are areas that should be preserved for their ecological qualities and refrained from further interventions. Think for example of existing large nature areas like parts of the dunes or inundated peat fields. However, most newly developed nature areas are constructed at locations where other roles of nature are of great influence. These are cultural landscapes and constructing new nature here means creating new forms of cultural landscapes. Since all landscapes in the Netherlands have been transformed for human benefit, new nature areas cannot be seen apart from earlier transformations. When planning and designing nature for ecological purposes, both social benefits and physical aesthetics of cultural landscapes should be taken into account.

We believe that a split and narrow interpretation of nature in governmental policies has to be changed into an integrated approach that meets different roles of nature. This can be done in two ways. One solution is to avoid policies with a conceptual separation of nature. This asks for integration of policy concepts for biodiversity, natural recreation and cultural landscapes, and is a rather drastic solution, asking for a complete revision of nature policies. A second possibility is to integrate different values of nature into existing spatial concepts.

This study is based on the second solution. The choice for the EHS as object of study is based on the importance and influence of the concept in contemporary society. Far most nature investments concern the realisation of the EHS. Aim of this study is to integrate different roles of nature in the spatial concept of the EHS policy program.

6. Integration is only possible when the MAIN objective changes from a biodiversity to a landscape approach

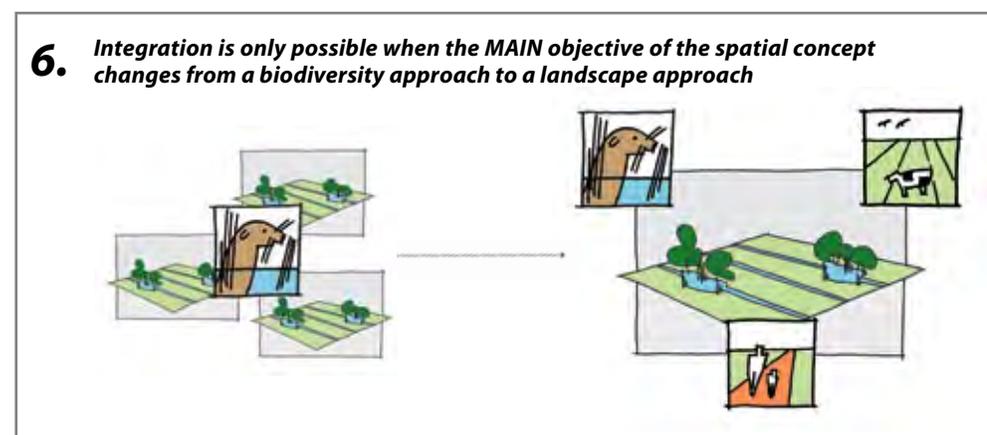
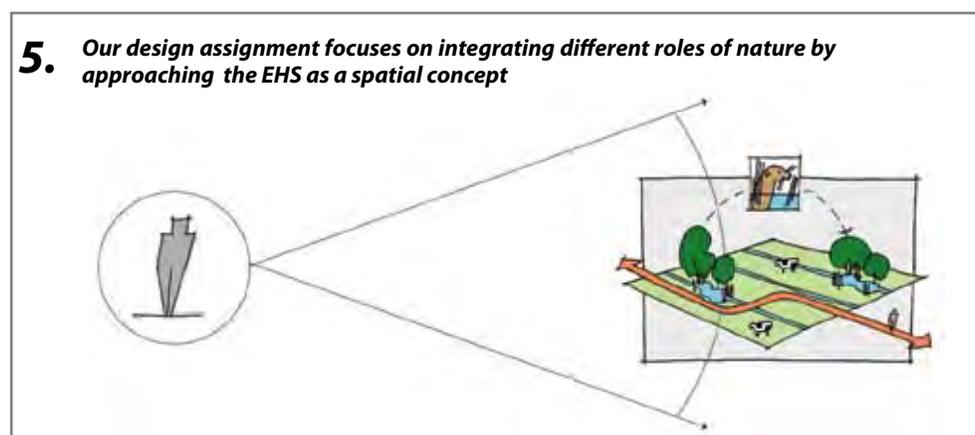
Location choice, visual appearance and accessibility of nature areas within the EHS are measured by biodiversity

goals. Criteria like fragmentation, level of disturbance and abiotic conditions for target species are of main importance. Only at the end of the line, criteria that meet other roles of nature are implemented.

In our understanding, the landscape unifies a wide range of values and interests, including roles of nature. Recreational and cultural roles of nature are not measured from a biodiversity perspective, but by other criteria. However, all roles of nature appear in one and the same environment, which in the Netherlands is formed by the cultural landscape. If different roles of nature should get an equal position in the EHS, not biodiversity but landscape should be the unifying concept. This asks for a reflection on design rules of the EHS, based on different roles of nature.

Thesis

A landscape approach to nature has a greater social benefit than a biodiversity approach because it takes into account the recreational use, the ecological value, and the cultural and historical experience of nature.



1.4 Purpose statement and questions

The problem statement mentions that it is a problem that policies approach nature and landscape separately. This sectoral strategy does not benefit from ecological, cultural and recreational values of non-ecological, non-cultural and non-recreational zoned areas. We stated that an integrated landscape approach to nature does solve this problem. We focus on nature policies and the ecological main structure (EHS). We study how different roles of nature can be equally implemented in the ecological network concept. This paragraph elaborates on how we will prove our thesis and perform our study.

The study aims to close the gap between ecologists and planners and designers and tries to come to a resilient landscape with (protected) nature areas as part of the living environment of people.

Main purpose

Main purpose of this study is to contribute to more social benefits of nature development in the EHS by the development of a landscape approach to nature, in which cultural, ecological, and recreational roles of nature are of equal importance.

Main question

How does a landscape approach contribute to an equal place for cultural, recreational, and ecological roles of nature in the EHS?

Sub questions

Inventory & Analysis

Which design philosophy based on landscape is in accordance with contemporary social meanings of nature?

- What are meanings of nature in society?
- What is the contribution of a landscape philosophy?
- What are essential elements of a landscape philosophy?

What does clarify social benefits of nature in current practice?

- What are the characteristics of the Wetland Corridor landscape?
- Which are roles of nature in the Wetland Corridor landscape?
- Which are interactions between different roles of nature in the Wetland Corridor landscape?

Synthesis

How does a design approach based on landscape increase the social benefits of nature, embedded in a sustainable spatial structure and organization?

- Which leads does landscape offer for a landscape approach to nature?
- How does a landscape approach contribute to a sustainable spatial structure and organization?
- How does a landscape approach contribute to interactions between different roles of nature?

What has to be done to realize nature in accordance with a landscape approach?

- Which (new) essential elements are necessary for nature based on a landscape approach?
- How should the use of nature be developed concerning a landscape approach?
- Which actions are needed to realize the appearance of nature that fits a landscape approach?

This study aims to increase the social benefits of nature. We believe that a landscape approach to nature has more social benefits than a biodiversity approach to nature (which is the focus of most nature policies). This study gives evidence for the greater social benefits of a landscape approach to nature. More specifically, this is investigated for three core meanings of nature: the recreational use, the cultural and the ecological value of nature.

Evidence is found in both theory and case study research. The possibilities for a landscape approach have been explored by comparison of planning concepts, the limited social benefits are exemplified by case studies, while the design illustrates how a landscape approach realizes more social benefits and gives insight in the consequences.

In general, the structure of the report follows an order which is based on three steps: exploring backgrounds (disciplinary background and subject background), considering theories (inventory and analysis about nature in general and the wetland corridor specifically) and a design approach (synthesis of practical analysis and application).

Chapter two elaborates on the (disciplinary) framework of the research and the design of the research.

Chapter three introduces nature conservation as an urban activity which started in the urbanising society of the last decennia of the 19th century. Moreover, the chapter relates this to the former and current nature policies.

Chapter four discusses the meaning of nature and concludes that a landscape perspective on nature is the right answer to contemporary meanings of nature. Moreover, possibilities to give a conceptual implementation to this perspective are explored.

Chapter five deals with the object of this study: the robust ecological connection 'Wetland Corridor' which should cross the Green Heart after realization of the EHS. The chapter discusses policies and landscape characteristics, which results in a choice of case study areas.

Chapter six contains the results of the case studies done in different areas the Wetland Corridor is crossing. The chapter is a practical exploration of the interaction between different roles of nature in the metropolitan landscape.

Chapter seven presents a design approach for the peat meadow landscape to create new nature areas.

Chapter eight shows a plan for the development of the Wetland Corridor in the area of Oude Rijn, between Woerden and Bodegraven. The chapter illustrates how the design principle of a local patchwork can be realized.

Chapter nine places the experiences of this research in perspective of the broader context of nature conservation and gives some recommendations for policies, design practice, and further research.



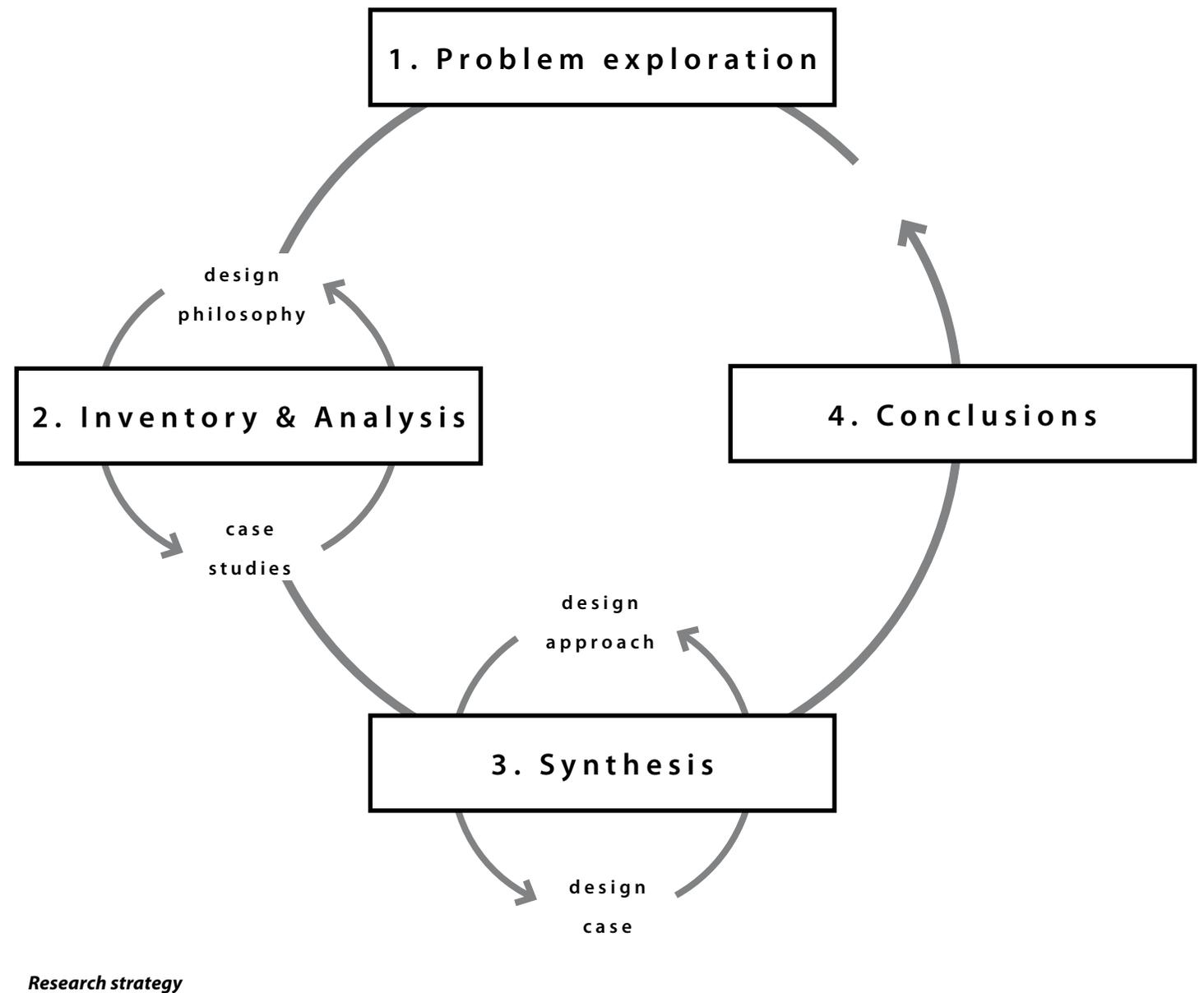


Research methods 2

A landscape study

Introduction

This study is the result of an interdisciplinary project. Both landscape architecture and spatial planning are involved. This affects the way the problem is approached and how the study has been done. Therefore, we discuss the methodological background and the interdisciplinary base in detail before explaining the methods. The first paragraph of this chapter introduces some methodological principles the study is based on. It summarizes the philosophical tradition in which the research should be placed. The second part of the chapter examines common grounds of landscape architecture and spatial planning by exploring landscape models and concepts. This results in a conceptual definition (a landscape approach) useful in this study. Finally, we come to business by an overview of specific methods used to gather data and bring on conclusions.



Methodological considerations

Methodology concerns theoretical notions on the study itself. By considering methodology we make explicit our starting notions. After an introduction of research characteristics the research strategy will be explained.

Research characteristics

The study can be characterised as *applied* research and uses a *pragmatist* perspective. This means the study is problem centered and oriented on practical solutions. Pragmatic research is not fixed to one approach, but uses everything that might be useful in understanding the problem. It takes into account different contexts in which the study occurs. Therefore, truth is based on what works and depends on these contexts. The methodology serves the research problem instead of being directive and being a straitjacket. If necessary, both qualitative and quantitative methods are used (Creswell, 2003).

The study is interdisciplinary spatial research, focussing on landscape architecture and planning. Both disciplines can contribute with specific skills and knowledge considering issues with spatial consequences. Spatial patterns and relations, aesthetics and land use are central to the study. We approach the problem from a landscape perspective, which is based on the understanding that all spatial elements are part of a multifunctional landscape. We intend to contribute to the existence of a valuable environment for people to live. Nature is considered as a condition for a living landscape. The research focuses on

a regional scale and tries to combine specific interests in an integral strategy for future nature development.

One specific area on a regional scale level will be central in the study. This case area is our source when applying the research questions and in preparation of data collection in other, case areas on a local scale level. Considering the problem statement, the choice of the regional case area has to reckon with a number of requirements:

- Planned new nature area within EHS
- Size of the study area: regional
- Located in the metropolitan landscape close to urbanized area
- Located in a cultural valuable landscape

Research strategy

Concurrent strategy

The *pragmatist perspective* is applied in a *concurrent strategy*. A concurrent strategy gives the opportunity to use both quantitative and qualitative methods, and can therefore be characterised as a mixed methods approach. Most important quality of the concurrent strategy is a simultaneous data gathering and implementation. In this study, the priority of quantitative and qualitative data is equally treated. On the other hand, qualitative data might be dominant because of the extent of qualitative methods. The integration of different types of data happens both in a data collection phase, and during analysis and interpretation of those data. By integration we guarantee sufficient *triangulation* in the methodology. Triangulation is checking data and using different perspec-

tives in order to make the results more liable. Triangulation is also of concern considering the validity of data sources.

Inductive focus

The study starts from a practical problem (see diagram 'research strategy' phase 1). Both theory and practical experiences guide inventory and analysis on the relation between nature and landscape (phase 2). Inventory and analysis are executed in different cases on a local scale level. Interpretation of the results takes place in the synthesis phase (3) and is done by three different analyses (see paragraph 2.3). They come together in an interpretation of the task for planning and designing nature and landscape and ultimately result in a design approach. This approach will be tested in design and planning practice. Finally, inventory, analysis, and synthesis results in conclusions and recommendations (phase 4).

The focus is on gaining knowledge from practice in an inductive way. According to Flyvbjerg the research strategy of planning research should be problem driven instead of method driven. Emphasis is therefore on investigation of cases and contexts (Flyvbjerg, 2004). This strategy is implemented by observation, reading and qualitative interviewing. Not only we question why, but also how processes go like they do. Especially qualitative interviewing gives the opportunity to ask for stories beyond outcomes and opinions.

Backtracking

The research strategy contains different moments for backtracking. Backtracking is the process of rethinking and repeating steps in order to improve and test the re-

sults and interpretations. This is done by a process of successively analyses, a syntheses and an evaluations (Van Buuren, 1997: 7). In analyses, suppositions can be derived out of the collected data. These suppositions are applied in syntheses and tested in evaluations. Finally, the evaluation offers new questions to be answered with new suppositions (see diagram 'backtracking'). These three steps of the process are important for every phase of the research strategy, but are of major importance in phase three in which the data are interpreted. Backtracking procedures are different in size; sometimes they imply a

reconsideration of one phase, sometimes more phases of the study are evaluated. The process is embedded in a normative context characterised by creative leaps, which is considered decisive for the outcome of the study. Between every step of analyzing, synthesizing and evaluating, normative elements take part in the process.

The intention of research by design in this way is more than objectively deriving probable or possible solutions. By including normative elements, the final intention of the study is to find desirable solutions.



Landscape in the Dutch context

Landscape approaches

Landscape is seen as common ground of landscape architecture and planning. Although they discuss the same object, both disciplines approach it differently. Landscape architecture can be characterised as an artistic discipline, while planning can be considered as policy science. Landscape architecture searches for design solutions, planning looks for answers from a more social context. Planning and landscape architecture many times see the same problems but propose different solutions.

This paragraph focuses on the common ground: landscape. How do approach landscape? Overlooking some communication barriers, where do we meet each other in researching landscape?

What is landscape?

Landscape is one of the most comprehensive and complex words in our language. Meanings that are given in different languages show that it is bound to cultural, societal and geographical differences. The origin of the exact phrase 'landscape' is found in the Dutch language. Their word 'landschap' comes from the word 'lantscap', in which 'lant' stands for land and 'scap' for the Dutch equivalent of ship, denoting a quality or condition.

Definitions of landscape

Definitions in dictionaries also do not give any clarity about it. The Dutch dictionary Van Dale (2007), defines landscape as "a rural area that can be overlooked in one view." According to Corboz, this conception is rooted in the classical contradiction between city and countryside,

which emerged during the industrial revolution (Vroom and Ettema, 2005: 195). The Oxford dictionary (2007) on the other hand gives a totally different explanation. They define landscape as "all the visible features of an area of land", comprising the soil, the hydrological situation, plant growing and humanly build constructions. In relation to this definition, physical geographers define landscape as the interrelatedness between different landscape factors, like rock, relief, climate, soil, water, air, flora, fauna and humans (Berendsen, 2000).

However, the complexity of the word's meaning is related to more than just interpretations of the physical reality. Behind the world we see around lies a system of norms, ideologies, and considerations about the practical benefit of the land. Dependent on different notions, aims and interests the landscape is defined differently. Landscape in painting implies a scene, whereas ecologists talk about ecosystems. This also explains why some people exchange the words landscape and nature, or why the city is seen as the landscape's counterpart. One can also talk about landscape in terms of city landscape, road landscape or even the landscape of the mind. The latter shows that for many people landscape is not only about how we see the environment itself, but also that it covers a range of mental issues, like identity, the atmosphere one can sense, and the feeling that you feel personally attached to the land. Environmental psychology is one of the disciplines that is concerned with these aspects.

All considerations have in common that the word's definition changed in the course of history. In this regard, one thing seems true. The daily landscape is what we see

and experience; full of meanings, stories and emotions. Our perception of the physical landscape is colored by knowledge, judgements based on norms and values, and interests. This makes landscape a case of subjective perception that is interpreted differently by various communities and individuals. The meaning of landscape above all is a cultural unity, defined differently in time, place and mind.

Landscape in the Dutch context

The Dutch landscape is a special landscape in many ways. The land is perceived as completely flat, at least it seems so to foreign people. Except from the most southern part of the country, the south of the province of Limburg, the altitude of the land almost never rises above the hundred meters. The flatness of the lands results from relatively young geological formations that are mainly shaped by wind, water and sometimes ice. Those ice shaped areas are in fact the only places where some steep slopes and deeper valley can be found. For the remaining part, the land is formed by sedimentation processes, wind, or water. Rock formations are not found near the surface and soils mainly consist of sand, clay and peat vegetations.

With these geological and hydrological conditions, almost all regions are perfectly workable for agricultural activities. Even though some regions are earlier cultivated than others, nowadays all the land has been adapted to human use. Speaking in terms of cultivated or cultural, we can state that next to more natural landscapes there are cultivated or cultural landscapes as well. According to Lemaire, cultural landscapes are

landscapes in which the natural circumstances are adapted to human needs with the purpose of human use and exploitation (Vroom and Ettema, 2005: 197). As the Dutch landscape shows, they all can be defined as cultural, since nearly all of them are in some way transformed or even made by human actions. Only the Wadden shallows are often called to be the final real natural landscape of The Netherlands, although even here some transformations can be addressed to human activities like fishery, land reclamation, and gas drilling.

Cultural landscapes do not only have physical components like typical occupation patterns of the peat meadow landscape. Next to the physical, a more social component can be distinguished. The social part of the landscape explains for what reasons typical landscapes like peat meadows have developed as they appear to us nowadays. These aspects comprise relations between ownership and use of the land and socio-cultural, political and financial aspects. As explained before, many of those aspects are not directly visible in the field.

The fact that the Dutch put a lot of claims on the land partly roots in a dense population per square kilometer, especially in the west of the country. Nearly every piece of land is made suitable for often intense forms of land use. In recent decades, metropolitan uses like housing districts, industrial areas and infrastructure networks occupy an even growing part of the land. Opposed to these developments, also the remaining agricultural landscape is appreciated. Next to recreation facilities and rural housing, leisure and nature areas are located in these remaining parts of the old landscape.

A useful landscape definition

Within the context of an intensely used cultural landscape, we can formulate a useful meaning of landscape that covers both physical as well as social and personal views on the land. This meaning is in accordance with the definition that the European Landscape Convention (Council of Europe, 2006) formulated. In their words, the landscape is:

“A zone or area as perceived by local people or visitors, whose visual features and character are the result of the action of natural and/or cultural (that is, human) factors. This definition reflects the idea that landscapes evolve through time, as a result of being acted upon by natural forces and human beings. It also underlines that a landscape forms a whole, whose natural and cultural components are taken together, not separately.”

The definition makes clear that existence of typical landscapes originates in interrelationships between the physical reality and our human perception. Landscape is more than just the inherent physical characteristics of the land and includes both a physical and a social understanding, resulting in an aesthetic appreciation of the environment.

Landscape as a means for planning and design

Only a definition of landscape does not help us much further to come to a valuable new approach of new nature areas in the Dutch landscape. With the definition of landscape in mind, we need to explore landscape ap-

proaches that proved themselves in planning and design practices. Out of these, we are able to extract and combine those aspects that can be useful to look at Dutch nature areas from a landscape perspective instead of a biodiversity perspective (see also chapter 1.3).

Ultimately, a nature approach based on nature is constructed in which the appearance of nature is considered in the context of the surrounding landscape.

In the next paragraph, we describe landscape approaches. They have in common that they see the landscape as the medium in which people display their interests and activities. It is not only important for individuals or certain groups of people, but bears a common interest for all of us.

From different perspectives, three groups of approaches are presented, which focus on historical, spatial and mental issues of the landscape. We do not intend to give a complete overview. The selected approaches are used as a source of inspiration and as a reflection on landscape planning and design.

Historical approaches

Landscape as a cultural expression

Talking about the cultural landscape, references are made to landscape genesis and especially to the influence of humans related to a time context. Cultural historians view landscape as a repercussion of human culture, related to the ethics of art (Renes, 2006). According to Renes, cultural historical values of landscape are concerned with time aspects and the historical layering of the landscape (115). Every change in the landscape by men can be viewed as a cultural act. This view forms the starting point for cultural history and for valuating landscape changes. Ideally, every landscape change adds something new to the landscape without removing the remnants from the past.

Soil type	Cultivation
Dune landscapes	Dunes and dune cultivations
River landscapes	Natural levees and sedimentation bases
Sea clay landscapes	Old polders, new polders, reclaimed lakes
Peat landscapes	Peat cultivations, peat colonies
Sand landscapes	Camp cultivations with arable fields, river terrace cultivations, moor cultivations
Löss landscapes	Löss cultivations

Cultural historical landscape typologies

Source: adapted from Barends et al. (Barends et al., 1997)

The cultural historical approach

In the cultural historical approach, landscape is an accumulation of remnants from the past. Landscape typologies emerge from different historical use based on different soils qualities. Elevation of the landscape compared to sea level, soil, ways of cultivation and periods of cultivation are all part of the landscape typology (Barends et al., 1997). These typologies are also mostly geographical, describing physical characteristics and the way men influenced its existence. Accordingly, cultural geographers mean that landscape comes into existence when people show up (Barends et al.). Wilderness areas without human influence are no landscapes.

Presence of men is required considering landscape development. Growing populations cause a bigger use of landscape. Historically, there is a development from autarky to trade market. A growing population is also characterized by a growth of cities from the 16th century on.

A geographical landscape typology

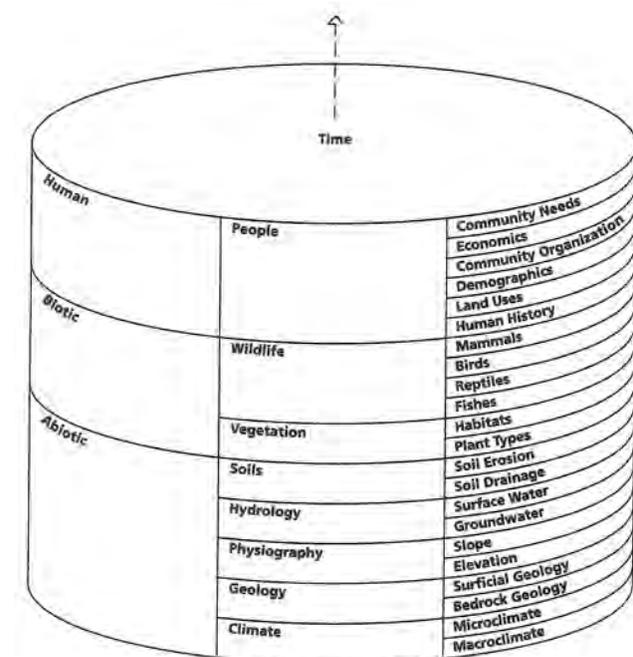
The cultural historical approach had been used for a geographical typology of landscape (see table of cultural historical landscape typologies). Based on vertical relations between soil, time and human influence, a horizontal division can be made. Barends et al. (1997) developed a typology based on cultivation type, which relates time of cultivation to soil characteristics. The visible landscape which is mentioned by the European Landscape Convention appears from an historical perspective in these geographical areas. Studying landscape in this study, the presented historical approach here forms a framework for analysis concerning horizontal relations in the landscape.

Spatial approaches

In spatial approaches, landscape can be seen from different perspectives. Some perspectives pay attention to relations between physical functions and layers that can be distinguished, while others emphasize the relation between physical and social organization.

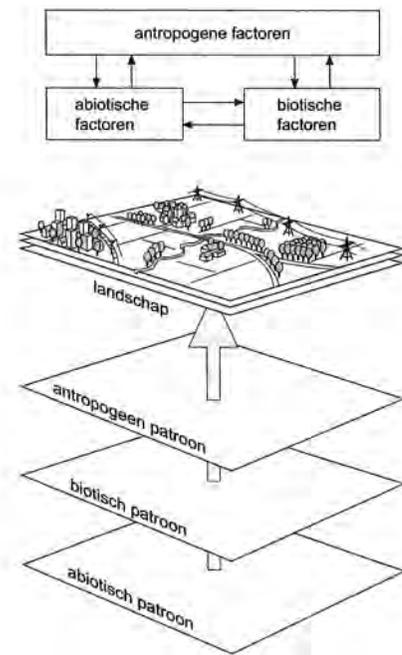
The layer cake landscape

The layer cake landscape represents an analysis of spatial, physical and sometimes social characteristics (see diagram of the layer cake landscape). McHarg (MacHarg, 1969) is one of the first authors using layer models. The basis of the approach is found in the study of natural phenomena as dynamics, interactive processes, which provide opportunities and limitations to human use. By

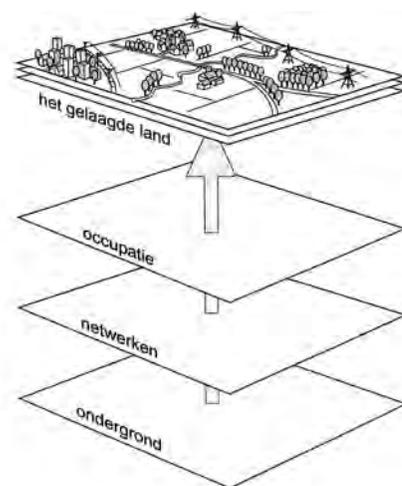


The layer cake landscape after McHarg

Source: Steiner (2000)



The triplex model after Kerkstra and Vrijlandt
source: Hidding (2006)



The layer approach after Sijmons
source: Hidding (2006)

be made visible. Suitability can be valued and ranked within typical categories, such as physiographic characteristics like soil and water qualities, and social characteristics like recreation, residential, water, or wildlife values. These different categories provide sets of maps or overlays with different color intensities indicating intrinsic values.

Every overlay shows best suitable, second choice and unsuitable areas. Suitable areas are colored light, unsuitable areas dark. When more layers are put on top of each other, a composite map is created, and color intensities merge. Finally, differences in color indicate differences in suitability for typical forms of land-use, measured against typical characteristics. Due to this approach, the choice for a location is based on cumulated values given by the layers. Spatial, physical and social characteristics have to be generalized and quantified before they are applicable. This results in a rather technical approach to landscape design.

The triplex model

Scholars from Wageningen present a different layer model, the so called triplex approach (Vrijlandt, 2003, Kerkstra et al., 1976). This model distinguishes an abiotic, a biotic, and an anthropological layer (see diagram of the triplex model). The model focuses on processes forming landscape and distinguishes these processes when designing. The model also mentions a priority in design: firstly abiotic processes are considered, secondly biotic processes and finally anthropological characteristics. This priority acknowledges a dependence of anthropological use on abiotic and biotic processes and qualities. This also makes the model more normative than the layer cake model of McHarg. Moreover, landscape design does

not result from constraints, but builds on the landscape processes and patterns. Another difference is the use of the model: the Wageningen model is especially used in landscape analyses.

The layer approach

Based on principles of the layer model from Wageningen and inspired by a spatial and functional separation of high dynamic and low dynamic processes in the casco approach (Bruin et al., 1987, Kerkstra and Vrijlandt, 1988), Sijmons designed a leading design and planning model (see diagram of the layer approach). This model, named layer approach, implicates a hierarchy in planning and designing landscape changes. Networks and occupation should follow conditions of the surface layer and occupation should follow the conditions of the network layer. Although Sijmons emphasizes that the layer model is not just a tool for analyzing the landscape, but rather a design strategy, we use his approach here to discern different appearances of nature. Sijmons spent special attention to the implications for nature (Sijmons, 2002; Feddes et al., 1998). He discerns three layers of nature with different functions. The function of nature in the surface layer might be a way of dealing with water problems. Nature can help in retaining and storing water and give space to peak flows of the rivers. The function of nature in the network layer is related to the ecological processes. As part of an ecological network, it guarantees biodiversity goals. Finally, the functioning of nature in the occupation layer has to do with recreational use. As planning scales of nature functions differ, nature accordingly can not be part of one specific layer.

The social-physical organization

Different from layer approaches of landscape architects, spatial planners view the living environment from an organizational perspective. It is not as much about driving forces behind landscape, but rather about the driving forces behind society which form the basis of spatial organizations.

Kleefmann and others developed a model of living environment (Hidding, 2006). According to them the living environment is equal to the social-physical organization (see diagram of the MFO model). This social-physical organization is created by society according to a social organization principle. This social organization principle consists of an economic, a political and a cultural subsystem, which fit into abiotic and biotic subsystems of the natural system.

Seen from a spatial perspective, the organization is characterized by both the social-spatial organization and the physical-spatial organization. Social-spatial characteristics allocate different land uses, connections between different locations, and activities. Physical-spatial characteristics

appear in the way the land is transformed in favour of specific land uses.

Focussing on land use, Hidding mentions that it always reflects a social purpose and that land use is a result of allocation. However, land use also concerns design and management of allocated areas.

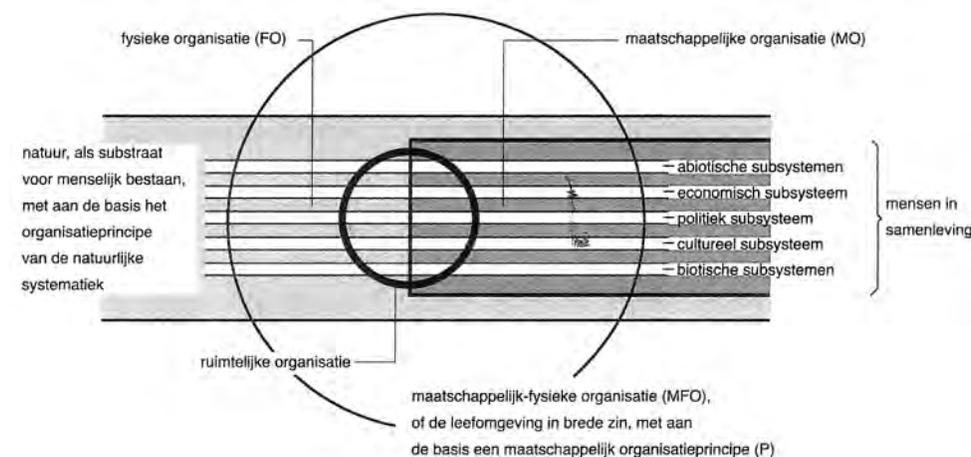
The close relationship between the layer approaches and the model of the social-physical organization is demonstrated by Duchhart (Duchhart, 2007). The author recognizes that the visualization of the natural system is equal in both the triplex model and the model of the social-physical organization (see diagram of a combination of the MFO and the triplex model). According to Duchhart, the landscape of organization starts in the anthropogenic layer of the triplex model. The model of the social-physical organization explains the driving forces behind the landscape of the triplex model. By this analysis, Duchhart proves that landscape and spatial organization are no different realities, but closely related and dependent on each other.

Mental approaches

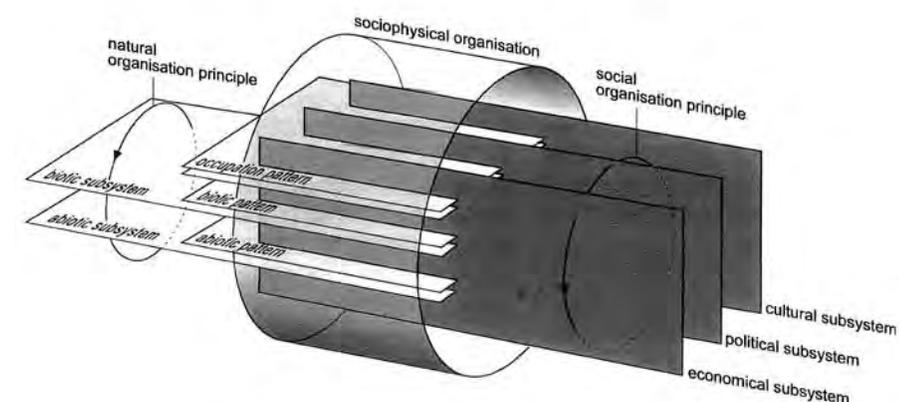
The discussed landscape approaches all are mental constructions of what people see and experience. Mental approaches are concerned with these different perceptions of landscape.

The man-made landscape

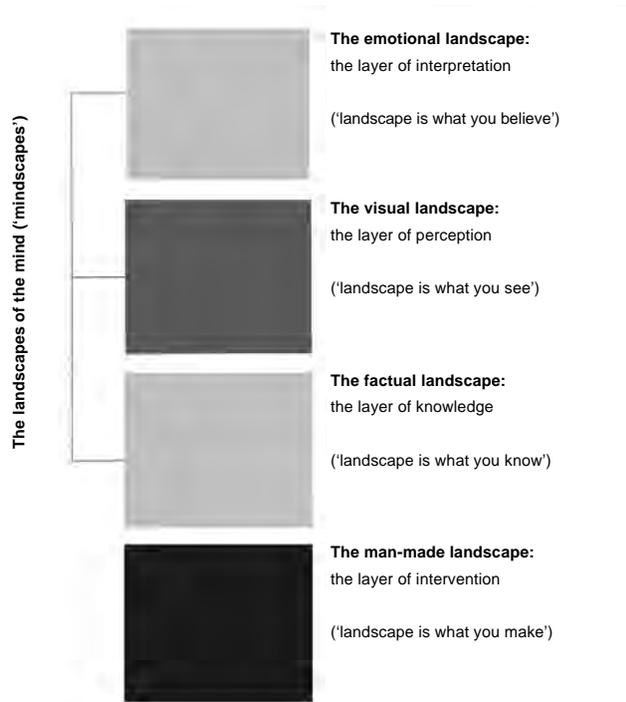
Lorzing emphasizes that *“the balance of natural and man-made (or cultural) components is an essential part in the description of any landscape in the world”* (Lorzing, 2001) According to Lorzing, nature and landscape are mostly a product of mind (see diagram of the man-made landscape). He sees three approaches of the man-made landscape: the factual, the visual and the emotional. Based on a pragmatic distinction of these landscapes, different approaches of the man-made landscape are a first step in the development of an abstraction of the perception of landscape in people’s mind.



The MFO-model after Kleefmann
Source: Hidding (2006)



The MFO-model combined with the triplex model
Source: Duchhart (2007)



The man-made landscape by Lörzing
source: Lörzing (2001)

Powerscape, matterscape and mindscape

Jacobs divides reality in three kinds of reality: physical reality, social reality and inner reality (Jacobs, 2002, Tress et al., 2004). Based on these realities Jacobs describes a landscape ontology distinguishing three appearances of landscape: matterscape, powerscape, and mindscape (see diagram of landscape 3). Matterscape is the landscape of facts, powerscape is the landscape of norms, and mindscape is the landscape of personal meaning. Jacobs elaborates on how we can gain knowledge about these landscape appearances. Following Habermas, knowledge about the matterscape is valid if true, knowledge about the powerscape if just, and knowledge about mindscape if truthful. Different *scapes* are studied by different disciplines. The objective for planning and design is to take into account different scapes in order to develop living environments which function well on all three levels.

Considerations on a landscape approach for nature

Differences and similarities

In reviewing the three sets of different landscape approaches, there appear to be some general differences and similarities.

The three different sets come from in different disciplines. As their name reveals, historical approaches look at the history of the landscape. It's the discipline of historians and spatial, cultural history. In a direct way, they mainly deal with the physical reality of landscape. Indi-

rectly however, they value the relevance of historical objects for today's and future generations. This discipline has a supportive position in relation to disciplines like planning and design.

Spatial approaches originate in the field of landscape planners and designers. Approaches in this area carry a strong normative character, since they should directly decide on daily issues relevant in society. The approaches describe both physical landscapes as well as the social context in which landscapes developed.

Mental approaches do not directly study physical landscapes, but are more related to social aspects of how people perceive and value their environment.

All approaches that deal with the physical landscape recognize natural processes of essential importance for the functioning of our society and the environment. Besides, the cultural historical approach, the model of the social-physical organization, and mental approaches show the influence of social considerations and norms on landscape. Especially mental approaches take into account human perceptions of landscape, which determines the experience of landscape design.

Useful components

How can we combine all the useful components of historical, spatial and mental landscape approaches into one landscape approach for the development of new nature areas? We will try to answer this question from our initial problem definition of nature development in the Dutch landscape. It poses that nature should no longer be developed from a biodiversity perspective only. In relation to

Landscape / phenomenon	Matterscape	Powerscape	Mindscape
Mode of reality	physical reality	social reality	inner reality
Validity claim	truth	justness	truthfulness
Science	natural sciences	social sciences	experience sciences

Landscape 3 by Jacobs
source: Jacobs (2002)

landscape approaches that are reviewed, three components are of importance for the explanation of the perspective used in this study: process, organization and aesthetics.

Process

Processes in the landscape are about the elapse of space and time. Time scales range from hours in a day to seasons in a year and centuries in a millennium. And now we are only talking about the time scales that humans can imagine. Geological processes for example deal with time scales that lie beyond human imagination.

Processes in the landscape often ground in natural processes that act upon the way the world functions and looks like. The functioning of an ecosystem is an example of a system of processes. Another example is the landscape's soil quality and water system that directs human occupation. As a result of these processes, every place in the environment gets its own form, whether this is a completely untouched ecosystem or the agricultural land use of a farmland area.

Two kinds of processes are distinguished, historical and ecological. Process can also show itself in a historical way like the historically grown cultural landscapes, but also in an ecological way, like the succession stages of an ecosystem. If we take a look at the reviewed landscape approaches, every group in some way deals with processes, whether historical or natural.

The process character of the landscape can be called the geographical landscape, since all landscape processes are about the relations between time and a geographical location.

Organization

The powerscape which is mentioned by Jacobs is the framework for the understanding of organization. This social perspective on landscape emphasizes normative aspects which direct people's actions. Our conception of organization has many similarities with the social subsystems of the social-physical organization model from Kleefmann. It's about social forces that shape the physical organization: economy, culture and politics. Social forces come from beliefs, interests and power and result in norms, policies, rules and laws that affect not only the way we act but also the way the landscape looks. Organization is not solely seen as a product of society, but also as a product of individual thinking and acting. The organization component of the landscape describes the social landscape.

Aesthetics

The shape of the landscape is its physical and aesthetic appearance; it can be called the aesthetic landscape. Aesthetics is about beauty and can be pleasing or inconvenient, gentle or rough, moderate or lively. It can be flat or have a clear third dimension; it can consist of a single element or an entire pattern. The way in which typical aesthetics are appreciated might originate in a historically grown landscape, in this way it is related to historical landscape approaches. Also its appreciation is related to our society - what generally is ought to be beautiful - and individual opinions. Relations with mental landscape approaches are abundant.

It seems that all three groups of landscape approaches (historical, spatial and mental) have something to do

with the aesthetic landscape. Most directly corresponding with landscape aesthetics however are the triplex model (Kerkstra et al) and the layer model from Sijmons. They speak about the aesthetics of typical cultivation and occupation patterns.

Landscape components combined

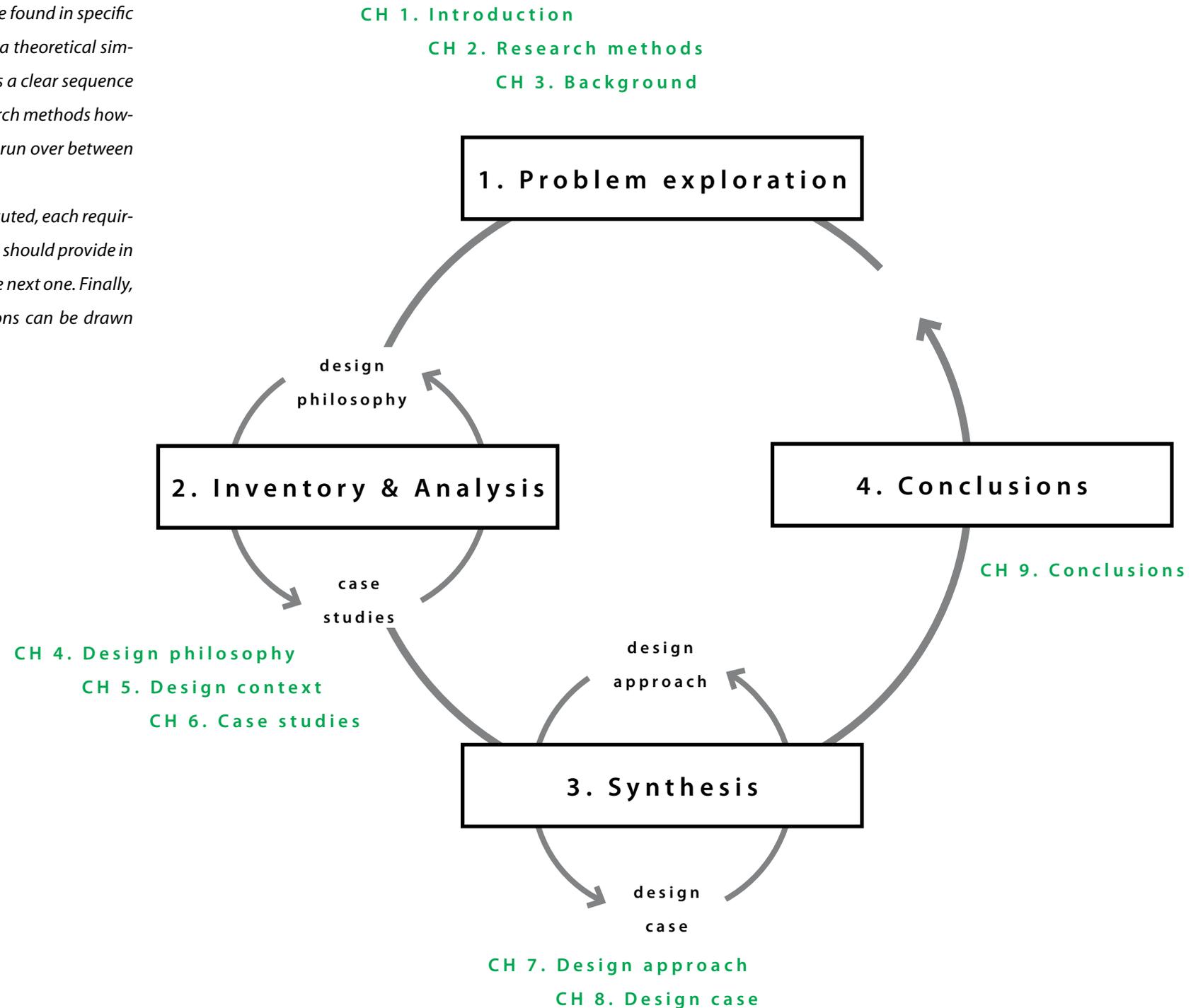
The components process, organization and aesthetics are considered to be three equal forces that direct the physical landscape. All three components have both social as well as physical aspects. In this regard, even the process component is influenced by human activities. Processes that create for example the Dutch heath ecosystems are adapted by human intervention because they are grazed by sheep herds to prevent forestation.

For this study, the components process, organization and aesthetics form the ingredients of our conception of landscape. They are related to roles of nature, the analysis of nature and landscape, and the development of a landscape approach for new nature areas.

2.3 Methods

Means to execute the research strategy are found in specific methods to analyze data. The strategy is a theoretical simplification of the research process. It offers a clear sequence of phases for the entire process. The research methods however are not bound to specific phases but run over between them gradually.

Different kinds of analyses have been executed, each requiring specific methods. Every single analysis should provide in conclusions and recommendations for the next one. Finally, general conclusions and recommendations can be drawn from the results of all four analyses.



Problem exploration

The problem exploration focuses on literature review. The gathered information gives background knowledge on the research problem and on the way the problem is approached. The literature review contains different parts:

- Exploring the common ground of landscape architecture and planning in concepts about landscape.
- Exploring the history of nature conservation.
- Exploring nature and landscape policies.

For a review of concepts about landscape and landscape policies, original sources have been collected, selected and summarized. We based our selection on what we thought to be significant sources. Exploration of the history of nature conservation is based on standard works and articles on this history. In other words, we used secondary sources for this part of the literature review.

Inventory and analysis

Inventory and analysis is done on both theoretical and practical level. These two rather separated parts of the research contain theoretical and empirical building blocks. Because we do not think one general (design) solution for the research problem exists, we have done a field study in addition to theoretical explorations. Both parts provide in essential knowledge to come up with design solutions.

Literature review and analysis

A theoretical background is given by reviewing literature on the meaning of nature and by the analysis of spatial concepts for nature planning. Considerations on spatial concepts are used for the development of a landscape perspective on nature.

Exploration on a regional level

Parallel to literature review, the Wetland Corridor is explored and provides in a practical background to study local case areas. Exploration of the Wetland Corridor will be the main looking glass through which the main research question is approached. Exploration of the Wetland Corridor should therefore generate criteria to investigate the local cases.

Knowledge and understanding of the regional case is gained by field trips to the area, reading essential plan and policy documents and studying maps of the area.

Case studies on a local level

Inventory of local cases has been done by different data collection methods with different techniques: map study, visual study, interviewing key informants, document and literature study. These methods have been chosen to get information about specific nature and landscape characteristics of the area.

We used map study to get insight in the history of the case areas, abiotic characteristics and land use. The visual study gives information about issues related to landscape experience and detailed information about land use. Interviewing key informants generates information on ecological and design considerations in the area. Doc-

uments give information about policy objectives, while literature is a major source in gaining information about cultural history, ecology and hydrology.

Analysis of empirical data

The analysis contains two different phases. Firstly the landscape is analyzed by distinguishing different layers. The cultivation layer, the road system layer and the mass-space layer especially deal with the physical landscape, while the activities layer discusses the social activities in this landscape. These four layers turned out to be essential in spatial processes, aesthetics and organization of the landscape.

Secondly, the value of nature is analyzed on three different issues. Corresponding to the outcomes of the literature review (see chapter 4) and different policies on nature we can distinguish ecological, cultural, and recreational values of nature. The analysis learns where which values of nature exist and how they relate to landscape characteristics

Synthesis

The results of literature review and local case studies come together in the synthesis phase. Like inventory and analysis, the synthesis phase contains a theoretical and practical part. The theoretical part introduces an approach for the peat meadow landscape, while this approach is applied in the test case of Oude Rijn. Both the approach and testing have been based on complete inventory and analysis (theoretical and empirical).

Data collection method	Techniques
Map study	<ul style="list-style-type: none"> • Comparing historical maps to recent topographical maps • Studying soils of study area • Analyzing aerial photographs
Visual study	<ul style="list-style-type: none"> • Experiencing the landscape characteristics during excursions • Analysing pictures taken during the excursions • Analysing the influence of metropolitan developments • Analysing the appearance of new and old nature areas
Interviewing key informants	<ul style="list-style-type: none"> • Asking questions about the design of new nature areas • Asking questions about the objectives of new nature areas • Asking questions about influential theories and concepts • Asking questions about the social support for new nature • Asking questions about the landscape processes
Documents	<ul style="list-style-type: none"> • Reading policies concerning the development of new nature areas • Studying web sites and information bulletins of stake holders • Reading reports about local nature development projects
Literature	<ul style="list-style-type: none"> • Studying cultural historical literature • Studying nature development guidelines • Studying hydrological literature

Data collection procedures for local case studies

Landscape analysis	Nature analysis
<ul style="list-style-type: none"> • Cultivation / water system • Road system • Mass - space • Activities 	<ul style="list-style-type: none"> • Ecological values of nature • Cultural values of nature • Recreational values of nature

Data analysis procedures for local case studies

Building an approach

The approach combines results of local case studies and theoretical considerations. Interpretation of results provides in planning and design principles to build the approach. Landscape characteristics have been related to value, use and spatial position of nature. On the other hand, ecological theory and landscape concepts are included. Creative leaps are used for the integration of theory and empirical data in a spatial model.

The approach does not consist of general solutions, but rather provide in recommendations useful for future nature planning and design practices. Therefore, it is characterised by flexibility and when applied in practice it anticipates on specific site conditions. In order to reach this flexibility, the approach focuses on one type of landscape and one specific area: the peat meadow landscape of the Green Heart. Different landscapes might ask for different solutions.

Testing the approach

The new approach has been applied in an experimental design case. This design gives the opportunity to evaluate

the new approach. Moreover, it is an application of the design approach on site level. In this phase, not only design possibilities but also procedural aspects are explored. Feasibility is central in this discussion.

The design case plan is based on an integration of a detailed landscape analysis and the design approach. Analysis is done by a deeper study of hierarchy in road and water system and of roles of nature of the area. Creative leaps are used for the application of the design approach in the design case based on characteristics of the case area.

Conclusions

Conclusions are based on an evaluation of the design case plan and the design approach. The research question is answered by reflection on the nature policies and design solutions given by the research. Moreover, by evaluation of the landscape perspective, the possible value of this idea for nature conservation and development in general has been considered.



Background

3

Dutch nature conservation

Introduction

For a long time, landscape and nature were integrated in one national policy on landscape, nature and agriculture. From the nineties onwards however, the importance of issues on nature and landscape grew and ultimately resulted in separated policies. Various explanations can be given to have caused this division. Biodiversity became an important issue worldwide. Landscape or the living environment also became highly valued and especially for The Netherlands this had major consequences. In case of The Netherlands, also the focus of nature policies changed. Former protective strategies were replaced by a more offensive approach, which in the end did not match with issues involved with the landscape any more.

This chapter deals with the history of Dutch nature conservation and relates contemporary considerations and decisions on nature development to happenings and policies in the past. Purpose is to understand the development of today's nature and landscape policies. Also we reflect on the relation between research on nature and conservation movements, and the implementation of these ideas in nature policies.

The first part consists of a brief historical overview of Dutch nature conservation. The second part discusses contemporary nature conservation policies. Finally, we elaborate on some developments and policies and clarify how in our opinion we should deal with nature conservation in the future.



Central Park NY (1857) A public city park to enjoy the beauty of nature



Beekbergerwoud (1871) Cut down of the last primeval forest of the Netherlands



Yellowstone (1872) The first national park of the US

Industrialization and urbanization (up till 1901)

In The Netherlands, public care for nature emerges at the end of the nineteenth century. Early nature conservation movements are highly influenced by developments in nature conservation abroad, especially considering influences from science, traditions in landscape design, and individual thoughts by artists and philosophers (see also the time line on 150 years of nature conservation on page 46).

Foreign influences

In the middle of the century views on nature were, even though humans believed that they could rule nature, still highly static and considered as a finished product of religious thinking. An important change came from the field of biology with the evolution theory by Charles Darwin (On the origin of species, 1859) and resulted in an increasing interest in nature's laws and natural sciences.

In the United States, public care for nature results from poor living conditions in rapidly growing industrialized urban areas. Nature is brought to the city by the development of urban parks, which for the first time in history are open for public. These parks represent nature as in the English landscape style and serve the purpose to offer relaxation for all social classes. As the city's counterpart, nature is a matter of health. Great pioneer of public parks in the United States is Fredrick Law Olmsted. In 1857, together with Calvert Vaux he designed Central Park, New York, which can be called the first deliberately

established public park. During that time, Olmsted also initiated the foundation of National Parks outside cities, in essence comparable with his public park designs. Main purpose of protecting large natural areas by means of national parks results from their recreational importance and the threat of overexploiting by agriculture, forestry and mining. In 1872 the first national park was appointed: Yellowstone (Van der Windt, 1995).

Next to influences from the United States also German ideas affected the Dutch nature conservation. Philosopher Goethe attended for a declaration of the rights of nature and biologist Von Humbolt came up with the idea of founding natural monuments. These ideas formed the beginning of a new conservation movement that adopted a redefined Arcadian view on nature (see also chapter 4). The movement opposed itself against a continued growth of industries and changes it holds for city and countryside. (Van der Windt, 1995).

Van Eeden: an ecological approach

Thoughts on nature conservation in the Netherlands were, according to Coesèl, closely related to economic prosperity, industrialization and urbanization, but also influenced by socialism, art, science and educational changes (Van Loon et al., 1996). The first idea of nature conservation was initiated by elitist hunters from the aristocracy. They took care of the conservation of animals they hunted after. Farmers were not allowed to hunt and agricultural damage caused by those animals was compensated. To make sure that hunted animals kept a stable population, their natural enemies were also hunted to prevent predation of deer, wild pigs and roe (Drees, 2003).

One of the first persons concerned with nature conservation in a broad sense was biologist Frederick Willem van Eeden (1829-1901). He adopted an ecological approach with his plea to conserve both species and nature reserves, published in a book "Album der Natuur" (Drees, 2003, Van der Windt, 1995). The effort of Van Eeden resulted in the acceptance of the Nuttige Dierenwet (Useful Animals Act) in 1880, which regulated the preservation of mostly small mammals, reptiles and birds which were important for forestry and agriculture. This act got support from agricultural organizations and the Dierenbescherming (animal protection society), which was founded in 1864 and can be considered as the first nature conservation organization in the Netherlands (Drees, 2003, Van der Windt, 1995).

Pioneers Heimans and Thijssse

In particular, Heimans (1889-1978) and Thijssse (1865-1945) were important for the development of Dutch nature conservation, especially in raising social awareness of nature's values. Teacher Heimans was important in the modernization of educating biology on primary school and in 1893 he wrote a new manual on nature education with the name "De Levende Natuur" (The Living Nature) that became highly influential. Some years later in 1896, Heimans and Thijssse started to publish a magazine on study of nature, also called "De Levende Natuur". They based nature education on sensorial observation. Motive in nature study is found in its beauty and enjoyment. Although the magazine still exists, after more than hundred years its content changed a lot. Heimans and Thijssse did not stand alone that time. There were close



Naardermeer (1904) First purchase of the Dutch nature conservation movement (Natuurmonumenten)



Veluwezoom (1930) conserved 'wild area' as the first Dutch national park

contacts with a larger movement of young artists and scientists and published the magazine "De Nieuwe Gids". Like the Heimans and Thijssse, this group (who called themselves "De Tachtigers") had nature and landscape as an important source of inspiration.

Foundation of nature conservation (1901-1930)

The idea of nature conservation could only settle because of an increasing interest and knowledge of nature. This recognition gained attention in the beginning of the twentieth century and resulted in the founding of the Royal Dutch Nature Historical Association (KNNV) in 1901.

Founding of Natuurmonumenten

Some years later in 1905, the Vereniging tot Behoud van Natuurmonumenten (Association for conservation of nature monuments) was founded. Its establishment resulted from the purchase of Lake Naarden one year earlier by a group of naturalists with among them Heimans and Thijssse. Both the purchase of Lake Naarden as being the first protected nature area as well as the founding of Natuurmonumenten are considered as the official start of nature conservation in The Netherlands.

The initial idea of nature conservation in practice only meant that specific nature areas were protected. On one hand, they were used for the education and study of biology, on the other hand for the benefit of future generations. For the landscape in general, nature protection did

not have major consequences. Agricultural exploitations still had a large impact on the landscape and determined for the greater part how it looked and was appreciated. In terms of land use, protected nature areas like Lake Naarden were rather incidents. Thijssse for example acknowledged both the importance of nature and economic development (agriculture) for prosperity and pleasure.

Protection of birds

Conservation of nature did not only comprehend public initiatives. With some years delay attention for nature conservation reached the level of national government as well. This resulted in the Vogelwet (Birds Act) in 1912, 13 years after the founding of the Vogelbescherming (Association for Protection of Birds) in 1899. The founding of the latter was a reaction on the use of feathers in women's hats. From now on, birds became one of the priorities of nature conservation, especially in the first half of the 20th century. After the approval of the Birds Act, hunting was only allowed if birds were harmful or were used as food (Vogelbescherming Nederland, 2007). Its interesting why there was so much attention for birds. Possibly, this is because they are associated with a sense freedom. The fact that they live close to urban people might also have played a role.

Protection of forests

Another important act that was approved was the Boswet (Forest Act) in 1922. Influenced by the First World War, the need for burning materials for domestic purposes was growing. As a result, a lot of wooded areas

were logged and peat bogs were exploited. When the logging became worse, the government determined emergency legislation in 1917 that forbade logging unless permission was given by Staatsbosbeheer (the national forest service). In 1922, this legislation was replaced by the Boswet. Although this act was less strict for private persons, it still forbade logging large quantities without permission. During this time, Thijsse sees that people start to talk about “our” forests (Thijsse, 1946), which indicates that people consider forests to be public property. Next to its purpose as a supplier of timber, forests are appreciated for their intrinsic natural values.

Agricultural cultivations (1930-1945)

During the first part of the twentieth century, the destruction of “nature” reached its peak till now. Several wild areas were cultivated for agricultural use, including large moorlands in sandy landscapes, peat bogs and marshlands. The earlier strategy by nature conservationists to conserve only a limited number of areas was considered to be insufficient. Nature conservationists started to object on mass destruction of nature, which caused the first confrontation with farmers. Nature conservationists reacted on these developments in two ways. Firstly, they started a commission which performed political pressure. Secondly, they made a list about areas which contained most important natural beauty.

An act on natural beauty

The second stage in nature legislation was the *Natuurschoonwet* (Natural Beauty Act), which was founded in 1928 and regulates the conservation of estate areas larger than 5 hectares by tax measures (Unie van Bosgroepen et al., 2007). During the thirties of the twentieth century, the construction of the *Amsterdamse Bos* (Amsterdam Forest) was started. This hybrid of nature area and park was already invented by Thijsse at the beginning of the century as an area for urban people to practice nature study. Accordingly, the Amsterdamse Bos might be considered as the first nature development project. The project is also an indication for the increasing recreational value of nature.

Nature conservation as a social movement

Most wilderness areas disappeared after the foundation of the first legislation. Because of economic recession, an unemployment relief was started by the government in the thirties. The projects of the relief existed most times of cultural technical operations. Especially these projects made nature conservationists to make their strategy more explicit. From then on, nature conservation became a social movement (Van der Windt, 1995). The protection of the valley of the river Geul is the occasion for the foundation of the *Contact Commissie inzake Natuurbescherming* (committee that performed political pressure) in 1932. The committee combines very different interests related to nature conservation: scientific organizations, recreational organizations, a club of car owners and an organization of hostels. One of the first activities of the committee is a request to the government to

take advice in all governmental projects that possibly affect or change the landscape. The committee had in mind that the government considers nature and landscape interests while taking decisions (Van der Windt, 1995). The opposition of the committee was concerned with agricultural cultivations. This resulted in a problematic relationship with agricultural organizations, who asked the government to ignore the new committee. In reaction to a new plan for the cultivation of almost one hundred thousand hectares, the committee felt it was necessary to formulate a priority list about natural areas that should be conserved. Discussions about priorities uncovered very different views on nature within the committee. Scientific biologists and people with recreational and landscape interests disagreed on which areas are most valuable (Van der Windt, 1995). Finally, the biologist Westhoff came up with a compromise in this debate by stating that the focus should be on the conservation of ecosystems instead of specific plant and animal species. Accordingly, a classification was made about valuable nature areas and valuable cultural landscapes (Van Loon et al., 1996). The list turned out to be important during the early forties, when it became the source for a determination of nature areas in the first national spatial plan (Van der Windt, 1995).

Agricultural mechanization (1945-1960)

During the forties and fifties of the 20th century, the scope of Natuurmonumenten was expanding. After the

acknowledgement of recreation as an important purpose for nature conservation, the value of cultural landscape gained recognition. People became aware that almost all landscapes were developed with human influences. According to van Zanden, this broadened scope did not have much success considering the political attention for nature and landscape (Van Loon et al., 1996).

The value of the cultural landscape

After the Second World War, the focus of the government was on agricultural development. Cramer mentions that after threats from cultivation activities during the Interbellum, from now on postwar land consolidation projects and pesticides became problematic for the nature values in the cultural landscapes (Van Loon et al., 1996). Land consolidations were highly supported by the government. Mostly, these threats made nature conservationist aware of the value of the cultural landscape. Cramer mentions that many nature conservationists believed that economic progress was very important and that land consolidations should continue, despite the loss of nature (Van Loon et al., 1996). This clarifies a restraint attitude of nature conservationists during these years.

On the other hand, interest of the government in nature conservation continued in the period after the war. Governments from several countries and nature conservation parties founded the International Union on the Protection of Nature (IUPN) in 1948. From 1956 onwards, the union changed its name to International Union on the Conservation of Nature and Natural Resources (IUCN), and are now known as the World Conser-

vation Union. The IUCN was the first international initiative on nature conservation. Cooperation between NGO's, government agencies and scientists made the nature conservation movement international influential.

Environmental pollution (1960-1975)

Till the Second World War, nature conservation was the domain of liberal elitists. Later, the socialistic movement adopted the 'green' ideology, which focused on environmental issues more than nature conservation. This socialistic movement originated in a resistance to economic development which threatened social and environmental values. Finally, nature conservation and environmental groups got closer by the foundation of the Vereniging Natuur en Milieu (Association for Nature and Environmental Issues). Cramer describes that both movements remain separate despite the cooperation in the new association. Especially the environmental movement felt that nature conservationists were not enough involved in politics (Van Loon et al., 1996).

Conflicts between nature and agriculture

During the sixties and seventies, the nature conservation movement got some response from the government. In 1967 the *Natuurbeschermingswet* (Nature Conservation Act) became operative, which determines the protection of so called nature monuments. This act regulated the

conservation of both areas and species. Despite the *Natuurbeschermingswet*, the conflicts between nature and landscape conservation and agriculture became an increasing problem. Considering the importance of economic progress, nature conservationists understood they had to react in a different way on the loss of nature. This new strategy should consider agriculture and nature conservation together. Different types of nature were defined: wilderness areas, cultural landscapes with natural values maintained by agriculture, and agricultural areas. This zoning should create a new balance between agriculture and nature conservation.

Reservation areas

The zoning plan from the nature conservationists became influential. The government acknowledged the problematic relation between agriculture, nature and landscape and answered by a new policy. The *Nota betreffende de relatie landbouw en natuur- en landschapsbehoud* (Policy plan about the relation between agriculture and nature and landscape conservation), determines the allocation of reservation areas and management areas (Ministerie van Landbouw en et al., 1975). Reservation areas are characterised by a high quality of nature and high vulnerability of nature and landscape. They are used as a place of refuge by flora and fauna. The aim for reservation areas is a removal of agriculture. Contrarily, management areas remain agricultural. Agriculture users of this areas will reckon with nature and landscape management and will be compensated for negative effects (Tromp, 2001). The zoning principle still characterizes many spatial policies for the rural areas.

Changing purpose of forests (1975-1990)

The seventies were turbulent years for nature conservation. Apart from breakthroughs in policies and legislation, also natural factors caused small revolutions. This paragraph focuses on international agreements and spontaneous developments in nature, which finally inspired nature conservationist importantly.

International agreements

After the Natuurbeschermingswet, the Dutch government signed the Ramsar Convention about the preservation of wetland areas in 1971. The convention was the first international multilateral convention on nature conservation. Shortly after this first convention, the General Assembly of the United Nations founded the UNEP (United Nations Environmental Programme). This organization became the framework for many international agreements on environmental issues. Firstly, in 1973, a convention on endangered species was ratified (CITES), followed by, among others, a convention on migratory species (1979), the founding of intergovernmental panel on climate change (1988) and the Biodiversity Convention (1992).

Maintenance of forests

During the early seventies, two major storms caused a lot of damage to the Dutch forests. The remaining cleared forest lots lead to burning discussions about the cause of the enormous damage. Possibly, a differ-

ent forest management would cause not as much clear cut. Some ecologists stated that forestry strategies should change dramatically. According to them, forests should be maintained more naturally like primeval forests. Falling trees, dead wood and spontaneous growth of trees were key words in their philosophy. Although nature conservationists and foresters were not convinced directly, after a couple of years the management changed (Van der Windt, 1995). Most extremely, this resulted in the release of cattle in forest areas. Although the grazing not everywhere turns out successful, all new measures indicate the intension to make forest management more in line with the ideal of wilderness areas. This is related to a rising influence of the ecosystem conception based on self-regulation (Van der Windt, 1995).

The concept of the self-regulating ecosystem is also applied to nature that is different from forests. Especially one event strengthens the idea of nature which develops without human interference. During the seventies, by accident the wetland area of the Oostvaardersplassen evolved in the new reclaimed area of the Flevopolders, on a lot reserved for industry. It illustrated that nature could grow out of nothing if conditions were right. The Oostvaardersplassen became an international important nature area and a leading example for nature development.

Separation

Landscape architects and ecologists were inspired by the spontaneity of nature. The conception of nature which approximates the untouched wilderness areas



Oostvaardersplassen (1968) Spontaneous development of 'new nature'



Storms (1972-73) create a shift in the understanding of forest management



Ecoduct Woeste Hoeve (1988) is the first large crossing of human and animal infrastructure



River Ruiten Aa (1992) meanders are reconstructed to create better conditions for flora and fauna

became influential. Landscape architects and ecologists combined the view of self-regulating nature with a spatial concept that separates ecology, landscape and water resources from high dynamic user functions, which they called the casco model (see also chapter 4). The first application of this concept was *Plan Ooievaar* (Plan Stork), which proposed the development of spontaneous nature at the forelands of the rivers Rhine, Waal and Maas in the eastern part of the county. In-between the rivers, reserves areas for agriculture and urbanization were allocated (Bruin et al., 1987).

Another application of the casco model on the sandy soils of the Dutch *Achterhoek* was primarily an answer to landscape objectives. The authors felt that the continuing decline of landscape elements should be answered by a structural solution for both agriculture and landscape (Kerkstra and Vrijlandt, 1988).

Biodiversity goals (1990 - present)

The spontaneous development of the wetlands of the Oostvaardersplassen and the publication of Plan Ooievaar about new wilderness areas along the rivers became leading examples of new ideas about nature. Nature conservationists became aware that only protection of nature was not necessarily the best strategy in stopping the ongoing decline of nature. An offensive strategy might be more effective. The idea of nature development showed new perspectives.

Ecological networks

The government combined the idea of nature development with ecological network theory in the new nature policy plan (Ministerie van Landbouw et al., 1990). The island theory of MacArthur and Wilson (1967) and the metapopulation theory by Levins (1969) were the source of inspiration when designing the Dutch ecological network. The construction of corridors and nature development areas and the conservation of existing nature reserves became the most important measures for the development of a new framework.

The development of an ecological network was closely related to ideas of landscape architects to separate user areas and a landscape framework, like was done in the study by Kerkstra and Vrijlandt when exploring solutions for the declining landscape characteristics on the sandy soils (Kerkstra and Vrijlandt, 1988). Both the ecological network concept and the casco model can be considered as networks of financial weak functions surrounded by financial strong agricultural user spaces. The difference between them is the scope: a multifunctional scope of the casco model and a monofunctional scope of the ecological network concept. Despite many similarities, landscape and nature policies ultimately became separated. Although a nature policy plan also describes the conservation of landscape values, different measures are applied to reach these goals. Landscape conservation strategies remain defensive and are initially based on conservation of areas instead of the development of a landscape framework.

The separation of policies for nature and landscape also appeared in the publication of the *Nota Landschap* (Land-

scape Policy Plan) shortly after the publication of the *Natuurbeleidsplan* (Nature Policy Plan). The *Nota Landschap* combines the landscape conservation described in the nature policy plan with the planned policy on landscape development. The government adopted the casco approach for the application of the landscape development objectives (Ministerie van Landbouw, 1992).

Nature reserve Blauwe Kamer

During 1992, *Plan Ooievaar* was brought in practice in the *Blauwe Kamer*, a river reserve along the Rhine between Wageningen and Rhenen. Different transformations are executed in the area: the digging of a secondary river bed, a lowering of the surface, the rising of small dikes and the construction of ponds. River dikes were removed to give the water more influence and space. A couple of years later, after the floodings of 1993 and 1995 there came more attention for the storing capacity of the river forelands. Water management became more important in the deliberation of foreland design. But also elsewhere the water guidelines became dominant as a result of the strategy to keep the water in the area and afterwards storing the water, before the dumping of the water.

New legislation

During the nineties the implementation of nature policies became better implemented in legislation nationally and internationally. The increasing international importance of biodiversity resounds in the UNEP Biodiversity convention, but also European policies were formulated. Next to the Birds Directive, which was founded

in 1978, the Habitat Directive was founded in 1992. Finally, both were integrated in Natura 2000, which imply a strict conservation of nationally allocated areas.

On the national level, the *Natuurbeschermingswet* (Nature Conservation Act) was updated in 1998. The new act regulates both the conservation of nature monuments and the areas indicated by the European Directive Natura 2000. From then, the act only regulates the conservation of areas and the *Flora- en Faunawet* (Flora and Fauna Act) regulates the conservation of species. All activities that are harmful for nature within the appointed areas need permission of the province or the minister of Agriculture, Nature and Food Quality. The act determines the writing of a management plan for all Natura 2000 areas. These plans mention which activities are allowed and which are not.

The Dutch *Flora- en Faunawet* (Flora and Fauna Act) combines the *Vogelwet* (Bird Act) from 1936 and the *Jachtwet* (Hunt Act) with the implementation of the species conservation regulations from the European Birds and Habitat Directives and the international agreements laying down in the CITES treaty. Activities with negative effects on protected species are not allowed, unless special requirements are taken into account.

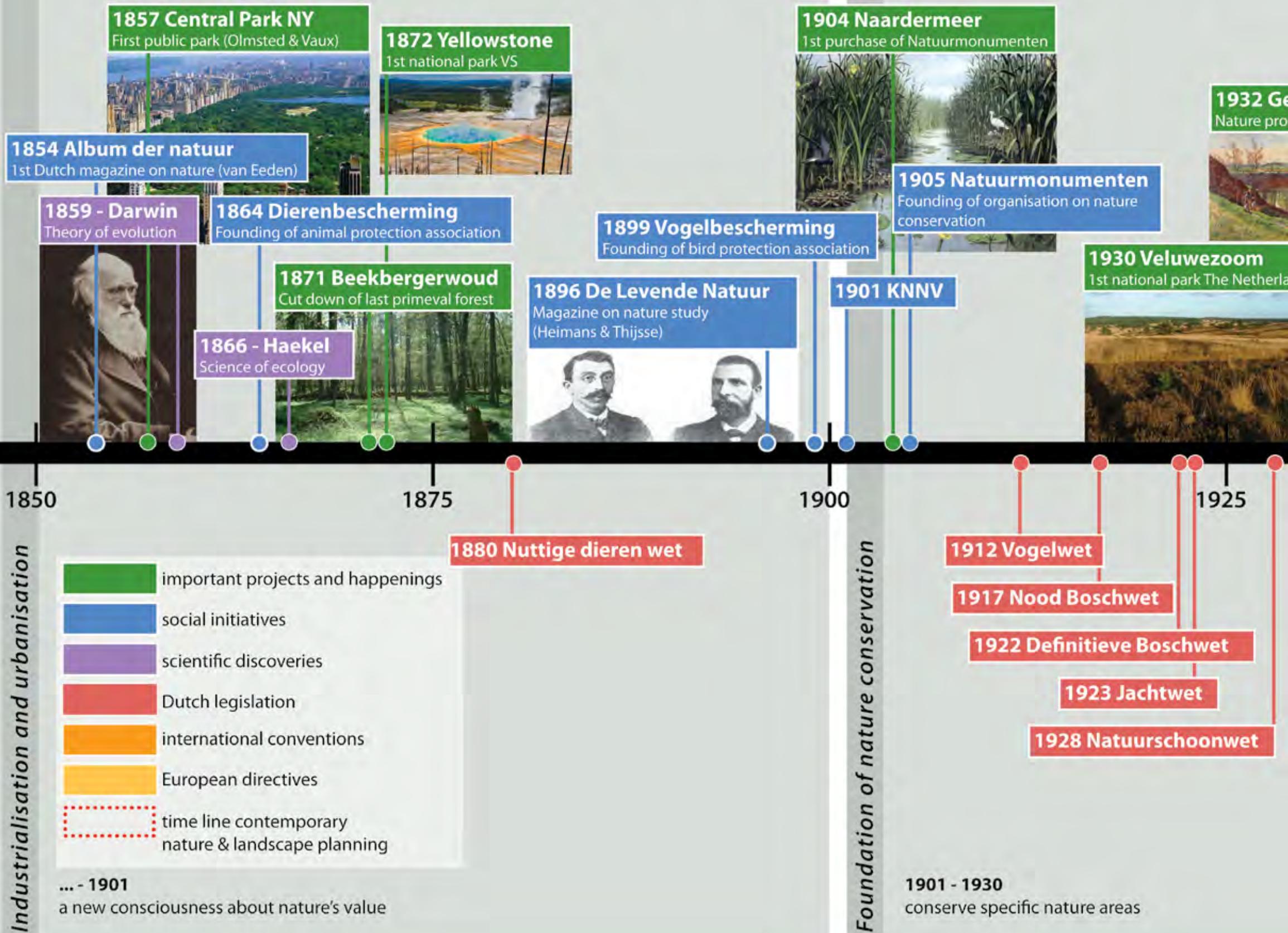


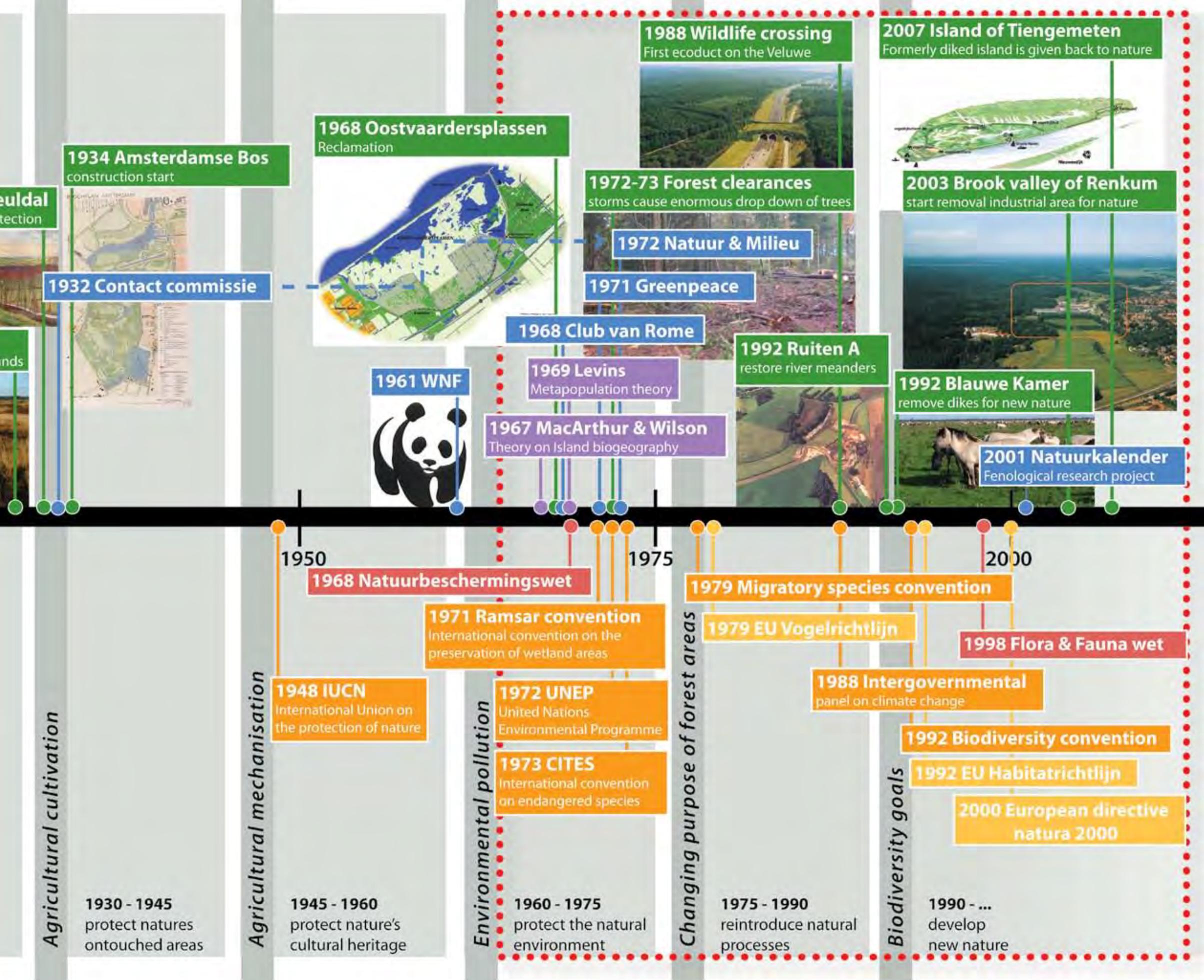
Blauwe Kamer (1992) dikes are removed to let river water inundate the land again. Wild horses are used to keep the area free from higher vegetation



Brook valley Renkum (2004) industrial area makes way for nature

150 years of Dutch nature conservation





1930-1945
Agricultural cultivation

1934 Amsterdamse Bos
construction start

1932 Contact commissie



1968 Oostvaardersplassen
Reclamation



1961 WNF



1968 Club van Rome

1969 Levins
Metapopulation theory

1967 MacArthur & Wilson
Theory on Island biogeography

1988 Wildlife crossing
First ecoduct on the Veluwe



1972-73 Forest clearances
storms cause enormous drop down of trees



1972 Natuur & Milieu

1971 Greenpeace

2007 Island of Tiengemeten
Formerly diked island is given back to nature



2003 Brook valley of Renkum
start removal industrial area for nature



1992 Ruiten A
restore river meanders



1992 Blauwe Kamer
remove dikes for new nature



2001 Natuurkalender
Phenological research project

1950

1968 Natuurbeschermingswet

1975

1979 Migratory species convention

2000

1998 Flora & Fauna wet

Agricultural mechanisation

1948 IUCN
International Union on the protection of nature

1945 - 1960
protect nature's cultural heritage

Environmental pollution

1972 UNEP
United Nations Environmental Programme

1973 CITES
International convention on endangered species

1960 - 1975
protect the natural environment

Changing purpose of forest areas

1979 EU Vogelrichtlijn

1975 - 1990
reintroduce natural processes

1988 Intergovernmental panel on climate change

Biodiversity goals

1992 Biodiversity convention

1992 EU Habitatrictlijn

2000 European directive natura 2000

1990 - ...
develop new nature

Agricultural cultivation

1930 - 1945
protect nature's untouched areas

3.2 Policy context of nature conservation

Biodiversity goals

In the forties, policies followed ideas of nature conservationists during the making of the first spatial policy for the Netherlands. The same happened during the seventies, when the government appointed reservation and maintenance areas, and during the nineties, when the government followed new ideas about nature development (see also the time line on contemporary Dutch nature and landscape planning at page 50).

Natuurbeleidsplan

The authors of the *Natuurbeleidsplan* (Nature Policy Plan) noticed that previous policies did not prevent a further decline of nature and landscape. Most problems mentioned by the policy plan do not concern landscape, but a decline of nature and especially biodiversity. However, the main purpose of the plan is the “sustainable conservation, restoration and development of both nature and landscape values” (Ministerie van Landbouw et al., 1990). These values were divided in ecologic, geologic, cultural historic, and experience values. Seven objectives were mentioned, which focused on: 1.) the conservation, restoration and development of nature in the allocated ecological network, 2.) the conservation of geological, cultural historical and experience values in areas with specific landscape qualities, and 3.) the conservation of biodiversity. For the first time in policies, nature and landscape were considered separately. While the national government became mostly concerned with ecological issues, landscape issues were delegated to regional agencies.

The implementation of the *Natuurbeleidsplan* was highly

dependent on old policy instruments, especially those introduced by the nature and landscape policies from 1975. New maintenance and reservation areas and the maintenance of landscape elements became important links in the planned ecological network. Furthermore, older policies were used to acquire existing nature areas. Finally, new instruments were designed for nature development. The advantage of this new instrument is that it is possible to acquire more land than the originally planned nature area, and that all acquired land can be transformed into nature areas (Ministerie van Landbouw et al., 1990).

Natuur voor mensen, mensen voor natuur

The most important change in these nature policies was described by the policy plan on nature, forests and landscape “*Natuur voor mensen, mensen voor natuur*” (Ministerie van Landbouw, 2000). Despite the increase of land occupied by nature areas in the years after 1990, the biodiversity still decreased. The new governmental policy plan related the limited success of the EHS to the limited spatial coherence between the nature areas. To tackle problems with spatial coherence - the supposed reason for the continuing decline of biodiversity -, the EHS was adapted to a renewed concept, rooted in the development of robust nature corridors (*robuuste verbinding-zones*). These super corridors met the intention to both enlarge and connect the nature areas at the same time. The latest policy document considering the EHS, an integral spatial strategy called *Nota Ruimte* (Ministerie van Volkshuisvesting, 2004), barely changed existing nature policies. Three different categories of nature emerge in

the spatial strategy. Firstly, there are nature areas determined by the European Birds and Habitats Directive, together *Natura 2000*. Secondly, the policy document mentions areas conserved by the *Natuuurbeschermingswet* (nature conservation act). Finally, the areas which belong to the national ecological network are mentioned, including robust nature corridors.

Renewed attention for the cultural landscape

Nota landschap

After many years of discussion between core ecologists and landscape people about the position of the cultural landscape, landscape obtained an independent position in policies since the *Nota Landschap* (Landscape Policy Plan) of 1992. Landscape policies were disconnected from nature conservation interests. Accordingly, new strategies could be used to reach landscape purposes. The government used a rather new policy style to implement landscape purposes. The *Structuurschema Groene Ruimte* introduced *Waardevolle Cultuurlandschappen* (valuable cultural landscapes). This policy approaches the conservation and development of areas with specific landscape qualities in an integral way. It was the first policy that consists of an integral, area specific approach. Central purposes of the policies were: decreasing the tension between nature and agriculture, searching for new economic stimuli and restoration of nature, landscape and environmental values, and reorientation of the agricultural sector (Ministerie van Landbouw, 1993).

Besides the attention for landscape purposes, cultural history became an important policy objective during the nineties. This was expressed in the *Nota Belvedere*, the policy plan for cultural history (Feddes and Compagnie, 1999). According to the policy plan, cultural history should be conserved by means of development. In general, this is applied by “*keeping cultural historical identity recognizable in the urban and rural area, both as a quality and as a starting point for further development*”. Moreover, specific rural areas are determined as belvedere areas, in which cultural historical identity will be intensified and utilized (Feddes and Compagnie, 1999).

Nationale landschappen

Cultural landscape and cultural history became the pillars of the *Nationale Landschappen* (national landscapes), which were described by the *Nota Ruimte*, the national spatial strategy (Ministerie van Volkshuisvesting, 2004). The policy plan integrated several spatial policies including nature policy plans, spatial planning strategies and landscape policies. ‘National landscapes’ replaced the ‘valuable cultural landscapes’, which were determined by earlier policies. Besides, most of the national landscapes covered belvedere areas. United Nations policies were implemented in the national strategy as well. A couple of areas and buildings were recorded on the international UNESCO list. Apart from ‘national landscapes’ and the UNESCO list, local authorities became responsible for general landscape values.

The increased importance of the culture landscape and cultural history in both society and policies is reflected in discussions about the reference point for the design of

new nature areas. The original ideal of untouched wilderness became contested. Although, it might be necessary to remove the upper layer of the soil to undo many years of fertilizing by agriculture, the cultural historical characteristics of the different landscapes are denied by a strict application of this ecological inspired design strategy (Van Toorn et al., 2000). The question that many pose is why we need to erase our cultural landscape while especially this cultural landscape used to be a very biologically diverse natural landscape for many centuries. This thought influenced many nature development projects, especially in the areas that are part of landscape policies.

A social perception of nature

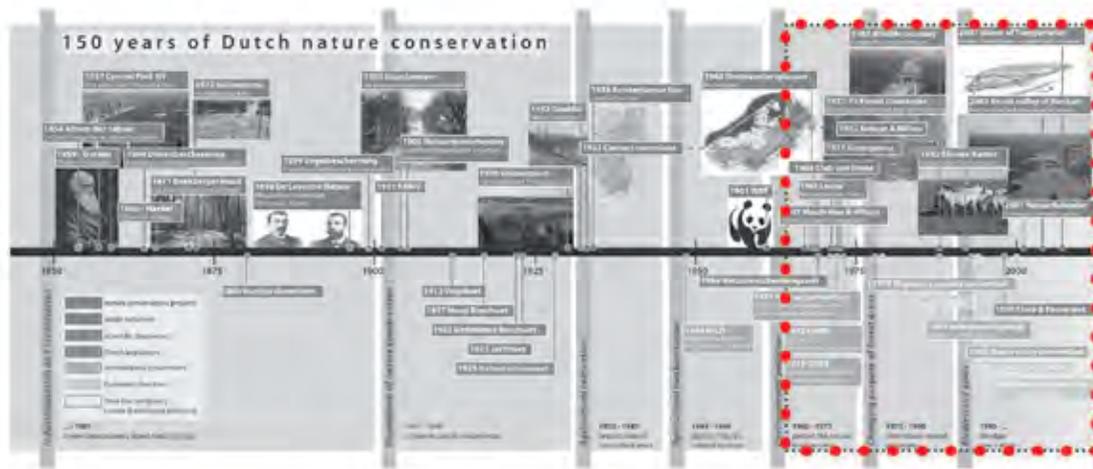
The policy plan on nature, forests, and landscape *Natuur voor mensen, mensen voor natuur* (Ministerie van Landbouw, 2000), is the successor of the nature policy plan of 1990. This new policy plan stands out by its functional nature approach (Tromp, 2001). Important objectives of the policy plan are terms like experience, diversity and usefulness. The main purpose of the plan is the “*conservation, restoration, development and sustainable use of nature and landscape as essential contribution to a liveable and sustainable society*” (Ministerie van Landbouw, 2000: 3). Although the nature policy plan from 1990 claimed to combine different nature views, the plan shows a rather landscape ecological view characterised by a central position of intrinsic values of nature and species. The value of nature in the new policy is dependent on the use by people (Tromp, 2001: 105).

Natuur voor mensen, mensen voor natuur implies a broadening of nature policies. Different ambitions for nature, landscape, forests and biodiversity in the 21st century were increased by the new policy, but were not integrated in most cases. The governmental strategy separated the measures for the improvement of biodiversity from the measures to improve the availability of nature for people. Therefore, two types of nature were distinguished: nature within the ecological network and nature outside the ecological network. Accordingly, the ecological network concept itself did not necessarily get a more social perspective. This appears in the description of five different perspectives for the Netherlands. Most perspectives focus on a strengthened nature and biodiversity (1, 2 and 3), while others deal with landscape and forests (4 and 5).

Concerning nature outside the ecological network, the new strategy recognizes an increasing fragmentation of the landscape and problems related to the availability of nature for people. The latter was strengthened by green-blue lining through the rural areas and recreational nature around cities, which should provide in nature for the people.

The policy plan *Natuur voor mensen, mensen voor natuur* turned out to be a preparation on the national spatial strategy, the *Nota Ruimte* (Ministerie van Volkshuisvesting, 2004). The spatial strategy distinguishes natural values, landscape qualities and special landscape and cultural historical values. The separation between nature and landscape policies is strengthened and can be seen as a continuation of a strict separation between nature and culture.

Contemporary



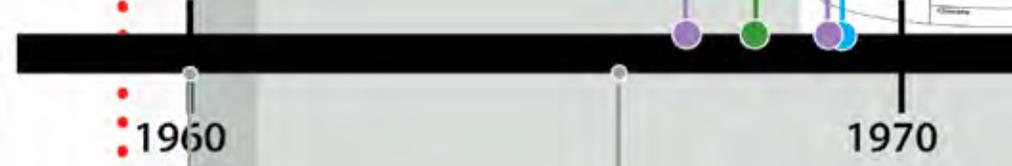
1968 Oostvaardersplassen
Reclamation



1969 McHarg
Publication Design

1969 Levins
Metapopulation theory

1967 MacArthur & Wilson
Theory on Island biogeography



1960 1e nota R.O.

1966 2e nota R.O.

Environmental pollution

1960 - 1975
protect the natural environment

- important projects and happenings
- spatial concepts on nature
- scientific discoveries
- policy documents on nature
- policy documents on landscape
- policy documents on spatial planning
- time line contemporary nature & landscape planning

Dutch nature & landscape planning

1972-73 Forest clearances
storms cause enormous drop down of trees



1979 Design with Nature



1988 Wildlife crossing
First ecoduct on the Veluwe



1992 Blauwe Kamer
remove dikes for new nature



1992 Ruiten A
restore river meanders



1990 EHS - concept
national ecological networks



2007 Island of Tiengemeten
Formerly diked island is given back to nature



1987 Casco-Concept
sandy landscapes



1986 Plan Ooievaar
river landscapes



2003 Brook valley of Renkum
start removal industrial area for nature



1974 3e nota R.O.

1975 Relatienota

Changing purpose of forest areas

1976 Verstedelijkingsnota

1980

1988 4e nota R.O.

1990

1990 Natuurbeleidsplan

1991 Nota Landschap

1992 4e nota R.O. Extra

1995 Visie stadslandschappen

2000

2001 5e nota R.O.

1999 Nota Belvedere

2000 Natuur voor mensen, Mensen voor natuur

Biodiversity goals

1990 - ...
develop
new nature

2004 Nota Ruimte

1975 - 1990
reintroduce natural
processes

3.3 Reflections

The debate about separation and intertwining ended in a choice for separation, because it was in the interest of both agricultural people and nature conservationists. Remarkably, environmental problems were one of the major reasons for the choice for separation, although originally environmental people advocated intertwining with the idea that all agriculture should make a shift to more organic methods. At the end of the eighties however, environmental problems were considered to be part of modern agriculture and the only way to deal with it was decreasing the influence of agriculture on natural systems. Agriculture benefits as well from this approach because they were not bothered with environmental issues. With hindsight, this benefit was temporal; at the same time environmental policies became more rigorous resulting in more environmentally sustainable agriculture.

Failing landscape policies

The *Natuurbeleidsplan* (nature policy plan) regulated the development of an ecological network in the Netherlands. Despite the priority of social use of nature in the later policy plan about nature, forests, and landscapes “Natuur voor mensen, mensen voor natuur”, these thoughts were not implemented in the ecological network concept. The integral policy was executed by different objective focused spatial concepts. The social objectives were for example realized by the development of recreational nature close to cities.

Landscape policies were split of from nature policies because the differences between landscape objectives and

nature objectives were increasing. The conception of cultural landscapes was very different from the wilderness discourse where nature conservationists aimed for. Besides, cultural landscapes and ecological networks were many times located in different areas, while the shape of ecological networks did not correspond with the shape of the cultural landscapes. Although the casco model can be considered to be a possibility to incorporate ecological networks, the financial base of the policy was weak and the feasibility of the idea rather difficult. Finally, landscape did not benefit from a separation of areas with and without nature which tend to happen with application of the ecological network concept. The ecological network idea was influential, because there were finances and political priority. The casco model was not as influential, while a combination of ecological network and casco could only be successful if the ecological network was incorporated in the casco.

Landscape policy also changed last years. Due to the increasing importance of cultural history, the interest shifted from natural landscapes to cultural landscapes. Accordingly, the casco model is not the right answer to landscape objectives anymore. Moreover, as mentioned before, environmental problems decreased as a result of the rigorous environmental policies. In sum, both problems and objectives changed since the early nineties.

Two discussions

Concerning our study, we think it is important to notice that we enter in two older debates. Firstly, we enter in the debate within the nature conservation movement

about the definition of nature. This debate happens between landscape people, represented by urbanists, planners, recreational people and cultural historians, and biologists and ecologists. Secondly, we enter in the debate about the choice between separation and intertwining which grounds in the sixties when nature conservationists and the environmental movement meet each other.



Design philosophy 4

Nature planning from a landscape perspective

Introduction

In the course of centuries meanings of nature changed a lot. Perception and appreciation of nature is closely related to people's individual understanding and cultural background. Interpretations of nature determined the park and garden design and returns in paintings. Later, conservation of nature arose from people's experience of nature. In recent years, a new era has been started with the development of 'new nature' and again our culture determines the interpretation of nature.

Contrarily to former times, our present culture is knows multiple meanings of nature. How can we deal with multiple meanings of nature? Is it possible to reckon with different interpretations at the same time?

Chapter three already illustrated different movements in nature conservation. Also, it became clear that meanings of nature affect preferred aesthetics of nature and landscape policies. Moreover, nature and landscape policies were separated because of different priorities given to meanings of nature.

This chapter aims to address meanings of nature and landscape and to search for a design philosophy that meets today's meaning of nature.

We depart with an analysis of meanings of nature in former time and search for contemporary meanings. Also, we try to relate meanings of nature with aesthetics. Next to that, we evaluate different concepts for nature planning and reflect on how strategies that are in force now fulfil meanings of nature in society.



What is nature?

The meaning of nature

Nature's definition is broad and one of the most complex words in languages. The word itself implies a singular meaning or quality, whereas it covers a real multiplicity of things and phenomena that we see in reality. Nature can be a mountain range or primeval forest, or closer to home the neighbourhood park or cows grazing the meadows. For some it is even likely to consider houseplants or weeds between the pavements.

Nature as a cultural construct

Looking at the very original meaning, in Latin as well as in English the word described a quality, the essential or given character of something. For example the phrase 'it's in the nature of humans' points at people's behavior in certain situations.

Besides, Williams (1983) mentions two additional meanings that are useful for this thesis (Johnson and Hill, 2002). One meaning we describe as the forces that direct the world, humans included. Like for example water flows and nutrient trade-offs, or the climate and whether conditions directing the existence of species. Ultimately, it can describe the working of for example indigenous forest ecosystems. In short, this meaning encompasses all the living and non-living processes.

The other meaning we describe as the physical world itself directed by those processes. It describes the state of all living and non living things, either with or without humans, for example the species itself, soils and landform, and finally the appearance of ecosystems.

Considering the above mentioned, nature is analogous to the physical environment. Its functioning can

be described by its processes and distinctive physical characteristics. As nature is a description of the physical world, the question that rises is how mankind relates. In defining this relation, it should be remembered that nature's definition is a product of culture. Nature does not know itself as nature. Meanings given to nature are always inspired by people's beliefs of what nature should be. According to Spirn (2002), it seems that ideas about nature tell even more about the organization and functioning of our society than they do about natural processes and characteristics (Johnson and Hill, 2002).

Nature, landscape and city

Nature is closely related to landscape. There does not necessarily need to be a difference between the description of nature and landscape since they largely review the same reality. This explains why people often interchange the words nature and landscape while talking about the same environment they like or dislike. Spirn mentions that for landscape planners and designers it means that it is impossible to make a landscape without expressing their (unconscious) ideas about nature (Johnson and Hill, 2002).

In today's urbanized society, there seems to be a clear distinction between nature and / or rural landscapes on one side and city on the other side. This distinction makes clear that our view on nature can be regarded as urban, since the concept of nature does not exist without the city as its counterpart. An urban perception approaches nature as beautiful, pleasure and with a clear moral, something that should be treated with respect. Accord-

ing to Van der Windt and Feddes, urban people consume and nourish nature as an extension of their backyard. In contradiction to the agricultural perception, which rather exploits than consumes nature, the image and use of our nature areas counterbalances the urban life (Feddes et al., 1998).

Nature, landscape and natural landscape

It is often said that nature is something that needs to be protected. In our society the meaning of nature is defined by relating it to some kind of protection, in which preferably little human interference is involved. This is reflected in definitions used in nature protection policies. Many times, different categories are distinguished in which the degree of human involvement differs. Policies mention semi-natural landscapes, maintained natural landscapes etc.

Considering different meanings given to the terms nature and landscape and trade-offs between them, a definition of nature also has implications for its position in landscape. Especially in a country like the Netherlands this is of major importance, because here original natural landscapes are completely transformed and replaced by cultural landscape forms. In response to this situation, questions rise whether there are natural landscapes or is pure nature left. These questions resulted in a lot of argument about how to define nature, landscape and natural landscapes, especially since new nature policies became operative. Many discussions on these topics ground in different beliefs of what kind of nature should be protected and developed and how this relates to the surrounding landscape.

Paradigms on nature

As products of our culture, meanings of nature vary between people, place and period. The same counts for the meaning of landscape. Throughout history, our understanding was dependant on society, political situation and religion. Changes of thought were influenced by gained knowledge and new insights in the relation between man, environment and universe. In Western culture, we distinguish several periods of time in which the relation between man and nature greatly differs.

According to Rientjes (2002), three time periods reflect people's different relation with nature; an organic, a mechanic and an ecological paradigm on nature.

The organic paradigm

For the greater part of human history, people had to defend themselves against nature. Up to and including the Middle Ages there was both a fear of its physical and spiritual phenomena and a respect of its moral and religious dictation. Due to the little understanding of natural phenomena in general, the world was seen as an active organism or animal, being the language of God. This is called the organic view. Social arrangements and conventions were viewed as if they were natural, and were easily taken for granted. According to Burke, this is expressed in the position of the king who is often described as the sun of the social cosmos and the personification of God the creator himself (Teich et al., 1997).

The mechanic paradigm

In the course of the 17th century, roughly from Renaissance onwards, people's view on nature changed radically. This was mostly inspired by a complex of changes named as the 'scientific revolution'. The organic metaphor that persisted in the Middle Ages was replaced by a mechanic view of the world. No longer were nature and society integrated parts of creation. According to Burke, there was drawn a clear boundary between nature and society, the latter obviously inspired by scientific revelations and the former becoming the passive body of science (Teich et al., 1997).

By the time fear and respect of natural phenomena diminished, nature became more a device and functions for the benefits of human use. Generally, nature has a meaning as resource or obstacle to economic development. Today's interpretation of man against nature is rooted in this particular conception of the mechanical view, which imposes that its man's duty to fight and conquer nature for the benefit of human civilization (Van der Windt et al., 2007).

Parallel to the meaning of nature as a resource, two opposite meanings emerged. The Arcadian meaning focuses on the human care for nature, and the accompanying emotional and aesthetic enjoyment. This conception of the mechanical view finally became the fundamental idea of the Romantic Movement in arts and architecture in the 18th century. Initially, Romanticism looked at nature as 'innocent', 'good', 'pure' and 'healing'. However, while developing, the movement started to distrust nature and viewed it more as being a wilderness that is 'untamed', 'demonic' and 'wild'. This

meaning led to human attempts to improve nature by science and technology, and ultimately the belief that nature can be managed and preserved.

The ecological paradigm

In recent decades, there has been a striking turnover which undermines the classical, mechanistic distinction between man and nature. From now on, the world is seen in an ecological way. This can be addressed to four developments: (1) the development of ecology as a science, (2) a growing social concern and interest in nature as a good, (3) environmental problems and (4) the understanding of the consequences of technological development. In response, ecological consciousness becomes a target point in western society. It refers to ecological qualities as a means to improve the living conditions of people. Nature is no longer solely a matter of the living elements of the biosphere, but also includes the biosphere's physical and chemical parameters. Also human beings are regarded to be part of and fully involved in natural phenomena. In this way, the meaning of nature expands itself to the entire environment and receives a holistic significance.

Aesthetics of nature

Paradigms of nature are related to the image people have of what should look like and how they appreciate it. Although aesthetics are not necessarily bound to certain paradigms, there appear to be some remarkable parallels.



Arcadian aesthetics of nature
Stour valley and Dedham Church; John Constable (1814-15)

Aesthetics of nature from a historical perspective

For the greater part of western modern history, the mechanic paradigm determined our relation with nature. During the time the mechanic paradigm was leading, people made huge steps in their understanding of the world. People's distancing from the natural world made it possible to appreciate rather than fear natural threats.

The three meanings that are given to nature (the func-

tional, the Arcadian and the wilderness) have in common that they all express what is ought to be beautiful. In other words, the given meaning includes a certain aesthetic image of nature. To describe and depict nature it was connected to the appreciation of art and therefore closely related to architecture, garden design, sculpture and painting.

The functional meaning of nature has got a strong anthropocentric perspective, in which nature is made suitable for human exploitation. Qualities are described in

terms of economics. It functions as a resource for all kind of materials. Aesthetics that represent its functional meaning are large scale forestry and agricultural production. The Arcadian meaning of nature is strongly influenced by landscape painting in the 18th century. Especially the Romantic Movement contributed a lot to Arcadian aesthetics. Landscape painters like for example Constable sought to depict the agricultural idyllic countryside and show nature's harmony. His paintings represent a semi natural landscape in which human influence is visible by the working of the land. Although the framing of his scenes seem to be randomly taken, they are in fact carefully arranged. The Arcadian image is also reflected in many park designs in the *English Landscape style*. Parks and gardens of wealthy people were designed as if it were a traditional English countryside. Also here a typical arrangement of clumps, ponds and lawns shows that the Arcadian image of nature is based on framed scenery, which the visitor experiences by unexpected views while walking curving paths.

Nature as a wilderness emerged next to the Arcadian meaning of nature. Not all nature was like the Arcadian image. By that time, more remote and wild areas were explored as well and wilderness got a different meaning. Traditionally, wilderness means the natural environment that has not been changed by human intervention. It was seen as a feared place like in the organic paradigm during Middle Ages, when people were afraid to leave the civilized areas and enter dark and mysterious forests. The wilderness image of nature however



Wilderness aesthetics of nature
Kreidefelsen auf Rügen; Caspar David Friedrich (1818)

wonders instead of fears untamed and wild nature. Influenced by the Enlightenment, left uncivilized areas like mountain ranges were explored and enjoyed, mainly for recreational purposes. Again here we find a parallel in landscape painting. The German artist Friedrich is one of the finest examples of a painter who paints the natural landscape as a wilderness. His paintings many times show back figures, looking and wondering, but also enjoying the mighty scene unravelling in front of them.

Out of the wilderness meaning of nature, the first initiatives on nature preservation arose in the United States of America. From this perspective, they established their first national parks of which Yellowstone was the first in 1872. In Europe, the concept of nature preservation emerges some years later. In the Netherlands, the first nature area that is preserved is the Naardermeer (Lake of Naarden). Although it is called a lake, the area has been reclaimed and cultivated in the past. Once it flooded again it has never been pumped dry (Reh et al., 2005). As a result of this history, former cultivation patterns are visible in the field. This example shows that the Naardermeer initially never was a pure wilderness but always knew human intervention. In this regard, for the Netherlands it is hard to say that nature preservation originated from a wilderness perspective. Although in case of the Naardermeer some people hold on to the wilderness belief, the actual image of the Naardermeer even after hundred years of human refrain shows no true wilderness. Considering the fact that all nature in the Netherlands is created in manmade landscapes, it is more likely to say that Dutch nature carries an Arcadian

image. This is also recognized by Natuurmonumenten, the main foundation on the protection of nature areas, who hold the belief that their nature areas many times reflect the agricultural landscape of the 19th century.

Contemporary aesthetics of nature

The ecological paradigm is directing our contemporary understanding of nature. Now we have reviewed past images of nature and how they are related to a certain way of seeing man's relation to the physical environment (the mechanic paradigm), it seems reasonable to ask the same question for the ecological paradigm. What should nature look like considering the belief that the relation man-nature has changed during the past decades?

Since the science of ecology has been developed for the last hundred years, the way experts look at nature changed considerably. Nature is no longer solely seen in relation to the aesthetic appreciation or in relation to species of flora and fauna. The importance of nature's image has diminished and is replaced by a more ecological approach that looks at nature in terms of ecosystems and mutual relations between organisms and nutrient flows. The focus is on processes of nature, instead of its visible image and individual species.

The ecological paradigm has also entered Dutch nature policies. Since the release of the Natuurbeleidsplan in 1990, policies reveal a special care for ecosystems and their biodiversity, but also less care for landscape aesthetics.

Newly developed nature areas are measured by biodi-

versity. Afterwards, aesthetics are taken into account. Sometimes old principles are applied and a nature area is designed with for example a wilderness image in mind, but always with the initial ecological requirements in mind.



Initial reclamation plan of Naardermeer, after N. Bonifatium in 1629
Source: Reh et al (2005)



Naardermeer in present times, transformed from a geometrically designed polder into a man-made wilderness.

4.2 The ecological paradigm

In previous paragraphs, we explained that meanings of nature are created by society. The existence of different paradigms and aesthetics of nature is a clear example of the fact that nature is a cultural construct. The difference between notions of landscape and nature appears to be vague, which shows that also the landscape is involved.

This paragraph elaborates on the development of the ecological paradigm by going back to its roots: the science of ecology.

Historical shifts

The word 'ecology' is derived from the Greek words 'oikos', meaning household, and 'logos', meaning wisdom or knowledge (Johnson and Hill, 2002). The first modern interpretation of ecology however is rooted in the science of plant ecology and emerged just before the start of the twentieth century. At this time, botanists understood that (Cook, 2000 p. 118):

"For any location, there was a recognizable sequence of plants that invaded a site following a severe disturbance, such as fire or land clearing for agriculture. The sequence of species that appeared in stages usually ended with a community composition similar to that before the disturbance, a process called succession".

In the thirties of the twentieth century, the interpretation of ecology expands to include animal inhabitants too. However, more important is a re-describing of the paradigm in terms of two fundamental processes directing the 'ecosystem': the flow of energy through the community and the cycling of non-organic elements like hy-

drogen, oxygen, nitrogen, and carbon (Cook, 2000 p. 119). This interpretation of ecology is also called the 'equilibrium paradigm', and is characterized as a closed, self-regulating system, being in balance or equilibrium in its most mature state. Disturbing forces like natural disasters are external to the system. Most significant however is that activities of humans are no part of the natural world and are considered to affect the ecosystem in a negative way.

In the 1980s, a new interpretation emerged, called 'non-equilibrium' or 'holistic'. In contrast, this interpretation is inclusive. Disturbances whether natural or 'artificially' by humans, are intrinsic characteristics of the ecosystem. With humanity as an equal part of the system, this new interpretation challenges a distinction between culture and nature (Cook, 2000). With this conception of ecology and ecosystems, the non-equilibrium demonstrates itself in a holistic way. It considers being a framework for un-

derstanding the environment, or as a metaphor or philosophical ground for living (Johnson and Hill, 2002). In essence, it focuses on processes and dynamics, rather than the states and structures of the equilibrium system (Pickett et al, 2004).

Current nature conservation and meaning of nature in the Netherlands balances between new interpretations of mechanistic views on nature (wilderness, arcadian and functional), eco-technological approaches in scientific terms (landscape processes), a holistic approach of nature among philosophers, and multiple meanings of nature in society.

The rise of landscape ecology

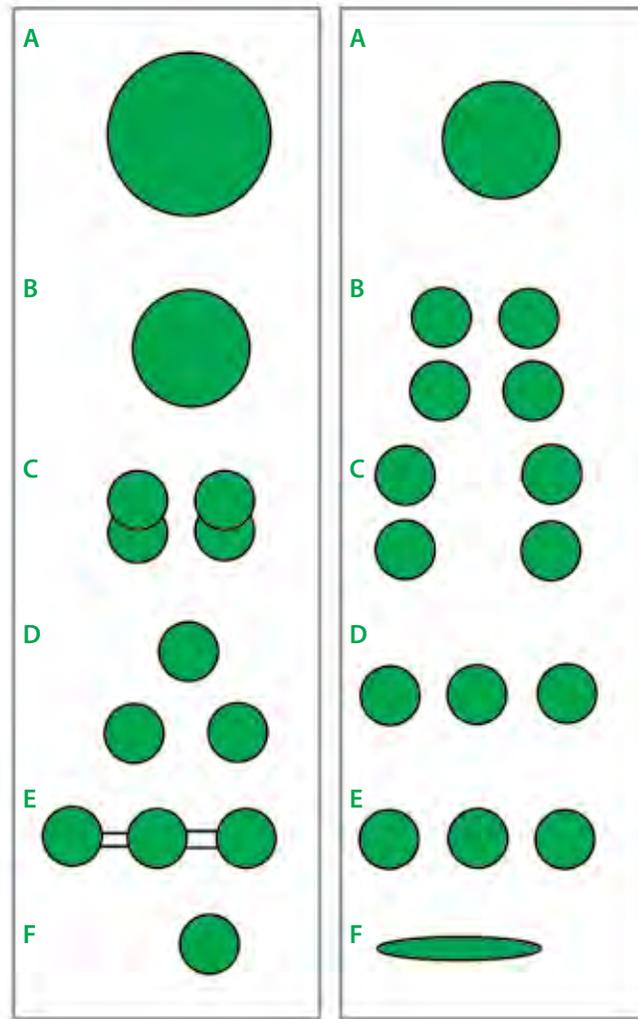
In the second part of the 20th century, landscape ecology becomes an independent discipline. Landscape ecology

Equilibrium approach	Holistic approach
Closed self-regulating ecological systems	Open and dynamic ecological systems
Disturbances are excluded from the system	Disturbances are included in the system
Succession stages are predictable	Succession stages are less predictable and greatly influenced
Humans are not part of the system	Humans can be and usually must be part of the system
A mature system is in balance or equilibrium	A system often suffers from disturbances and is a constant non-equilibrium

Different approaches of the ecological paradigm

Better

Worse



Metapopulation theory by Levins (1968)
source: Reed (2002)

- A. Bigger better than smaller
- B. Intact better than fragmented
- C. Close better than isolated
- D. Clumped better than liner
- E. Connected with corridors better than not connected
- F. Round better than any other shape

studies the biological processes on communities, landscapes and ecosystems. Two theories are important for the development of the discipline: the island theory by McArthur and Wilson (MacArthur and Wilson, 1967) and the metapopulation theory (Levins, 1968). Together these theories are the origin of thinking in ecological networks. This thinking is based on the knowledge that different populations have extinction chances dependent of the quality and the size of the habitat, migration, and birth and death rates. If exchange is possible, different populations belong together to a metapopulation. Accordingly, after extinction of one population, individuals of other populations can occupy the habitat again. Last decades, landscape ecologists focus on the management of spatial heterogeneity, based on knowledge about the dependence of plants and animals on specific conditions. Heterogeneity is the result of structure and pattern. Disturbance and fragmentation affects the spatial heterogeneity and therefore biodiversity. Up to recent research, there are four strategies to improve the stability of (meta)populations and as a result biodiversity: improving the quality of habitats, increasing the size of the ecological network, making the network denser (connect), and making non-nature areas more permeable (Opdam et al., 2003).

Regarding the increasing social value of nature and especially the thinking about nature as the opposite of culture, landscape ecological theory became an important building block for Dutch nature policies. Knowledge about the declining nature quality and quantity was used for an offensive strategy to challenge this development.

Aesthetics of the ecological paradigm

The ecological paradigm is reflected in a changed preferred aesthetics of nature, at least for those involved in nature conservation.

Technological nature

Mechanistic views on nature have been replaced by ecological thinking, which emphasizes the process of ecology more than aesthetic appearances. Increasing knowledge about landscape processes resulted in a technological approach to nature. New wilderness areas were not threatening anymore, but the result of ecological engineering. The spontaneous development of nature in the Oostvaardersplassen became an eye-opener. People turned out to be able to create conditions for natural processes and aesthetics were less important as long as natural processes could do their job. Therefore the aesthetics of nature most times are determined by a combination of landscape technology and restrictions or requirements imposed by other interests.

Interactive nature

On the other hand, nature is considered to be everywhere. Domestic cows in a meadow with very few grass species, birds in the back yard, houseplants in the windowsill and rough mountainous landscapes all became nature. Nature in this sense could be technological nature by ecological engineers, but also allotment gardens along a railway. Humans were included in this broad and divers meaning of nature and resulted in a new interpre-

tation of functional nature. This nature was considered to be interactive. Every meaning of nature became connected to human interests, multiple cultural constructs and different values. Like cultural landscapes, which are in danger to become less functional, interactive nature areas are not in the interest of ecological engineers. However, they receive increasing appreciation by people because of their historical value and local diversity.

Two images of the ecological paradigm

The ecological paradigm has two faces. The image of the equilibrium approach appears in the new nature areas which are inspired on landscape ecological sciences. These are the result of technological nature policies. The image of the holistic approach has innumerable appearances. It is a sum of multiple expressions and interpretations, in which natural expressions are considered to be part of cultural expressions. Besides, the multiple images of the holistic approach include new nature areas as well.

Question is therefore not which aesthetics of nature are the right one, but how nature policies can give space to multiple images of nature within an holistic approach of the ecological paradigm. In contrast to a narrow biodiversity perspective on nature, a landscape perspective does not give a one-sided ideal for nature development and offers solutions to give space to different use, values and interests.



Technological nature; (new) nature areas inspired on landscape ecological science (nature reserve Blauwe Kamer)



Interactive nature; nature is everywhere (allotment gardens north of Bodegraven)

Towards a new philosophy on the appearance of nature

In the context of Dutch nature conservation, the ecological paradigm is determined by a focus on ecological engineering. Till now, there is less attention for the appearance of nature. Concerning different meanings of nature, we believe that a holistic approach of the ecological paradigm asks for considerations on design as long as the government take responsibility for nature planning. These can be found by consciously relating scientific ecological issues with landscape considerations and people's desired use of nature.

Man-made landscapes

Considerations on the image of nature should reckon with the involvement of a manmade landscape and its relation with ecological qualities. We recognize different (post)modern interpretations of 'old' mechanistic views of nature. Purely untouched natural areas in civilized areas do not exist anymore. Wilderness images of nature of course can be found in some left remote areas like the Amazon forests, mountain ranges and polar landscapes, but they have no single relation with human occupation. On the other hand, nature as a resource, the functional image of nature, is also likely to continue to exist. Nevertheless, many urbanized areas in the world ask for a fairer approach. Ecological qualities here should not be exploited but nourished and even strengthened as a means to improve the living conditions of people. Finally, the Arcadian image of nature gets a continuation in a cultural historical approach to nature and in landscape ro-

manticism. Metropolitan landscapes might contain valuable cultural landscapes, but above all inhabit a lot of other expressions of human occupation, like infrastructure networks and industrial areas.

Images of the ecological paradigm should take into account all aspects of the metropolitan landscape. Many developments take place in those landscapes, ranging from sub urbanization and recreational 'consumption', to mobilisation and industrialization. The development of nature should be seen in relation to these different uses. Creating 'nature' is just like the other developments one of the phenomena of our urbanized society.

Concerning our search for a design philosophy on nature, some points can be made:

- Nature above all is a social and cultural construct, directed by the science of ecology
- Nature conservation and especially new nature are human expressions in the environment
- Ideally, nature policies give space to innumerable images of nature in the holistic approach of the ecological paradigm.
- By making 'landscape' in stead of 'biodiversity' the central concept, this ideal can be approached.

Now we have identified nature's position in the ecological paradigm and its relation with the metropolitan landscape, we can have a closer look at what should be the appearance of nature in the Netherlands. Important here is to recognize the landscape as being the unifying medium for different images of the ecological paradigm.



Is this nature?
Agricultural land (Polder Groot-Mijdrecht)



Is this nature?
Former agricultural land as 'new nature' (Waverhoek, Polder Groot-Mijdrecht)



Is this nature?
Former agricultural land promoted as 'living in nature' (The bovenlanden)

4.3 Concepts for nature planning

This paragraph searches for possibilities to implement a holistic approach of the ecological paradigm in planning strategies.

Various authors wrote about strategies for nature planning and design. Chapter 2 mentioned already typical landscape approaches (historical, spatial and mental) which are not only a way of thinking about landscape, but even more strategies for planning and design of landscapes. Apart from these models, different practical landscape concepts for planning of ecology have been developed. In this paragraph, we review approaches that affected the planning of nature areas in the past, but which also offer insight in possibilities to 'reinvent' an new approach for the development of nature areas from a landscape perspective.

We consider three different strategies to deal with nature. They have in common that they approach nature spatially and most times in relation to different land use. In fact, the ecological network concept is one of them, and therefore we start to consider nature from this ecological perspective (matrix strategy). Afterwards, different dynamics of land use will be discussed and finally landscape as a mosaic.

Ecological networks

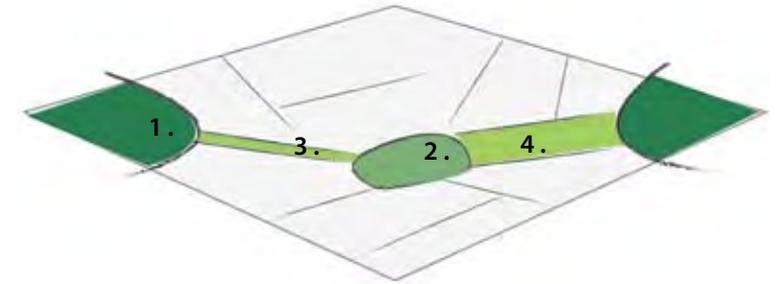
Plans for the Dutch ecological network are mainly an exponent of the science of landscape ecology. The concept focuses on the restoration of ecological processes and correspondingly with eco-technological thinking. Although since the publication of the policy plan for forests, nature and landscape in 2000, a more functional

and multiform view is rising, the ecological network concept remains to be eco-technological.

The ecological network concept is an interpretation of the island theory (MacArthur and Wilson, 1967) and the metapopulation theory (Levins, 1968). The island theory describes populations on islands as a result of birth, mortality and migration. The metapopulation theory abstracts the island theory by application on populations in general. The metapopulation theory considers different populations as one metapopulation if migration is possible. In that case, some populations might be too small to be viable, while others can form a metapopulation. Correspondingly, the ecological network concept is based on the idea of increasing biodiversity by connecting and increasing nature areas. The network concept therefore provides isolated nature areas with nature corridors to adjacent nature areas while in between nature development areas are located. Robust corridors are large corridors connecting mostly large areas of one ecosystem with each other. The network concept does not reckon with the space outside the concept. However, surroundings affect the network and therefore these influences have to be minimized to reach ecological goals. The meaning of nature is very strongly related to the ecological value in this concept.

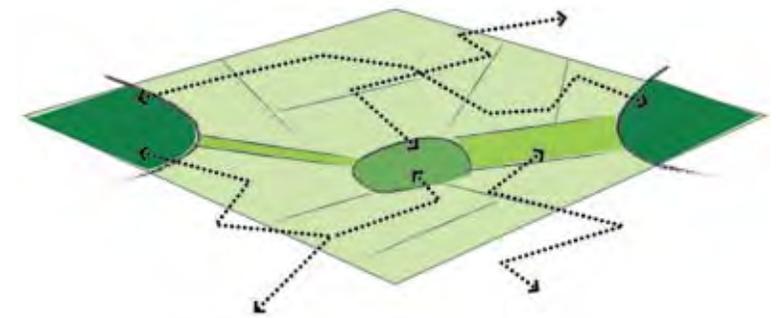
Thinking in matrices

In contrast to original network thinking, recent landscape ecological knowledge appoints areas in between nature areas and corridors as part of ecological network

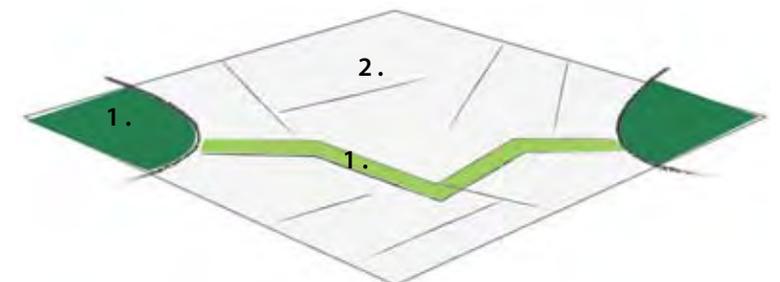


Design tools for the ecological network concept
The grey area is not part of the network

1. Nature key area
2. Nature development area
3. Nature corridor
4. Robust nature corridor

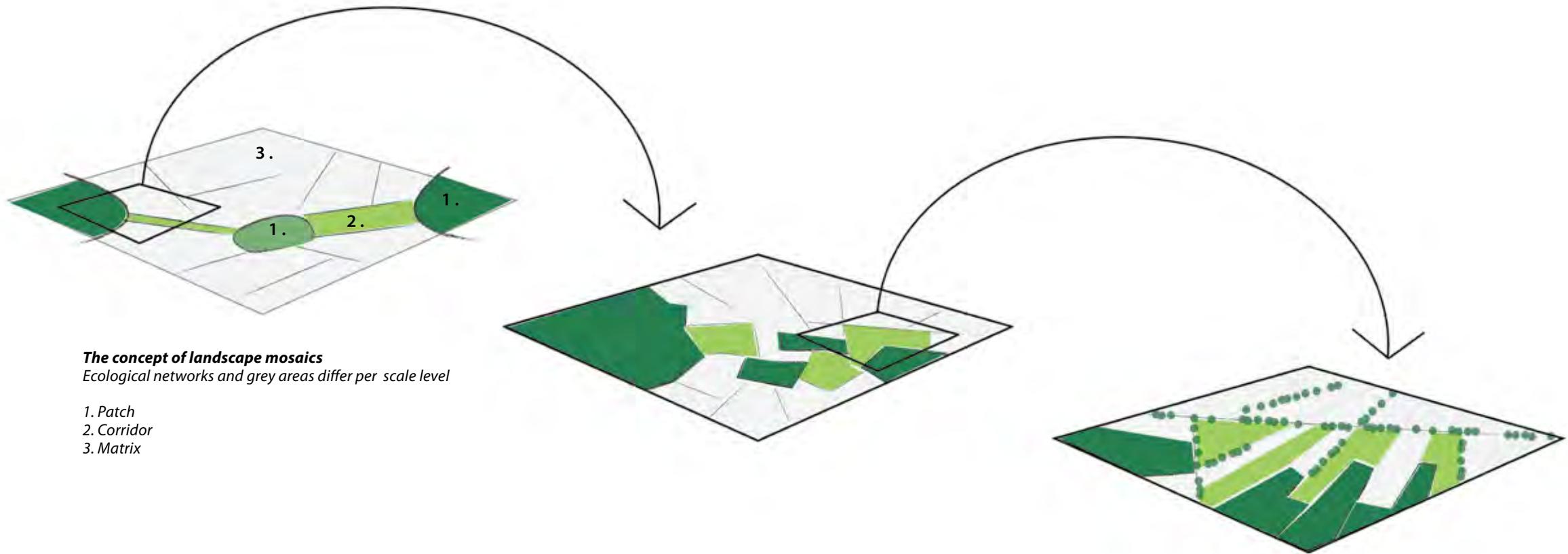


The ecological network concept with matrix
The grey area (matrix) is part of the network and is permeable for species



The casco model
The grey area is part of the model but does not have significant ecological values

1. Framework
2. In between space



thinking. These in-between-areas are indicated with the term 'matrix'. The introduction of matrix in landscape ecological theory can have many consequences for the design of ecological networks. This is reflected in the following design strategies for ecological networks.

Ahern et al. mentions three types of linkages: by habitat corridors, by stepping stones, and by habitat mosaics. The latter consists of places "where the different states of vegetations are not well-defined and there is a blending along the edges" (Ahern et al., 2006). These three spatial strategies are related to four ecological strategies presented by Dutch landscape ecologists (Opdam et al., 2003). They reason that biodiversity depends on two aspects of the ecosystem network: carrying capacity and connectivity. Two strategies are mentioned to strengthen the carrying capacity: increasing the size of the network and increasing the quality of the network. Connec-

tivity can be strengthened by increasing the spatial coherence of the network and by increasing the permeability of the matrix.

Two dynamics

Landscape architects developed a different, multifunctional strategy: the casco model (Kerkstra and Vrijlandt, 1988). This model is based on a spatial separation of high and low dynamic functions. The framework of the landscape is generated by a low dynamic casco which contains nature areas, cultural historical values and essential water systems. The areas in between the framework, the user spaces, are occupied by high dynamic functions like agriculture and urban functions.

The casco concept is comparable to greenway approach-

es. Both ideas are based on the idea of a spatial separation of low dynamic functions and high dynamic functions. In this way, low dynamic functions are not threatened by high dynamics of other functions.

Although these approaches are characterized by multifunctional networks, there is a sharp separation between functions with different dynamics. The treat of this approach is that it results in a sustainable casco and 'polluted' remaining areas.

Greenway and casco approaches appear in different shapes. Ecological networks are in essence also casco's, but only for landscape ecological purposes.

Thinking in high dynamic and low dynamic use also returns in the strategy of the two networks (Tjallingii, 2000). However, this approach mentions a high dynamic network and a low dynamic network in stead of a low dynamic network and high dynamic in-between spaces.

The strategy is based on expounding of the networks of water and infrastructure. In between other functions are situated. It uses three pillars: the design of networks and the management of flows (using chain management ideas), connecting functions to the network, and the involvement of stakeholders. Focus is on the development of physical structures that support a metropolitan, but ecological sustainable landscape development (21).

Landscape mosaics

Dutch nature policy focuses on the main function of areas, many times overlooking the multiple and joint use of areas. The concept of multifunctional land use tries to reckon with multiple functions. Multifunctional land use is most times a site solution, while policies remain to separate different use in different areas. The concept of landscape mosaics tries to tackle this difficulty.

The landscape mosaics concept of Forman emphasizes different scale levels on which landscape mosaics can be discerned. He mentions planet, continent, region, landscape and local ecosystem as emerging spatial scales (Forman, 1995). A landscape mosaic consists of three elementary spatial entities: patch, corridor, and matrix. Patches are shapes, corridors are lines, and matrices the areas in between (6). This pattern can be distinguished for different land uses. Forman combines these different uses in the aggregate-with-outliers principle which “aggregate land uses, yet maintain corridors and small patches of nature throughout developed areas, as well as outliers of human activity spatially arranged along major

boundaries” (437). According to the author, the principle integrates several landscape ecological principles and has several benefits to humans.

When it comes to planning Forman recognizes that laws, regulations and guidelines meant to protect society from human errors, end in the protection of humans who lack vision or make errors (Forman, 1995: 440). He proposes knowledge, room for creative flexible solutions, and collaboration among individuals as essentials for planning and management (441). To gain knowledge, important three landscape ecological factors to be added to the McHarg method using overlays of maps are structure, function and change (443).

Rethinking planning concepts

What aspects of ecology should we consider from a landscape perspective? In this paragraph we take a closer look at some that are relevant, not only with biodiversity goals as the main criteria, but also by taking into account nature's position in relation to other land uses.

Scale levels

The landscape is observed from a diversity of scales, which are reflected in people's interests. A farmer for example limits his attention to the land he owns, whereas agricultural policies from the national government take a look at the entire country. The same counts for nature areas. National policies impose the construction of new nature areas by roughly drawn dots and lines on a map, while provincial policies appoint its locations more precisely and give specific nature areas clear boundaries with other land uses, sometimes even strictly separated by fencing.

Many times, issues concerning scale levels are determined by social aspects. The fact that scale levels also have a physical side is shown by Forman. He distinguishes scale levels based on the distribution of land use in relation to spatial patterns. Although Forman's background focuses on ecological issues involved with those levels, he acknowledges that other issues also bear typical patterns on different scales. Combinations of patterns resulting from different land uses affect the ecological resilience of an area.

In our opinion, Dutch landscapes show a practical paral-

lel with Forman's theories. Since these landscapes widely differ in pattern and distribution of land uses, they offer a large diversity of optimal distributions of land use. In this regard, the shared ecological value of an area is dependant on more than only its supposed original value as nature area. Worth mentioning here are the peat meadow landscapes. The agricultural use of these meadows not only resulted in a typical landscape pattern, but also in a unique ecosystem with meadow birds. Giving up this natural heritage, which originally stems from cultural use, could result in very different landscape patterns and ultimately in a changed landscape that loses its cultural identity and utility for other land uses.

Separation and intertwining

Two of the main issues of nature development in The Netherlands are connectivity between nature areas and disturbing side effects from other kinds of land use. As a result, nature planning policies focus on a separation of nature from other uses.

Not long ago, nature was opposed to agriculture. The casco model developed by Kerkstra et al. is a separation approach in which nature among other things is separated from larger agricultural areas. Nature policies that came up with the EHS structure use the same strategy. The planning of nature areas is strictly divided from land uses that might be harmful for nature's biodiversity.

As the theoretical review shows, the choice for either separation or intertwining comes from considerations

on time dynamics of land uses. Time dynamics is an important aspect that we mentioned earlier in our explanation on landscape processes. It should never be forgotten how much time it takes to develop a climax forest, in contrast to the ease with which people can destroy it by the construction of for example transportation lines like highways and railway tracks.

However, the initial choice to base separation or intertwining solely on time dynamics of land uses seems a little careless in regard to other aspects of our environment. Other aspects, which in our opinion are important, are landscape scale, pattern and grain size.

In discussing the casco model (Kerkstra and Vrijlandt, 1987), we noticed an integration of land use allocation and spatial patterns. The finders of this model were aware of differences between land use and spatial patterns and developed the revolutionary idea to combine them in one model.

However, consequently they were forced to make choices. Which casco would be the most sustainable? We were attracted by this question and made an analysis of the land use and spatial patterns recognized in the casco model.

Stripping the casco model

We will explain the issue of separation versus intertwining by comparing the study area used for the development of the casco model with one of our own study areas. The casco model, developed by Kerkstra and Vrijlandt



The Achterhoek; a scattered pattern of planting and land use follows the natural structure of the landscape (south of Winterswijk)



The Green Heart; a straight pattern of land use and settlements results from the artificial origin of the landscape (Bovenlanden)

(Kerkstra and Vrijlandt, 1988) is made for the sandy landscapes in the east of the Netherlands; the Achterhoek. We use this area as a first example. The second example is our own work in the Green Heart area in the west of the country.

Case Achterhoek

The detail from the topographical map shows an area just under the city of Winterswijk. These are the higher grounds of the Netherlands. Spatial characteristics of the Achterhoek are related to the small scale of the spaces. It knows a scattered pattern of wood banks, woodlands, and small villages. Their arrangement is based on soil qualities, altitude and natural water flows of small brooks. The surface is heterogeneous with brook valleys, arable lands, cultivated moor lands and settled drifting sands. Land use characteristics follow this small-scale pattern and show an integration of different (agricultural) uses on a small scale.

Problem of the landscape of the Achterhoek is the decline of the old planting structure and a non-sustainable use of resources. A formerly dense and equally spread pattern of wood banks is affected by the modernization of agriculture. Due to larger farms, originally small farming parcels are taken together. Wood banks that for centuries were part of the farming system and used as inclosure, wind barrier and source of timber are taken away. As a result, the old cultural landscape pattern suffered from tremendous changes, which also touched at the cultural identity of the region, although farmers were willing to pay this price in order to make a decent living.

In response, Kerkstra and Vrijlandt developed a casco that tries to preserve the identity of the original landscape. The casco is based on the natural water system and combines high dynamic areas (mainly agriculture) in between a low dynamic casco of nature, water and recreation to provide opportunities for both agricultural land use and a sustainable treatment of water and nature qualities.

The development of the casco facilitates in a sustainable allocation of resources and combines land use with spatial characteristics into one casco. Forests, planting along natural stream and wood banks on higher grounds become part of the spatial pattern of the low dynamic casco, in which the water management, recreation and nature are allocated. Those areas are protected and developed to preserve landscape characteristics. The open areas in between know little restrictions for large scale agricultural use, offering opportunities for high dynamic land uses. Small scale patterns of wood banks here are given up. In practice, this should mean that there are no restrictions for farmers any more to enlarge their parcels by cutting down wood banks.

Case Green Heart

We studied an area located in the Green Heart region. Spatial characteristics of the Green Heart are based on an almost entirely manmade system of polders, lying below sea level. The natural drainage of former peat fields is still visible by their rivers, but polder patterns in between are determined by human cultivation. In contrast with the enclosed landscapes of the Achterhoek,

this region is relatively open with wide views on the horizon.

The map detail shows the area of the Bovenlanden around peat river Kromme Mijdrecht. It is spatially characterised by a strip of houses and farms along the river, and an open area behind them. These two 'images' are found all over the region of the Green Heart. Settlements accompanied with a lot of planting forming the visible spatial framework in which open agricultural fields are caught. In the area of the Bovenlanden, new recreational areas are built up in recent decennia, following the straight structure of the parcelling. From a land use perspective, the area knows a wide diversity of land uses. Recreational activities, nature and landscape conservation, commercial lots, and building strips alternate. The contrast is not as much between nature and agriculture, but more between rural aspects and metropolitan influences.

If we try to fit land use and spatial pattern of this type of landscapes into the casco model, distribution of land uses and spatial patterns turn out to be complementary. The land use pattern along the Kromme Mijdrecht (the strip) is high dynamic and, speaking in terms of casco and in between space, can be characterised as in between space. The low dynamic part is associated with the open areas with nature and agricultural fields. However, if we look at the spatial patterns, the strip forms the landscape's structure and can be characterised as a stable framework, while the open landscapes changes in appearance due to marginalization of agriculture and new recreational activities.

Critique

As a conclusion, we can pose that for the Achterhoek, separating in a casco works out well for land use patterns, but spatial characteristics are lost by the creation of large entities in an 'originally' small-scaled landscape. Although the functional casco might be successful, the casco here has no answer to problems with landscape pattern.

On the other hand, one should consider that changing landscape patterns have always been a result of human intervention. On the long run, a radical change in the Achterhoek maybe is not bad at all. However, as the final report for the Achterhoek shows (Kerkstra and Vrijlandt, 1988), the region is only seen from a regional perspective. The absence of moving in between different scale levels while designing might have resulted in not fully recognizing essential patterns on other levels.

In our opinion, Kerkstra and Vrijlandt invented the right tools to design a landscape structure. They used concepts about separation and intertwining of high and low dynamic types of land use in a spatial-functional context. We believe these are the right tools, but acknowledge that there is no one-way approach to solve problems in different landscapes and for different scale levels. Separation and intertwining are no ultimate solutions for an entire region in most cases. For every region, different patterns can be distinguished, whereas spatial or functional use. Patterns also differ per scale level. Therefore, we believe that a choice for either separation or intertwining should be made with terms like scale, pattern and issue in mind.

Large key locations and permeable 'white' areas

Nature development in The Netherlands is inspired by the extinction for flora and fauna, caused by the fragmentation of land and resulting in habitat loss and isolation of species. To stop the fragmentation process and ultimately the extinction of species, the government sets the goal to reconnect existing large natural habitats by means of constructing ecological networks. The construction of ecological networks can be described by using terms like patch, corridor and matrix. In describing ecology in those terms, there is made a relation with architectural theory describing points, lines and planes. For example, Lynch (1960) formulated a comparable set of spatial elements to describe the image of the city in terms of district, edge, path, node and landmark. Although Ahern, Forman and Opdam use different words to describe the components of ecological networks, their interpretation of those words is almost the same. In essence, ecological networks are described by discerning large nature areas (patches) that need to be connected by 'lines of nature through the civilized world'; the corridors. The civilized world is seen as the 'white areas' (the matrix), which also has some ecological values, however not a high as the other areas.

From a landscape point of view and in accordance with nature policies we recognize priority components that are of main importance to reestablish habitats for endangered species. Always, there should be some large nature areas, functioning as key locations for species popula-

tions. Besides, we consider the permeability of 'white' areas' of major importance. The recognition that nature is not only restricted to nature areas itself offers possibilities relate the aesthetics of landscape in general to specific goals on biodiversity.

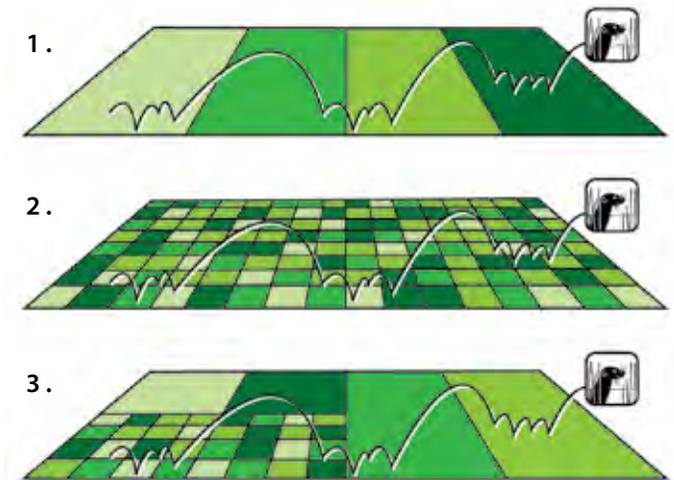
Landscape pattern and grain size

Land use and spatial patterns were mentioned before in the paragraphs scale and separation and intertwining, but here it gets some extra attention in relation to the grain size of patterns. Forman (1995) describes grain as "the coarseness in texture of an area, as determined by the size of patches recognized". The grain size of a patch can be small and thus fine grained, or large and coarse grained. Speaking in terms of ecology, typical combinations of grain sizes provide specific conditions (ecotypes) for flora and fauna.

If we review the meaning of patches and corridors in a larger context, this means not only in terms of ecology,

the landscape itself also can be described by the grain size of patches and even corridors. Every landscape has its own grain size of land use and spatial patterns. In the Achterhoek, a fine grain size is found where spatial patterns correlate with a scattered land use pattern. A combination of coarse and fine grain sized patterns is found in the other study area, the Green Heart, where settlements along streams and canals consist of fine grained land use and spatial patterns, and the land and around is characterized by more coarse grained land use (only farming) in a coarse grained spatial pattern (no planting).

Considering that 1) a landscape consists of patches that can differ in size and dispersal and 2) that typical landscapes differ in the arrangement of those patches, a link can be made between ecological networks and the characteristics of Dutch cultural landscapes. In doing so, the historical gap which exists between landscapes ecologists and landscape planners and designers might be bridged.



Ecological effects of grain size
source: Forman (1995)

- 1. High landscape diversity with low local diversity**
Good for interior species, specialists, high species richness, wide range of environmental conditions
- 2. Low landscape diversity with high local diversity**
Good for edge species, multihabitat species, generalists, widespread pollution
- 3. High landscape diversity with variable local diversity**
Good for all of the above, except limited area of pollution

Arts and architecture (basic elements)	Lynch (1960) The image of the city	Forman (1995) Land Mosaics	Nature policy (1990) EHS concept
Point	Node & landmark	Node (small patch)	Node
Line	Path & edge	Corridor & boundary	Corridor
Plane	District	Patch	Key area

Elements in arts and architecture in relation to theories by Lynch (1960), Forman (1995) and Dutch nature policies (1990)



The Achterhoek; fine grained land use and spatial patterns of settlements and fields

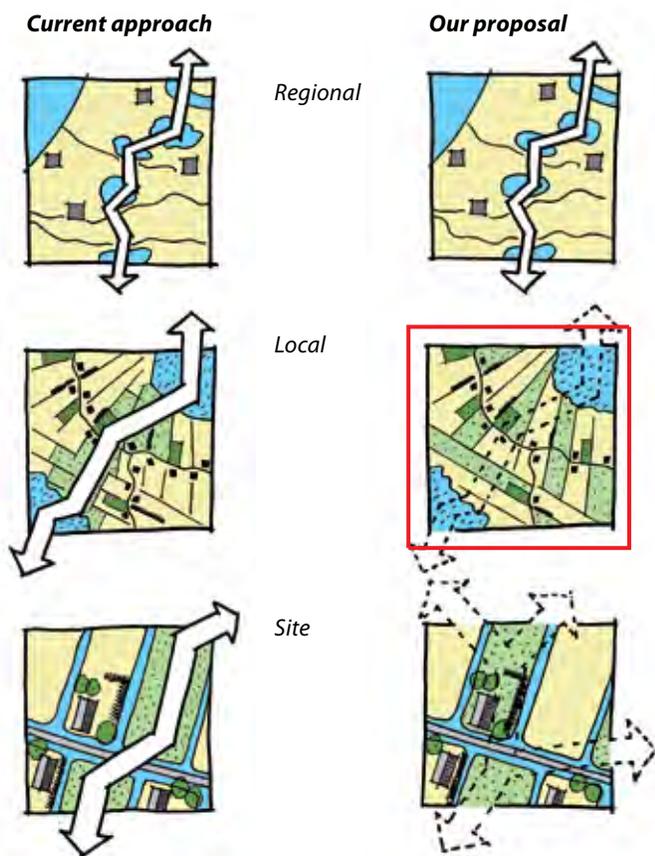


The Green Heart; fine grained land use and spatial pattern in strip settlements (horizon), coarse grained land use and pattern pattern in the fields

4.5 Design philosophy

In the previous paragraph, we stated that besides issues on separation and intertwining also aspects like scale level, landscape pattern and grain size should be taken into account. Also, it became clear that the language spoken by ecologists and planners and designers do not differ as much as people think.

In this paragraph, we try to combine all these aspects in a design philosophy for the development of new nature in the Netherlands. Finally, a design philosophy is presented that relates a landscape perspective to meanings of nature.



A landscape perspective on nature asks for scale specific planning and design of new nature. The local (landscape) scale is crucial

Today's narrow scope of nature planning

In relation to the previously mentioned scale levels, we distinguish three scale levels on which planners and designers take decisions. The national government takes decisions concerning the different regions of the Netherlands. The Green Heart for example is one of those regions. Decisions are made on how different parts of the country should develop. Let us call this the regional level. One stage below, the local scale level can be distinguished. Here, planning and designing is done by both provincial and municipal government. The lowest level is that of the site. Next to actions from municipalities, also initiatives directly from people or companies are part of planning and design practices. Think for example about a farmer who builds a new barn or a real estate developer making a golf park or housing district.

In the light of this context and the three scale levels that are discerned, we are of the opinion that today's nature policies are not taking into account these scale levels very well. For the development of nature within the EHS, the national government appointed the approximate allocation of the wetland corridor through the Green Heart. On this highest scale, nature planning is separated from other land uses. In the case of the wetland corridor, a continuous line is drawn from Lake IJ near Amsterdam towards the swamps of the Biesbosch. In plans on the local scale level, the same rigid and clearly bordered corridors appears and even on site level more or less the same location as in the regional plans is maintained as being the best location for nature planning.

Through all three scale levels, nature is spatially and functionally separated from other types of land use. We believe this is not the right way to create nature areas in

the landscape. Especially on the local scale level, just choosing for separation does not take into account the surrounding landscape. If we want to preserve and develop nature from a landscape perspective, we should reconsider separation choices that are made on the highest scale level and bring in new issues and knowledge that are specifically important on a local level. Maybe intertwining on a local level is better in some areas? What actually is separation on local level and how does it differ from the regional level? These kinds of questions should be answered to be able to develop a useful and true landscape perspective on nature. Once choices on a local level are made, specific sites can be designed. And again, choices made on a local level should be reconsidered specifically on site level.

A new design philosophy

As mentioned before, today's narrow scope of nature planning stemming from solely a biodiversity perspective, should be transformed into a landscape perspective, in which biodiversity goals coexists next to other land claims.

We believe that on a local scale level nature always should be seen in relation to other land uses and therefore should be intertwined as much as possible. However, the degree in which nature on a local scale level can be *spatially* separated or intertwined differs and is scale level specific. The choice for either separation or intertwining can be made by taking into account considerations from a landscape perspective on the local scale level, where nature and other land uses need to be in coherence with existing pat-

terns in the landscape. This might imply a strategy that looks more like intertwining. On the site level, decisions taken locally can result in a social and spatial integration of nature with other types of land use.

Meanings of nature from a landscape perspective

From a landscape perspective, nature can be described by process, organization and aesthetics (see chapter 2). A closer look at nature policies tells us that there already is a lot of knowledge and understanding on the process and organization of nature. The science of ecology provided in useful theories to look at nature in terms of processes between abiotic and biotic. Also, today's nature policies are quite clear about how nature should be used and organized in society and what roles of nature are. Although some kind of roles of nature are not yet fully recognized and established, ideas about how it should be used are abundant.

The only component in policies that lacks attention is nature's aesthetics. In the problem statement, we appointed that with today's biodiversity perspective, aesthetics are not very important compared with criteria

like fragmentation of habitats, level of disturbance and abiotic conditions. From a landscape perspective however, the importance of aesthetics increases as other roles of nature - the cultural landscape and the recreational landscape - are seen in relation to biodiversity goals.

One of the aims of this study is to search for a method to give a spatial interpretation to a pluralistic meaning of nature. This can be done by giving space to a holistic approach of the ecological paradigm. However, a holistic approach to nature in the ecological paradigm doesn't offer much to hold on. Therefore we need to go back to the critique on current nature policies and take a closer look at different meanings of nature in the ecological paradigm. We discern three different issues concerning nature:

- The ecological value of nature, articulated in biodiversity (future value)
- The experience of nature as a cultural landscape (experiential value)
- The different social use of nature, especially recreational (user value)

This division is a deliberate simplification of different values of nature in contemporary society. By this simplification we are able to work on different roles of nature. We do not claim to cover all meanings of nature, but we contribute to an approach with more social benefits.

By addressing both roles of nature and landscape components (aesthetics, process and organization) we are able to combine a broad interpretation of nature with the design of nature in the Dutch context.

Conclusions

We can draw conclusions that can help us to develop a landscape approach of (new) nature in the Dutch landscapes. Theory should be combined with practical experiences. With the conclusions of the theoretical exploration in mind, the next chapter introduces the area of the Wetland Corridor in which four local case areas (projects) are investigated where new nature has been developed or is planned to be developed. Considerations that serve as philosophical basis for explorations in the field and also contribute to the development of a new strategy are as follows:

1. Nature is reviewed from the ecological paradigm in an holistic approach
2. Nature is seen from a landscape perspective and analyzed by its ecological, cultural and social role.
3. Different roles ask for different design of nature.
4. Nature planning and design pays attention to differences between scale levels.
5. The matrix is considered to be part of the ecological network.

	Meaning of nature		
Landscape perspective	Ecological value	Cultural value	Social value
Aesthetics	Eco-technological	Historical	Interactive
Process	Biodiversity	Cultivation	Recreation
Organization	Conservation	Maintenance	Regulation

Meanings of nature from a landscape perspective





Design context

5

the wetland corridor

Introduction

Chapter 3 already introduced the background of the case study, by elaborating on the history of nature conservation and nature policies in the Netherlands. This chapter focuses on the characteristics of the regional case area and specific policies. The next chapter discusses the exploration of nature and landscape in four local cases.

Firstly, a description of the landscape is given. Secondly, we elaborate on plans for the wetland corridor and how these plans are realized. After that, we focus on regional policies related to the wetland corridor. We finish the chapter by a choice of four local case study areas.



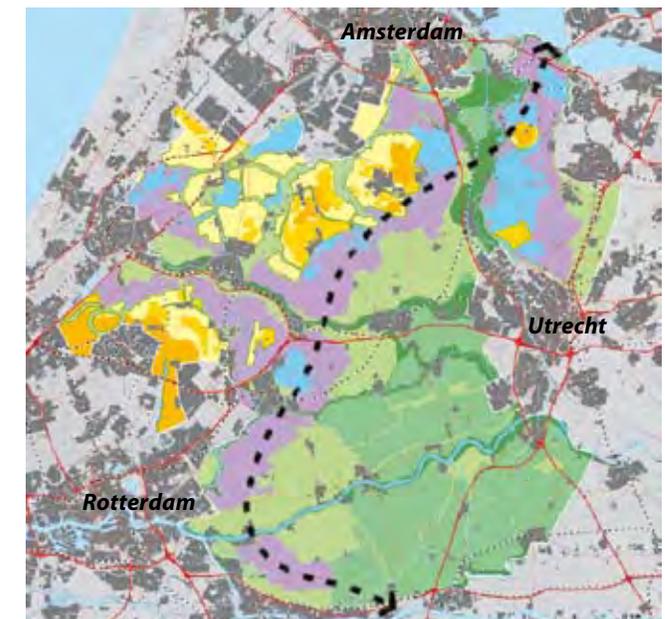
Wetland Corridor and study area



Important Wetlands source: moerasvogels.nl (2007)

Landscape entities of the Green Heart region
source: Ontwikkelingsprogramma Groene Hart (2006)

-  low peat area with strong subsidence
-  high peat area with modest subsidence
-  peat area with thick clay layer and river clay area
-  reclaimed lake with brackish seepage
-  reclaimed lake with large (fresh) seepage
-  reclaimed lake with little (fresh) seepage
-  natural levee
-  wetland corridor



Landscape of the Green Heart

The Wetland Corridor is planned in the most densely populated area of The Netherlands, which is the metropolitan area of the Randstad. Although it crosses the urban centre of the country, it connects very rural areas in the Green Heart avoiding as much as possible connections to urban nodes of the Randstad. However, sometimes a close interaction with urban areas is inevitable. This is the case in the regions of 't Gooi (in the north), the urbanised area of Mijdrecht (in the polders) and near Gouda, where the space for the corridor is very small. Especially close to larger rivers like Oude Rijn, Vecht, Hollandsche IJssel and Lek, the corridor is cut through by several infrastructure lines like motorways, railways, canals, rivers and local infrastructure.

Most of the area is agricultural land, mostly in use by dairy farms. Farming is having a hard time to survive, since production costs are higher compared with non-European competitors. Partly, these higher costs are compensated by European and Dutch subsidies, but European quota on production also brings in a lot of restrictions.

The metropolitan context of the Randstad puts great pressure on land and makes prices of agricultural plots rise sky high. Even though, Dutch farmers benefit from metropolitan influences as well by a growing market for luxury products and an increasing interest for recreational activities on the countryside.

The Wetland Corridor crosses the lower part of The Netherlands where the land lies below sea level. Due to settlement of peat lands, the area lies below the water table of large rivers as well. Dikes and a constant drainage by pumping have to keep the water out. These circumstanc-

es resulted in a completely artificial hydrological situation, most of the time optimized for agricultural purposes. Especially peat cultivations ask for a very precise water management which balances between an effective agricultural drainage and high water levels to avoid further soil settlement. Nonetheless, the settlement of the soils still continues. The only way to stop settlement is to quit artificial drainage, which will stop the peat from oxidizing.

Recently, the three provinces within the Green Heart published a development perspective on the area in which the Wetland Corridor is planned in those areas that suffer from the strongest soil settlement. As a continued lowering of the water level in these areas is not desirable anymore, future land use should change from mainly agriculture to recreation, water storage, nature development and extensive farming. In this regard, the location choice of the Wetland Corridor is not surprising and might even profit from these hydrological circumstances.

Landscape: the result of reclamation

The wetland corridor crosses different landscapes which originate in peat cultivation. On several places the peat land is cut through by rivers on an elevation of sandy or clay soil. In the following the different landscapes will be discussed.

Origin of the landscape of the Green Heart

After the sea went back 6000 years ago, organic material was conserved in the lagoon that remained. A thick layer

of peat developed. During the middle ages the peat lands were cultivated, from different peat rivers to the centre of the peat bog. Originally, the peat lands were suitable as arable land, but the draining caused oxidation of the peat and the soils quickly settled. The peat lands became too wet for arable land and were used as grasslands, today known as peat meadows. Due to the settlement, the former high peat lands sunk below the water level of the peat rivers. The last centuries the peat meadow polders were used by small dairy farms. They processed the milk themselves to cheese. Some pigs were fed with rest products. After the improvement of the transport possibilities processing at home was no longer necessary and together with the cheese, the pigs left the farms (Heukels, 2007).

Different peat cultivation patterns exist. Sometimes they have a radial structure, or a continuing strip structure. Large part of the peat meadow landscape is cultivated by so-called cope-parceling. During the 11th and 12th century the area used to be the property of the diocese of Utrecht. The bishop and convents contracted labors to cultivate the land. This contract was called 'cope', characterized by tiny strips of 100 to 150 meters wide and approximately 1250 meters deep (Stichting voor Bodemkartering, 1970). The cope-parceling ends on a watercourse and small dike, mostly planted. One of those dikes used to be the old border between the diocese of Utrecht and the county of Holland. Only since a few decennia transport in the area uses roads, before most of the transport used the water infrastructure. The different cultivation patterns of the peat meadows and especially



River landscape; peat cultivations out of natural levees (dike east of Gouda)



Peat landscape; peat cultivations from peat streams and canals (Bovenlanden)



Landscape of reclaimed lakes; cultivations of peat fields that are dig up or washed away (Polder Groot-Mijdrecht)

the cope-parceling are considered to be important cultural heritage. Moreover, the cultural peat meadow landscape has become one of the most important ecosystems for grasslands birds. Peat meadows are the home of the largest breeding area of the black-tailed godwit (grutto).

Natural levees

To begin with the river landscape, rivers Lek, Hollandse IJssel, Oude Rijn, and Vecht cross the area of the planned nature corridor. The rivers leave their sediment along the river bed. Because of the fertile sediments and the capacity of the soils, the levee is already early in history occupied by people. Nowadays, these areas are still characterised by a high residential use. Besides, the riverside differs from the surrounding landscapes by its agricultural use. Several small scale orchards, croplands and kitchen gardens show together a scattered pattern, contrasting to the pasturelands of the peat landscapes. Old roadways follow the river in these areas. In former days, transport was done by tow boats. To enable this, pathways for horses were realized on riverbanks, the so-called 'jaagpad'. Nowadays, these paths functions as recreational routes.

Peat meadows

The peat meadow landscape is considered to comprise of peat cultivations, peat reclamations, and natural levees along peat streams and rivers in between peat cultivations. Opposed to the levees, peat lands are mostly grand and empty areas consisting of pasture-

land. Buildings are often allocated along the cultivation base, mostly watercourses. Often, houses are connected to the roads by a bridge spanning the watercourse. Along the watercourses, truncated willow trees (knotwilgen) are planted. The cultivation of the peatlands was in a lot of areas strictly regulated. Lots have fixed sizes and end often on another watercourse and a small dike. The peatlands are characterised by narrow lots separated by ditches with high water levels.

Different peat meadow entities

Peat lands south of the river Oude Rijn have a different character than peat lands north. They are enclosed by rivers and can be seen as the flooding plains of the rivers. Peat lands north of the Oude Rijn used to be part of a major peat bog drained by small peat creeks. This area was cultivated in different directions, following creeks or dug canals. Some bogs are cultivated from different directions, resulting in a radial structure. Others have no end on a dike, but continue for kilometers. The peat of some peat lands is dig up after cultivation. People used the peat for burning. They dug up the peat in long ditches and dried the material on remaining strips of land. Later on, surges break away most of the remaining land strips and large peat lakes remain. Remaining strips of land are planted with trees to keep the soil in its place.

Reclaimed lakes

Like the peat lakes, the peat of reclaimed lakes is dug up. Later on, water was pumped out to use the sea clay bottom for agriculture. Another reason to reclaim the land

was the danger of large peat lakes, since a lot of lakes become bigger due to surges which break away peat banks during storms. Important polder areas in the area of the wetland corridor are the Horstermeer polder and the Groot-Mijdrecht polder. Around the latter, a strip of “bovenlanden” is situated. These lands are between areas of reclaimed lakes, separating peat lands with a high water level from the reclaimed lakes with a low water level. Differences in elevation between peat lands and reclaimed lakes depends on the size of the peat layer. The difference between the Horstermeer polder and the surrounding peat lands is about 2 meters, while the Groot-Mijdrecht polder is about 4 meters below the surrounding peat lands.

Reclaimed lakes are characterized by large lots and farms spread over the polder area. Most farms are surrounded by trees and shrubs. Therefore, a structured pattern of autonomous farms along the lanes exists.

Water: management of the system

The water management of the rural peat meadow landscape without doubt is one of the leading aspects for future planning and design interventions. Managing the water system is closely related to subsidence, caused by settlement and oxidation of peaty soils. This is the result of a constant drainage necessary to create living conditions and to work the land.

Until late twentieth century, the landscape was characterized as a rationally arranged area designed for agricul-

Landscape typologies

-  **River landscape**
peat cultivations from natural levees
-  **Peat landscape**
peat cultivations from peat streams and canals
-  **Landscape of reclaimed lakes**
cultivations of peat fields that are dig up or washed away
-  **Sand landscape**
dunes and ice pushed hills
-  **Sea clay landscapes**
cultivations from sea clay
-  **Open water peat lakes**
-  **Major cities**



tural production. Since the eighties of the twentieth century however, the landscape is transforming into a multifunctional landscape (Witsen, 2006). Many other functions have settled in the rural area, often stemming from a metropolitan context like urbanization, infrastructure cut off's and recreational uses. Also the preservation and development of nature areas is an example of metropolitan developments.

The diversification of the former agricultural landscape with many other kinds of land use has major consequences for the management of the water level. Formerly, the management was orderly with only little subdivisions. Every polder formed its own hydrological entity. Nowadays, together with a growing variety of land use, the demand for activity adjusted water levels increased as well. For example, to make agriculture viable and profitable it requires a low ground water table, or at least a drainage regime that follows the settlement of the soil. In contrast, build areas demand as little drainage as possible to prevent rotting of timber foundation posts. A constant high ground water table is demanded. The same counts more or less for nature areas. Although sometimes little fluctuation of the (ground) water table is not harmful and can even be desirable, a high table is necessary for the development for specific ecosystems like bogs and meadowlands.

One result of this diversification of land use is an ongoing subdivision of (often small) areas with different water levels. Within polders there emerges a scattered and fragmented pattern of water levels, generally varying only a few decimeters, resulting in higher costs for man-

agement and maintenance. Many small areas are either drained lower or even irrigated to gain specific conditions. It also implies a decrease of the water quality since the water circulation is not optimal. Even more alarming however is the increased risk of failure because the system is getting more complex (Kuiper, 2005). Considering forecasted changes in whether conditions caused by climate change, the peat meadow area is likely to drain larger quantities of water in the future (Witsen, 2006).

Polders: functioning as defined units

One major implication of the water system acting as the main regulating force is a strict spatial division between polders. Over time, mankind has worked the originally peaty soils in different ways. This resulted in a patchwork of polders, either peat cultivations or peat reclamations. A polder is a low-lying tract of land that forms an artificial hydrological entity. Between polders, differences in relative height of the surface level reach up to five meters, acting upon ground water flows in the surrounding landscape. An example is the brackish seepage in polder Groot-Mijdrecht, a reclaimed lake functioning as a depression in the landscape. Therefore, in the peat meadow landscape every polder forms its own artificial hydrological entity, although in a broader context hydrologically related to other polders.

Nowadays, due to a diversification of land use there are many differences of only a few decimeters in water level within a polder. Nevertheless, the outer borders of a



The Dutch polders. All blue polders are below sea level. A darker color indicates a lower surface level
Source: Geuze and Feddes (2005)

polder are still distinctive, since water levels between polders also influence water flows on a larger scale level.

A patchwork of polders is typical for the landscape of the peat meadows. The fact that this landscape is for the greater part man-made is illustrated in the artificial hydrological system. It requires constant drainage by pumps to prevent the water table within the polder from rising too high. The peat meadow landscape and its artificial foundation are in contrast to other Dutch landscapes, which are based on more natural systems like for example the sandy areas. Those regions form large, unified entities in which local hydrological systems naturally fit into the region.

The ecological purpose

The concept of the Wetland Corridor grounds in a close relationship between ecological network theory and nature policies. To understand the Wetland Corridor, some knowledge about both the development of the EHS, ecological targets and implementation is necessary.

The EHS as a spatial concept

Ecological network theory is dominant in both the implication of the thinking about nature and governmental policies. Furthermore, the network theory forms the theoretical framework for the development of a spatial concept named after the policy: *Ecologische Hoofdstructuur* (EHS). This concept, existing of nature reserves, nature corridors, and nature development areas is influential in the spatial development of the Netherlands. Moreover, the addition of robust corridors and the focus on bridging major barriers between nature areas resulted in many radical plans. These plans should result in an increasing quality (biodiversity) and quantity (square meters) of nature. Accordingly, spatial planning is involved.

The introduction already mentions the sectorial character of the EHS concept, while policies approach spatial development increasingly integral. We conclude that an integral policy is best implemented by integral spatial concepts. Although ecological network thinking might be one of the pillars of spatial development strategies it seems wise to integrate this thinking in a regional (landscape) context.



Ecologische Hoofdstructuur, LNV (1990)

There are a couple of considerations to be taken into account when thinking about spatial concepts. Firstly, last years the importance of generic spatial concepts decreased because they do not answer the call for a regional approach. Together with the decrease of generic spatial concepts, strategic spatial concepts lose importance in favor instrumental concepts, which facilitate the implementation of specific planning and policy instruments (Hidding, 2006).

An example of a spatial concept which is both regionally oriented and instrumental is the concept *stadslandschap*, which was introduced by the *Visie Stadslandschappen* (Croonen, 1995). This concept leaves a



Robust corridors (in red) in the EHS, LNV (2006)

strict separation of city and countryside, but the implementation depends on the regional or local interpretation. The identity of the place is central. On the other hand, it is instrumental because it forms the framework for the development of new estate areas.

Like the *stadslandschap* concept, the approach we stand for can be a comparable spatial concept, leaving space for multiple interpretations without creating strict guidelines for implementation. A spatial concept should answer how new nature can be developed as a new layer in the cultural landscape or how new cultural landscapes can be created by nature development.

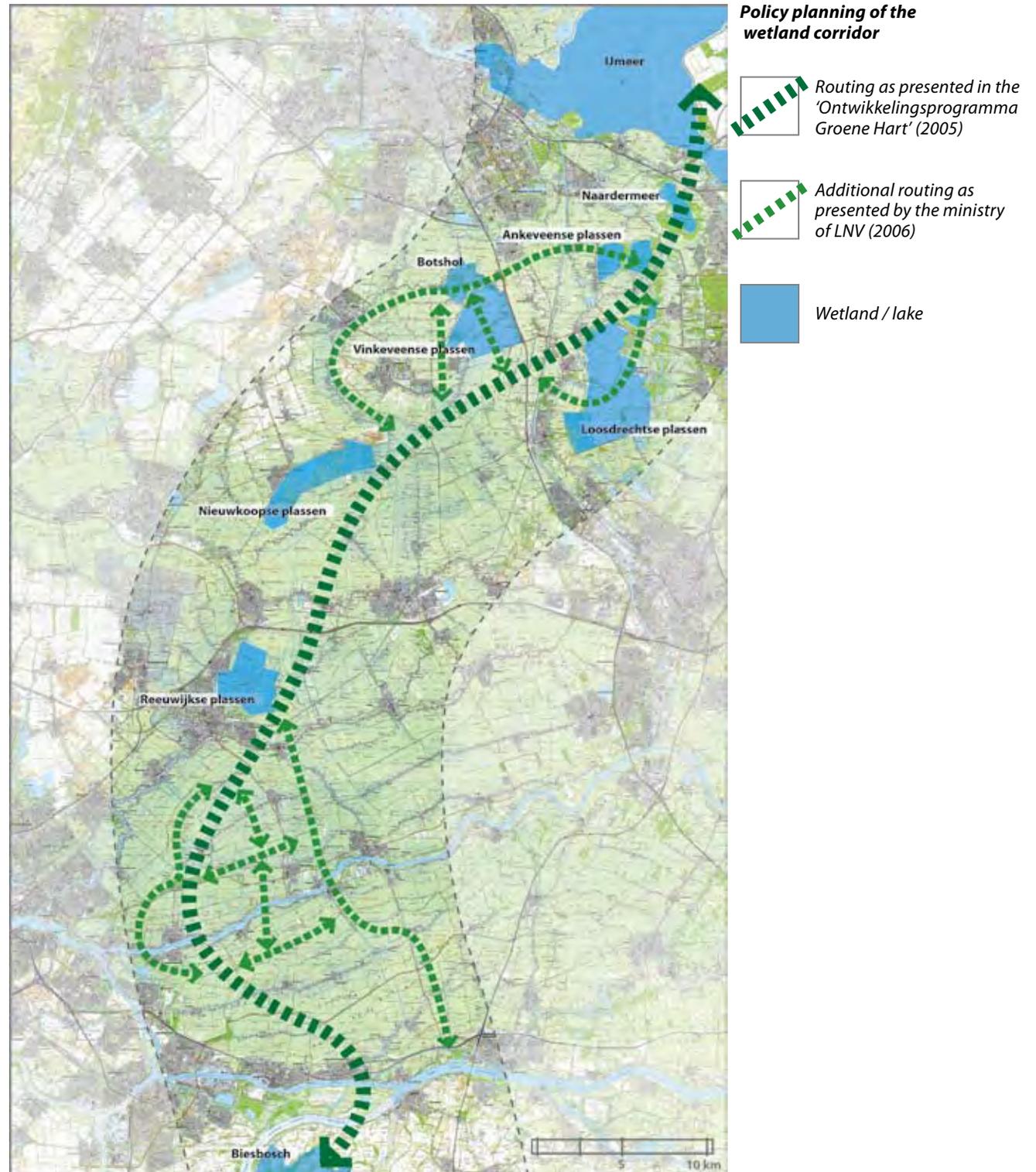
Connecting the Dutch wetlands

The policy plan on nature, forests, and landscape in the 21st century – *Natuur voor mensen, mensen voor natuur* - (Ministerie van Landbouw, 2000) mentions the construction of robust ecological corridors in order to improve the spatial coherence of the Dutch ecological network strategy describe by the Nature Policy Plan (Ministerie van Landbouw et al., 1990). (See also chapter 3.) One of the robust corridors is planned between Lake Lauwers in the north of the Netherlands and the brackish waters in Zeeland (south-western part of the Netherlands). The wetland corridor aims to connect different large peat swamps of in total 13.000 – 15.000 hectares with each other (Ministerie van Landbouw, 2000).

Our study focuses on the section where the corridor crosses the Green Heart, located between Lake IJ and the fresh tide water area “Biesbosch” and connects the nature reserves, Reeuwijkse plassen, Nieuwkoopse plassen, Vinkeveense plassen, Loosdrechtse plassen, Ankeveense plassen, and the Naardermeer.

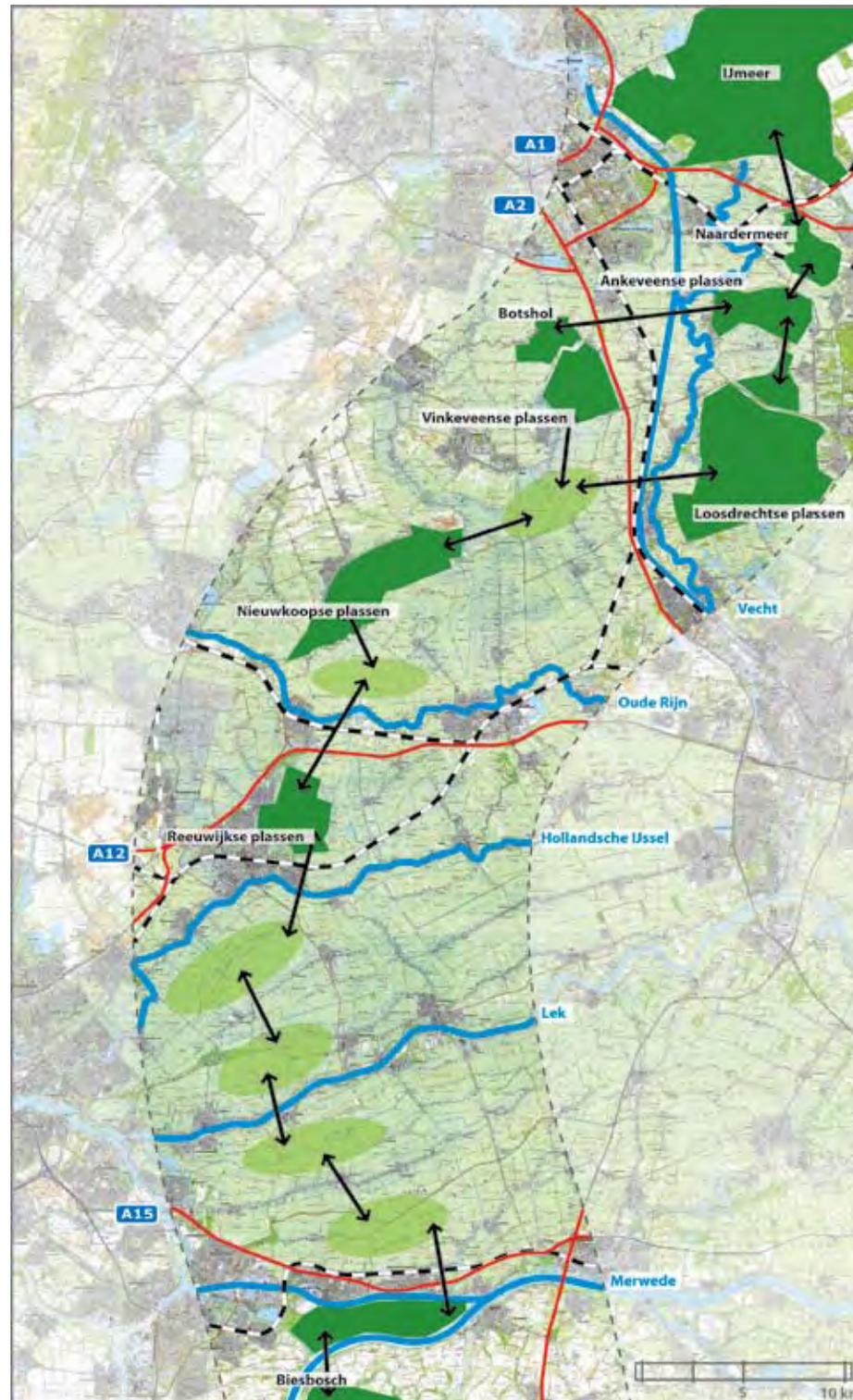
Ecological targets

According to research institute Alterra, the corridor should consist of two different types of ecosystems: “grassland and small waters” and “swamps, shrubs, and large waters” (Broekmeyer and Steingröver, 2001). Contrarily to standard ecological corridors, the design of robust ecological corridors is not based on ecological targets - species that determine the demands on the corridor -, but on ecosystem targets (see Appendix) to



Design of the Wetland corridor in relation to rivers and infrastructure

-  Nature key area (existing wetlands / lakes)
-  Nature development area (indication)
-  Nature corridor (indication)
-  Highway
-  Railway
-  River / canal



improve the utility of the corridors (Broekmeyer and Steingröver, 2001).

Besides these ecological targets, the area of the Wetland Corridor holds more ecological values than those covered by the aims of the corridor. Large parts of the area are increasingly important for meadow birds. Meadow birds are very dependent on the continued existence of the landscape and they certainly represent the largest ecological value of the area. However, robust ecological corridors have been designed for species with limited migration possibilities. Therefore meadow birds are no objective in the policies for robust ecological corridors.

Implementation

From 2007 on, finances for the development of the wetland corridor come from the ILG budget (Inrichting Landelijk Gebied; development rural areas), which is a clustered budget for all developments in the rural areas. However, a specific part of this budget is reserved for nature purposes and accordingly for the development of the wetland corridor. A large part of the ILG budget comes from the national government; the national government supplies half of the financial resources for the development of new nature areas managed by private nature conservation organizations and the whole amount for the areas managed by Staatbosbeheer.

Provinces delegate the purchase and realization of new nature areas to DLG (*Dienst Landelijk Gebied*; the national agency for the development of the countryside). Together with the provinces and the future owner (most times a

nature conservation organization) they determine the arrangement and design of the area. After realization of nature development projects, the areas belong to *Natuurmonumenten* or *Staatsbosbeheer*, who carry out maintenance in the area to reach the intended ecological goals.

The Dutch ‘*waterschappen*’ (regional water authorities) have a central role in nature development as well since they are responsible for water levels in polders and therefore are involved with new nature areas. Moreover, the *waterschappen* carry out maintenance of watercourses, banks and dikes, and are often responsible for (parts of) the realization of the EHS.

Nature Area Plans

Nature Area Plans have a central role in the implementation of national and provincial nature and landscape policies, especially concerning the realization of the EHS. Both existing and new nature areas are bound by Nature Area Plans. Nature conservation can be executed by both private maintenance and nature conservation organizations. Nature Area Plans are the base for the subsidy awarding (Provincie Utrecht, 2002).

Nature Area Plan De Venen (Natuurgebiedsplan De Venen) describes the desired quality of (future) nature reserves in the part of De Venen that belongs to the province of Utrecht. This is done by formulating ‘nature goals’ for every nature area. The swamplands of the Vinkeveense plassen and the Nieuwkoopse plassen are considered as key areas. Next to the conservation of these areas and the development of corridors between these areas,

the plan puts forward specific values. For example natural grasslands for birds, but also the value of landscape elements and archeological values. The plan appoints the areas of Bovenlanden and the eastern part of the Groot-Mijdrecht polder as new nature reserves. Besides, the southern part of polder Groot-Mijdrecht is destined as a park landscape for recreation, nature, and water management functions. The Nesserdwarstocht is appointed as an ecological corridor between the nature reserves of Groot-Mijdrecht and the Bovenlanden area (Provincie Utrecht, 2002).



Although meadow birds are no objective in nature policies, they are very dependant on grasslands and small water



Swamplands with shrubs and open waters are habitats for several endangered birds. Ultimately, also the otter should return in these areas



Ecosystem type grassland and small water (Bovenlanden)



Ecosystem type swampland and shrubs with large water (nature reserve Botshol)

5.3 Regional policies

Since a couple of years an increasing number of sectorial policies is implemented in regional policies. These policies combine different spatial claims for one area. One of the results of this development is a merge of several budgets into one ILG budget. Another consequence is a growing influence of regional agreements in favor of sectorial policies. This paragraph deals with this trend and mentions some important regional policies for the Wetland Corridor in the Green Heart region.

Spatial Development Politics

We mentioned the *Nota Ruimte* (the national spatial strategy) several times now, but we did not elaborate on the most revolutionary part of it. Important here is the introduction of spatial development politics. Spatial development politics differs from traditional spatial planning strategies in the Netherlands. Instead of old policies, which are based on restrictions of spatial developments, new policies are based on “*active intervening in the spatial organization through the development of spatial projects*” (Hidding, 2006: 183). Spatial development politics are in accordance with the advice of the Wetenschappelijk Raad voor het Regeringsbeleid (scientific advisory council for government policies) and based on two principles: selectivity and diversity. The government works out selectivity through delegation of tasks to the provinces and by keeping only the national issues for themselves. Diversity is mainly implemented by a regional approach. Related to this aspect of diversity is the intention of plan concepts, which should be open

for regional implementation (Hidding, 2006: 185-186).

Policy objectives described by regional plans take care of the implementation of national policies like the *Nota Ruimte*, but also the *Agenda voor een Vitaal Platteland* (Programme for a Vital Countryside), the spatial strategy for the countryside. Every seven years, the national government enter into authoritative conference with provinces to make agreements on the objectives and available finances. Concerning the realization of plans, acquiring land is often difficult. Moreover, parts of plans with financial benefits are often realized while the other parts get stuck. By using regional policies beneficial functions are asked to pay for less beneficial functions.

In general, for rural areas counts that different sectorial policy objectives should become part of one policy on the rural area. Implementation and realization are guaranteed by performance contracts instead of fixed amounts of money. As a result, different sectorial budgets are merged into one budget; the *Investeringsbudget Landelijk Gebied* (Investment Fund Rural Areas).

For nature conservation, new policies imply a central position of the provinces in the development of the Dutch ecological network. Provinces get the political and financial responsibility for nature development.

Wetland Corridor projects

The realization of the Wetland Corridor is often combined with other projects. Acquiring desired areas is easier if it

is combined with different aims. Sometimes nature development is part of land consolidation projects, and is combined with water management or urban expansion. Correspondingly, the status of realization is different. While realization of the Wetland Corridor in the area of Krimpenerwaard is in progress, other parts are still untouched. Some important examples are mentioned below.

Development perspective

The National Spatial Strategy mentions regional policies for specific areas. The Green Heart is one of them. Different specific goals are put together in this regional policy. These specific goals contain for example the National Landscape Green Heart, which is an area enclosed by the Randstad, and the wetland nature corridor, which connects the Lake IJ with the Biesbosch (Ministerie van Volkshuisvesting, 2004). Recently, the provinces of North-Holland, South-Holland and Utrecht, and partners worked out the national policy in a development perspective (Witsen, 2006). The scale of this development perspective is very large compared to other regional policies. Therefore different projects have been mentioned. The Wetland Corridor is one of ten projects with high priority.

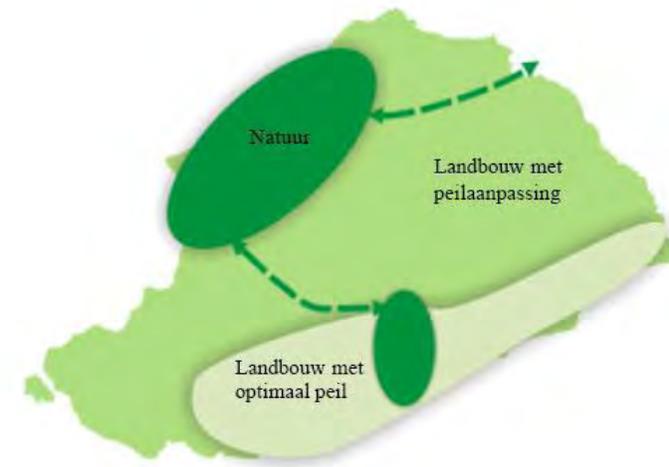
De Venen

Different regional policies cause new developments in De Venen. The polder area is part of the area covered by the Strategic Green Project De Venen. This plan grounds in national policy which aims for realization of the EHS in the region. The plan is executed by a foundation in which

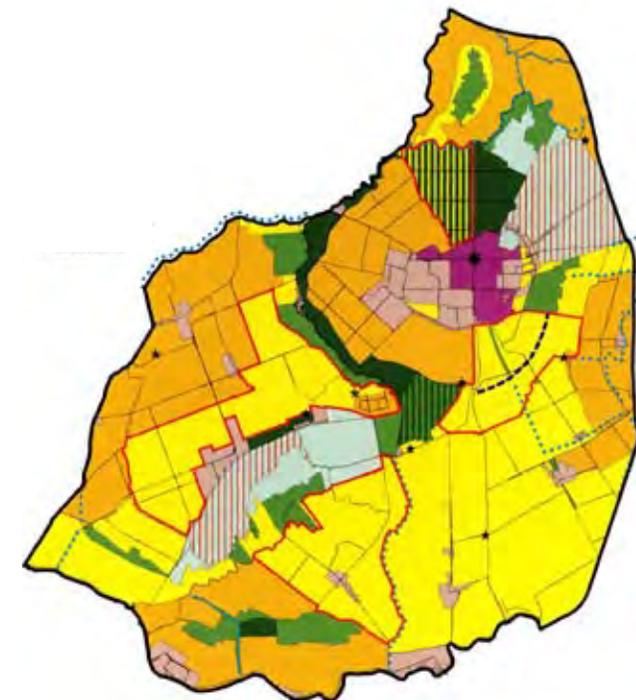
different parties are represented. The foundation aims for 1.) a coherent plan for nature and recreational development, 2). maintenance and reinforcement of a sustainable agriculture in appointed areas, and 3). realization of good environmental and water quality. (Programmateam De Venen, 2006).

Krimpenerwaard

The approach in Krimpenerwaard is different from De Venen. After the publication of the original framework plan, policies changed. To renew the plan, an agreement was made between different governmental agencies, farmers, nature conservation organizations and recreational parties. This agreement is the base for further detailed plans. Nature in regional policies is more a result of negotiation than top-down policies.



Veenweidepact Krimpenerwaard
Source: Veenweidepact Krimpenerwaard (2005)



Plan van aanpak De Venen
Source: Stuurgroep De Venen (1998)

5.4 Choice of case study areas

In previous paragraphs, the landscape of the Wetland Corridor and related policies are discussed. Based on this information, we are able to make a deliberate choice for local case study areas.

We noticed that the location of the Wetland Corridor is logical, concerning the aim of nature policies to connect different large wetland areas in the Netherlands. The corridor indeed connects different wetland areas of the Green Heart area. Moreover, the connection is planned in the lowest area, which is very vulnerable for subsidence.

On the other hand, the direction of the Wetland Corridor does not follow the structure of the landscape, which is parallel to the rivers. In case the Wetland Corridor was situated in this direction, the major wetland areas of the region would remain fragmented.

The ecological aim of the Wetland Corridor will not be questioned. We assume the right ecological targets have been chosen and the corridor will make migration between areas possible for intended species. The aim of this research is to increase the social benefits of nature by also realizing ecological purposes.

The Wetland Corridor crosses different landscapes. Most of the area is covered by peat cultivations. This area is cut through by rivers on several places. Some areas are reclaimed lakes, mostly just outside the projected location of the Wetland Corridor. Planning and design solutions might be different in different landscapes and the interaction between them is interesting. Especially the natural levees of the rivers are no

dependent landscape, but are strongly related to adjacent peat cultivations. To fully understand roles of nature in the landscape of the Wetland Corridor, local case areas should be located in different landscapes.

Fragmentation is one of the core problems to tackle by ecological networks. Especially infrastructure causes fragmentation. The Wetland Corridor is crossed by highways, railways, rivers and canals. Besides, built strip developments along water courses result in many additional obstacles. The design of the Wetland Corridor is crucial on crossings with barriers.

Finally, urban influences on nature are very characteristic for the metropolitan landscape of the Green Heart. According to the design philosophy of this study, the interaction of urban centres and the Wet-

land Corridor is important. A choice of case areas should be based on the chances for a recreational use of nature as well.

Based on the position of the Wetland Corridor in policies, different landscapes typologies, fragmentation by infrastructure and residential strips, and the existence of urban centres, the following cases are chosen:

- Krimpenerwaard
- Oude Rijn
- Bovenlanden
- Polder Groot-Mijdrecht

The table below gives an overview of differences and similarities between the four local case areas.

Area	Position	Landscape	Barriers	Urban centres
Krimpenerwaard	Nature development area	Peat meadow and natural levee	River Hollandsche IJssel	Close to Gouda
Oude Rijn	Nature corridor	Peat meadow and natural levee	River Oude Rijn, highway A12, railway	Close to Woerden and Bodegraven
Bovenlanden	Nature development area / nature corridor	Peat meadow and reclaimed lake	Occupation strip along river Kromme Mijdrecht	Recreational area of Amsterdam
Polder Groot-Mijdrecht	Nature development area	Reclaimed lake	No major barriers	Towns of Wilnis, Mijdrecht and Vinkeveen

Differences and similarities between cases



Highways can be a major barrier (A12 south of Nieuwerbrug)



Activities along river Hollandsche IJssel make it hard for animals to pass (east of Gouda)



Facing along the shore forms a barrier on microlevel (Vreewijk)

Case study areas

- 
River landscape
 peat cultivations from the natural levee
- 
Peat landscape
 peat cultivations from peat streams and canals
- 
Landscape of reclaimed lakes
 cultivations of peat fields that are dig up or washed away
- 
major cities
- 
highway
- 
railway
- 
major river / canal
- 
routing wetland corridor







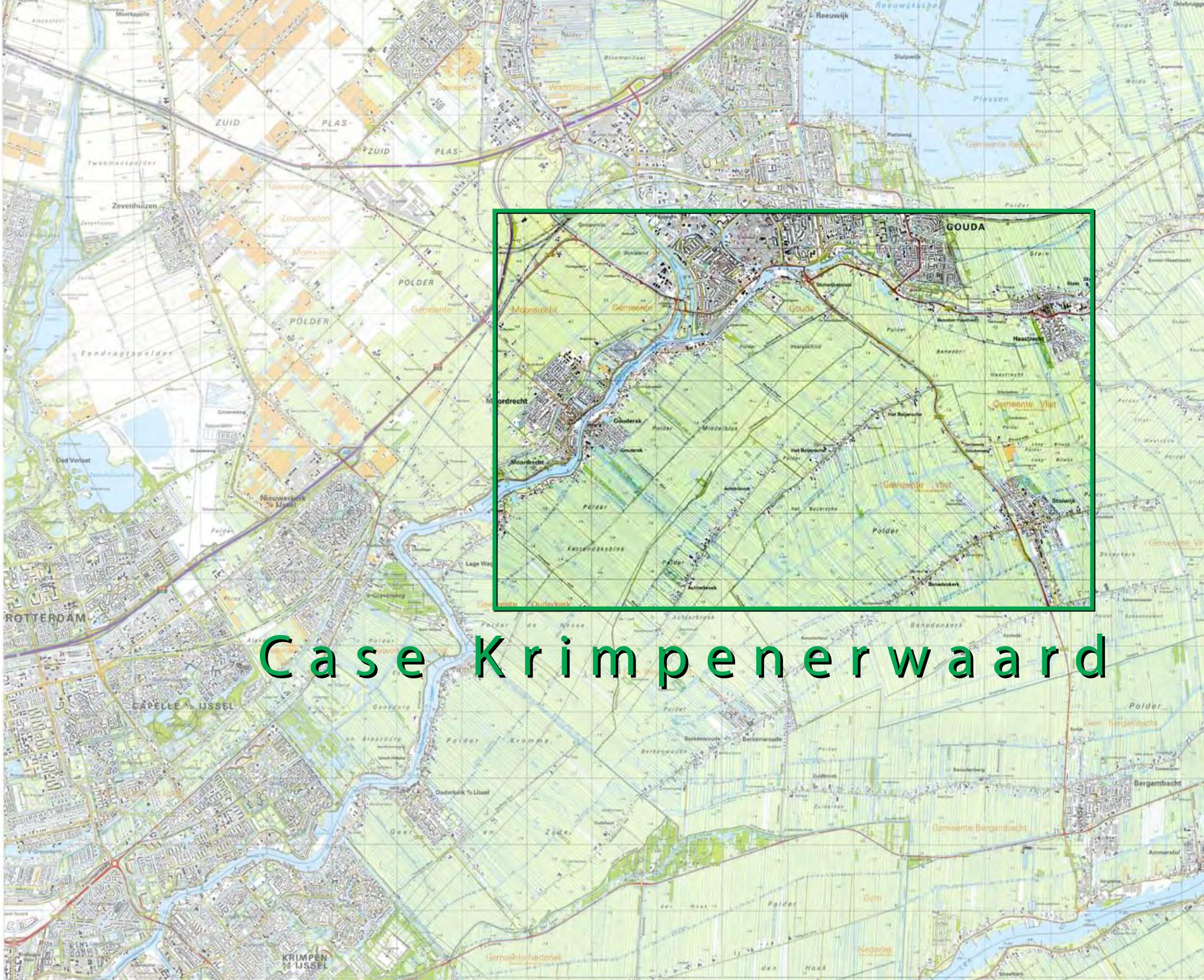
Case studies

6

interactions between roles of nature

Introduction

The wetland corridor is planned in the peat lands of the Green Heart. This typical Dutch landscape has a large cultural value. Moreover, the area has a major recreational function concerning its location in the 'backyard' of the Randstad metropolis. The wetland corridor therefore interferes with many interests and values of nature. The previous chapter discussed the ambition of the Wetland Corridor. This chapter approaches the design of the Wetland Corridor from practice. Four different local case areas have been studied to get insight in the interaction between different meanings of nature in the metropolitan landscape. We focus on three different values: the ecological value of nature (biodiversity), the consumptive value of nature (recreational) and the historical value of nature (the cultivation pattern). In the last paragraph, a comparison between cases is made and conclusions are made on the position of the EHS in the landscape.



Case Krimpenwaard

6.1 Case Krimpenerwaard

Case Krimpenerwaard is a representative example of the peat meadow landscape on the southern section of the Wetland Corridor. The landscape is very much determined by the presence of rivers, which results in a gradient between natural levees and peat meadows. The rural landscape of Krimpenerwaard is nearby urban nodes and therefore has a major recreational function.



Grassland reserves for meadowbirds are realised



The landscape is very much determined by the presence of rivers (east of Gouda)



"I rather keep dry feet" Protest against the development of mostly wet grasslands for nature conservation (south of Gouda)



Vista from the dike towards the peat meadows (west of Gouda)

Inventory



Apart from the enormous growth of the city of Gouda, landscape patterns did not change for centuries. In red, former 'boezemlanden' are highlighted.

The Krimpenerwaard is the area between the rivers Hollandsche IJssel and Lek. The area consists of peat lands surrounded by a tight natural levee. Residential strips follow the natural levee and the cultivation bases along main watercourses. The focus is on the area south of Gouda, in which villages of Gouderak, Stolwijk and Haastrecht and several small strip settlements are located.

The land use of the area is a low dynamic, compared to the intensively used area north of the river Hollandsche IJssel. The river is the border between the urbanized area of Gouda and Rotterdam and the rural countryside of the Krimpenerwaard. Because of the near metropolitan area, the countryside is influenced by metropolitan land uses.

Many people live in the Krimpenerwaard, but work on the other side of the river and there is a high recreational pressure on the area.

Landscape

The Krimpenerwaard is a former peat bog like other peat landscapes of the Green Heart. By cultivation, cropping, farming and continuous draining, the area settled till the current elevation under sea level and also under the river level. Pumping is necessary to keep the area dry. Ditches between small and long parcels drain into main watercourses (same water level). These main watercourses

drain into the river Hollandsche IJssel. Every polder used to have its own water management system. Farmers stored drained water at certain 'boezemlanden' from where the water was discharged on the river. However, the area of Stolwijk had no possibility to discharge the water, because its located in the middle of the polder. Therefore, Stolwijk got a strip of boezemlanden from the centre of the polder to the village of Gouderak where the water was drained into the river. Nowadays, these boezemlanden are still recognizable in the landscape by the present use as nature strips occupied with alder forests and grasslands with a high biodiversity.

Between Schoonhoven and Haastrecht, the peat river Vlist is located. This level of the river is higher than the

polder surface; the river is kept in its place by peat dikes. The river functions as an in-between step for the draining of the central part of the polder. Due to the dikes and the high water level, the river is a remarkable landscape element.

Land use

The land use of Krimpenerwaard is determined by its peripheral position in the Randstand metropolis. Although the cities of Rotterdam and Gouda are very close, the river Hollandsche IJssel is a physical barrier which guarantees the rural character of Krimpenerwaard. Especially cross-river connections on the west side are very rare; only a small ferry connects the village of Gouderak with Moordrecht and in the very south there is a bridge between Krimpen aan den IJssel and Cappele aan den IJssel. The eastern border near the city of Gouda is not as closed, but on the southern side the river Lek is a major barrier as well.

Agriculture

The land use of the area is mainly agricultural. Because of the soil quality, there is almost no cropping, but mostly dairy farming. Besides, soil quality varies and some areas are very vulnerable for settling of the soil. Partly, these areas are used very extensive, most times after nature conservation organizations acquired them.

Residential and commercial use

Cultivation bases along watercourses get a more resi-

dential function through the time. In former times, only farmers occupied these strips. Nowadays, local business people and wealthy people from cities move in. The residential centres still are the old towns, which are located on the natural levee, like Haastrecht. The history of many of these towns goes back to the middle ages. Haastrecht for example accommodates a convent and a castle.

Recreation

The Krimpenerwaard has a quite well developed network of recreational tracks. Most of them are designed as bike path or follow rural roads. The network opens the way to different nature areas. The southern part of the Krimpenerwaard locates two recreational areas. These areas are suitable for walking, cycling, sunbath and canoe.

Nature conservation

Natural areas in strips at the former 'boezemlanden'. These areas contain both poor grasslands and wetland forests. The grasslands accommodate different rare plant species and many insects. The forest is the habitat and breeding place of small mammals, insects, amphibians and birds. Most of the boezemlanden are inaccessible for people, but there are tracks through some of them.



The river Hollandsche IJssel forms a major barrier. Ferry at Gouderak



'Boezemlanden' inhabit special species of flora and fauna and therefore can be inaccessible (Middelblokboezem)



Meadows are characterised by agricultural use but also are a habitat for meadow birds. People can access and enjoy this landscape by small paths and picnic areas ((Het Beijersche)



Some 'boezemlanden' are accessible for people and provide in a magnificent view: the sky reflecting in the water, grazing cows and a glance of the tower of Moordrecht (Stolwijkerboezem)



Cultivation / Water System

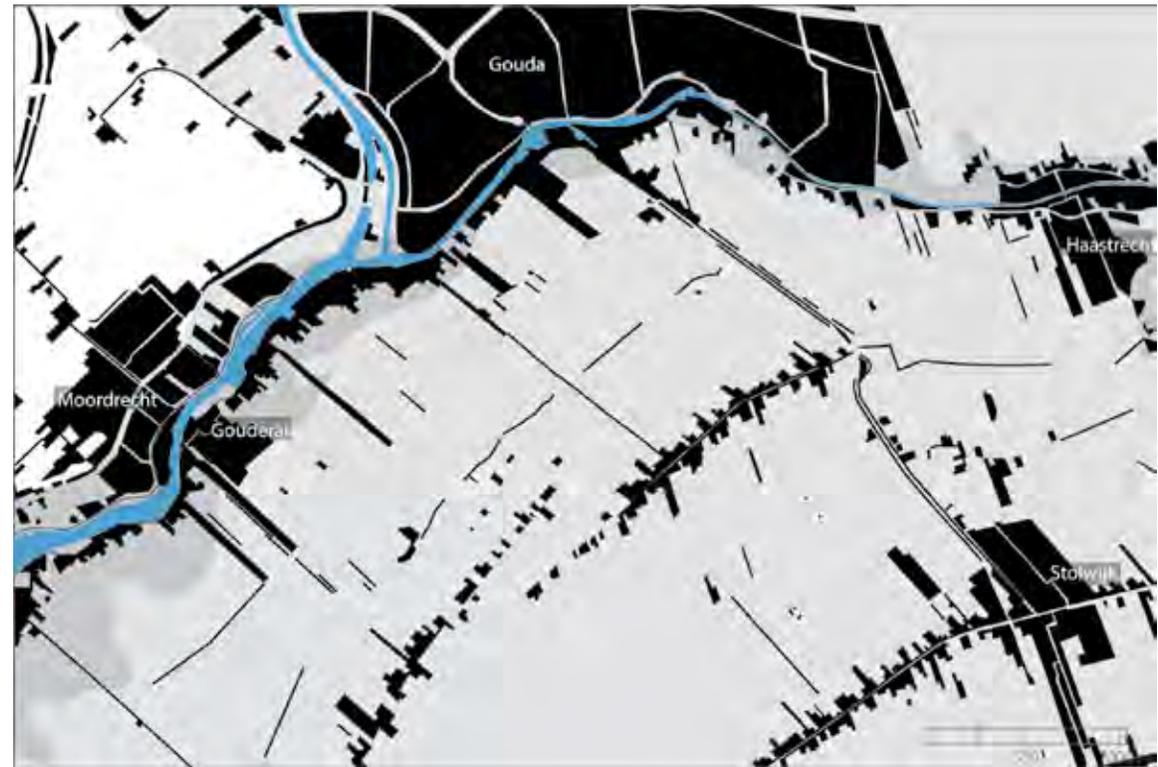
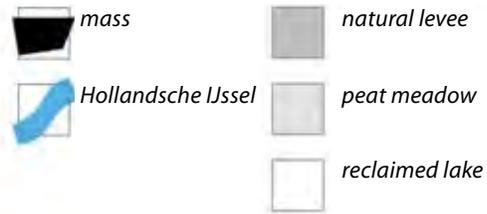
-  cultivation base
-  dike
-  backside dike
-  cultivation direction
-  Hollandsche IJssel
-  'boezemland'
-  main water course
-  secondary water course
-  town
-  natural levee (river clay)
-  peat meadow (peat)
-  reclaimed lake (sea clay)



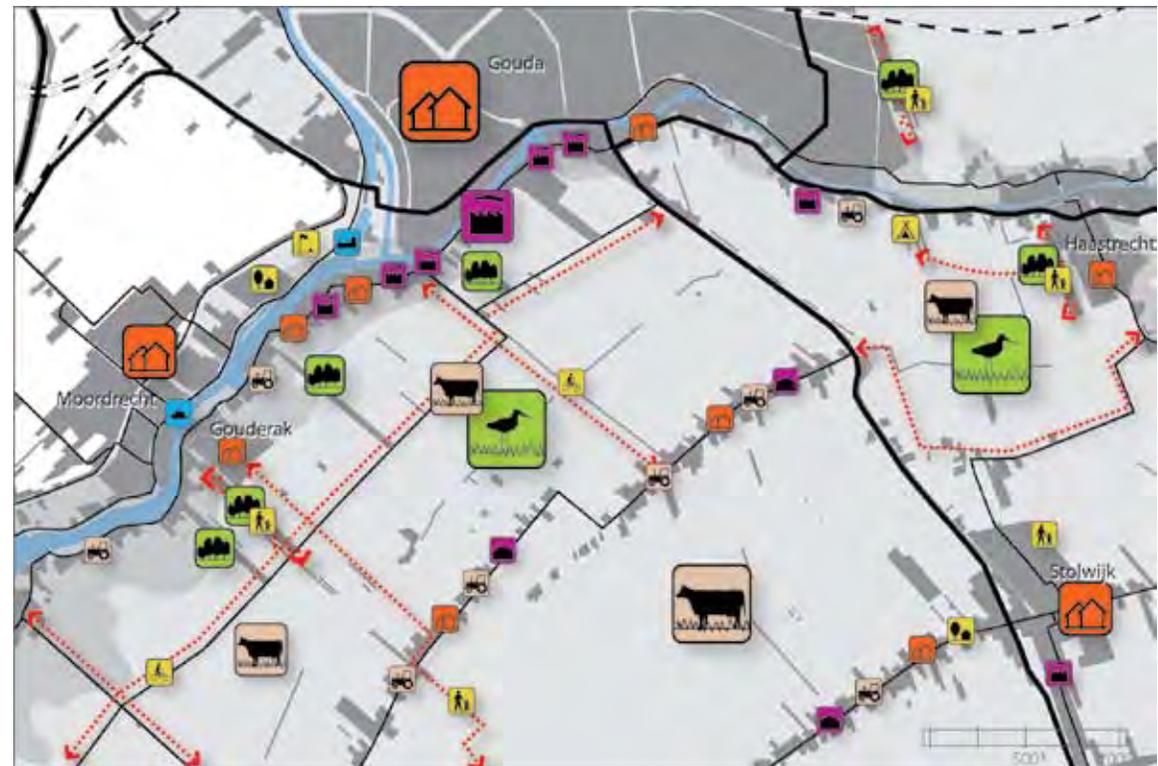
Road System

-  highway
-  railway
-  primary road
-  secondary road
-  local road / private path
-  Hollandsche IJssel
-  town
-  natural levee (river clay)
-  peat meadow (peat)
-  reclaimed lake (sea clay)

Mass



Activities (indication)



The area of Krimpenerwaard is divided in two landscape entities. The first area is the open peat landscape with cultivation bases. The second area is the natural levee of the river Hollandsche IJssel.

The quality of nature and landscape

The peat meadow landscape of Krimpenerwaard contains different landscape elements and historical lines. The present use of the *boezemlanden* as ecological valuable area links back to the history of the area and has also recreational qualities. Recreational qualities of the area are related to both the accessibility of a single boezemland and the experience of the landscape. Historical lines of planted dikes at the backside of cultivations as well as ditch pattern and water courses have large value concerning the cultivation history. Fortunately, local people and tourists are able to perceive this pattern themselves, while a zoning in natural and agricultural areas creates space for ecological key areas as well. Especially meadow birds benefit from an extensive use in ecological key areas. The presence of these birds and the fish in the ditches are important elements of the experience of nature as well for both children and adults. Different kinds of nature have been found in residential strips on cultivation bases. Nature on farmyards and planting in between yards is more dynamic, but is an important part of the cultural experience of the occupation bases. The other landscape of Krimpenerwaard is related to the river Hollandsche IJssel. Major dikes keep the water away from the peat cultivations. The quality of nature is limited in this area. Although dike and dike

buildings are characteristic for the landscape of the natural levee, nature is limited to a single reed bank and planting in gardens of houses. No important ecological qualities in this area, while recreational possibilities are not very appropriate because of the traffic on the road.

The development of ecological networks

From the year 2005 onwards, fifteen parties work together on the realization of the 'Veenweidepact Krimpenerwaard'. The project was started to find a solution for different problems: continuing subsidence, rising costs for water management, fragmentation of nature, and limited profitability of agriculture. Besides, the parties intend to conserve and develop the cultural landscape. The first start of the project was an outline plan which was founded in 1999. Then already, the realization of many new nature reserves was planned. In the new agreement these areas are clustered in the northern part. This area is very vulnerable for subsidence and therefore not suitable for agriculture. The water level in this northern area will not be lowered anymore. This is a result of the principle that land use should be adapted to the water level instead of the other way around. The southern part of the area is more stable and therefore more suitable for agriculture. The Veenweidepact Krimpenerwaard is appointed as one of the priority projects of the development perspective for the Green Heart, which means also financial priority for the province of Zuid-Holland.

As a result of the Veenweidepact Krimpenerwaard, dif-

ferent nature reserves are under construction. The project Berkenwoudse Driehoek is located in the case study area southwest of Stolwijkersluis. The area is designed as poor grasslands. Therefore the topsoil is removed. The small dikes are accessible for pedestrians and bridges are constructed to connect them.

Other projects contain lots of exchange, construction of bike paths and landscape elements for recreational purposes, widening of watercourses and development of reed filters. Many projects have a relation with the realization of ecological purposes.



Quality of nature from a landscape perspective

-  diversely planted yards in occupation strip
(high dynamic, intensively used)
-  open peat meadow
(low dynamic, extensively used)
-  woodland on former 'boezemland'
-  shrubs on backside side
-  main water course
-  main recreational track
-  main infrastructure
(highway / railway / primary roads)
-  EHS demarcation
(with indication of key areas)
-  towns



Reflection

The Krimpenerwaard is an interesting example of a combination of ecological purposes, water management, agricultural measurements, recreational plans and the conservation of the cultural landscape. Due to the regional approach, the integration of different purposes works out well. Besides, the design of nature is related to social objectives. Although the accessibility of peat lands for recreational purposes is often problematic, an elaborate bike path network is developed. Besides, there are different initiatives for the accessibility of nature and countryside for local people.

The urban pressure on the area is not as big as elsewhere. Therefore the development of a multifunctional rural countryside is rather easy. Although the expanding nature encounters some opposition from farmers, it is a solution for the problems with water management. The rural characteristics of the area are more or less conserved by nature development. The solution of the Krimpenerwaard however is not obviously a working solution for more urbanized areas.

Solutions

The Wetland Corridor crosses the Krimpenerwaard between the cultivation strips. There is no residential development in this area, while the peat lands are very vulnerable for soil settlement. This area can be developed as a nature core area.

Although there is no need for a landscape mosaic from ecological purposes, a mosaic of nature with other land uses might be the right solution for the development of nature for the inhabitants of the residential strip along the Hollandsche IJssel. The former Boezem-

landen, which are occupied by forest and natural grasslands, are already property of the landscape conservation agency.

The crossing of the IJssel is problematic, especially because of the regional road which is situated south of the IJssel. Because of the limited space available for a connection, application of the corridor concept is most promising. By cutting the bank of the road, mammals can cross the road underneath.



Sluices at Stolwijkersluis. The river Hollandsche IJssel is popular for boating



Paths out of towns leading into the countryside bring nature closer to home (Gouderak)

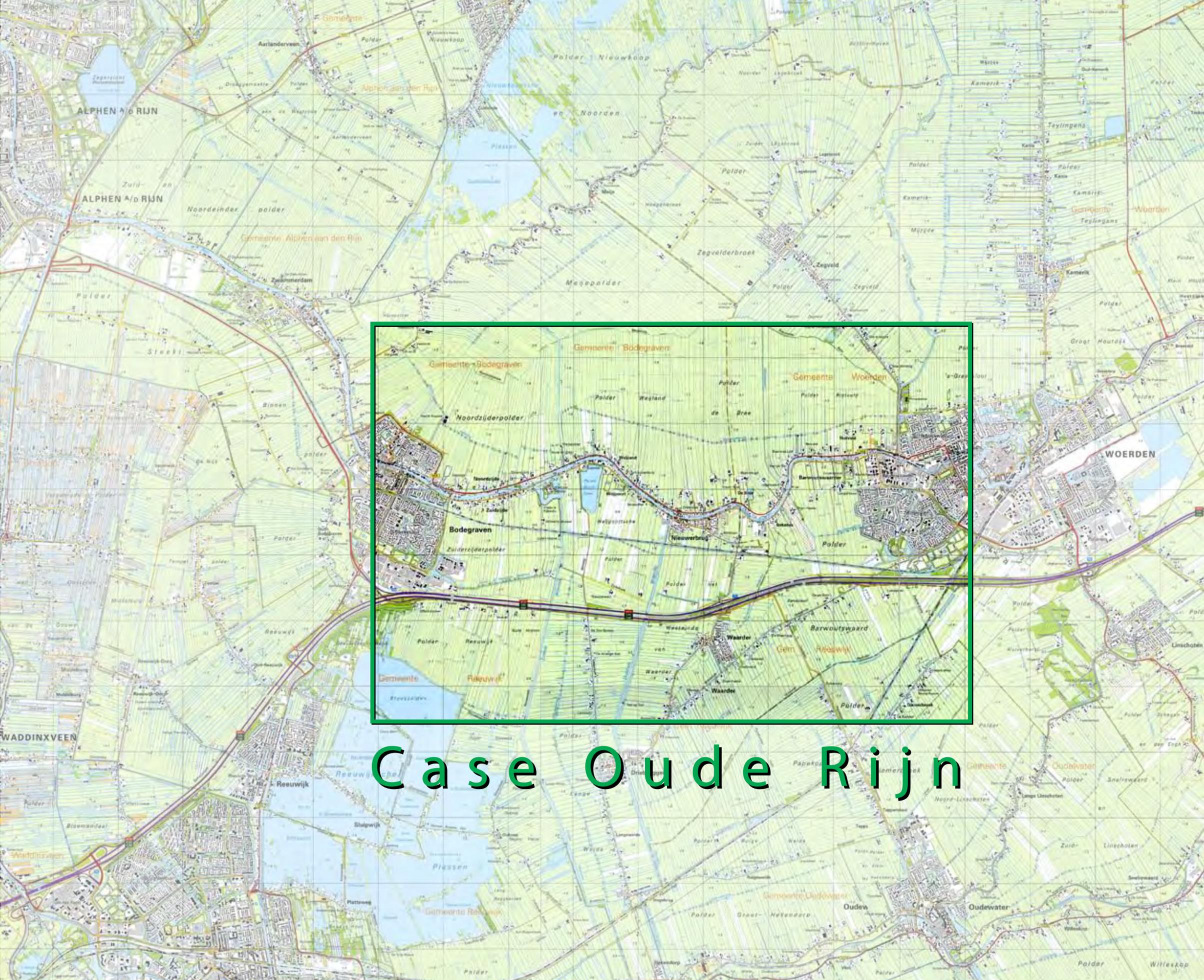


River Hollandsche IJssel forms a major barrier as it attracts industries and traffic (west of Gouda)



Open peat meadows and enclosed occupation strips, a view from the backside dike towards the river Hollandsche IJssel





Case Oude Rijn

6.2 Case Oude Rijn

The case of Oude Rijn has been chosen because of different reasons. From a landscape perspective, the natural levee of the river surrounded by peat landscape is an interesting combination. Besides, the existence of the towns of Woerden and Bodegraven asks for considerations on the availability of nature for people. Also main infrastructure of highway and railway which cross the area makes the investigation of the area relevant.



The highway A12 cuts through the peat meadow landscape and the route of the planned wetland corridor



The river Oude Rijn is popular for waterside dwelling and boating



Neighbourhood and countryside, Woerden



Fortress Wierickerschans, remnant of the Old Dutch waterline of defensive works, today accomodes a tourist center to promote the Green Heart region

Inventory



Metropolitan influences are widespread. Growth of the cities of Bodegraven and Woerden, railway and highway crossings, and sand and peat diggings that nowadays are lake areas

Woerden and Bodegraven are located between Utrecht and The Hague along the river Oude Rijn. Both towns are regional centres in a mostly rural area. The surroundings of Woerden and Bodegraven is characterized by several east-west structures, crossing the north-south direction of the wetland corridor. Most prominent is the occupation base along the Oude Rijn on the sediments of the river. Vegetation and buildings of this strip cuts through the openness of the peat lands, which are situated north and south of the natural levee. Transportation is oriented in this east-west direction as well. On the northern bank a regional road is situated. On the southern riverbank another busy road ex-

ists. The peat lands south of the Oude Rijn are cut through by railway and highway.

The water management of the area is characterized by a hierarchy with the river Oude Rijn as central ribbon. From the river Oude Rijn it is possible to let in and discharge water into or out of the polder area. This is done in two or more steps using a central watercourse to connect polder ditches to the river via sluices or pumps. To prevent subsidence, sometimes the water level around farms along the river is higher than in the field. This is especially necessary on those spots where the natural levee is very tight.

Landscape

The landscape of Oude Rijn is characterized by open peat lands which are interrupted by the natural levee of the Oude Rijn. Therefore a contrast exists between openness of the peat lands and the enclosed strip of the natural levee. There is a very wide view from the north bank on the northern peat lands, while the view on the southern side is limited because of residential development and a smaller scale of the landscape. The natural levee was the first strip of the area which became occupied. From there, the peat lands were cultivated. This was done by draining the area. A fine network of ditches connected to main watercourses trans-

ported the water to the river. However, due to soil settlement the river is nowadays higher than the peat lands and pumping is necessary to pull out the water.

For a long time the river Oude Rijn was the major transportation corridor. Before the time of the steamboat, barges were pulled forward by horses, which used pathways on the riverbanks. These pathways still exist and have a recreational function nowadays.

Fort Wierickerschans is a remnant from the Oude Hollandse Waterlinie (Old Dutch waterline of defensive works). In the 17th century, the waterline protected Holland against German, French and English invasions. Principle of the defensive works was inundation of the land. Although there was only 30 centimeters of water, it was enough to make the land too muddy to pass and too shallow to navigate. The Oude Rijn was a weak spot in the waterline, because it was a navigable entrance. After a successful defense in 1672, the governor of the Netherlands decided to construct the Wierickerschans. After construction, the bastion was altered several times. After construction of the Nieuwe Hollandse Waterlinie (New Dutch waterline) east of Utrecht, the bastion lost its function as defense work. However, it remained property of the Ministry of Defense until 1997. At that time, Staatsbosbeheer (Dutch Forest Service) became owner of the bastion. The bastion got a new function as recreational entrance to the National Landscape Green Heart.

Land use

The land use in the area of Oude Rijn is organized in east-west direction. The area can be subdivided in a cultivation strip along the river Oude Rijn and an agricultural area north and south of this strip. In the southern part, the area is cut through by the highway A12 parallel to the Oude Rijn.

Commercial activities

Many trade and industry companies occupy the north bank of the river Oude Rijn. These companies chose this location because of transport possibilities by water. Many companies have their own yard along the water. This development was not possible on the south side because of the 'jaagpad' on the south bank.

Residential development

Closely related to commercial activities is the existence of labour houses on the north bank of the river and in the village of Nieuwerbrug. On the backside of the commercial buildings the road is situated. On the other side of the road originally the farms were located. Many of them still exist, but new houses have been built on both sides of the road. Where the natural levee is wide, farms are located on a distance from the road, while new houses have been built close to the road. Besides to this strip development, the towns of Woerden and Bodegraven are located on the natural levee, like the village of Nieuwerbrug.

Other villages are situated in the peat lands along their cultivation base. Most times these villages originate in the farm strips. Around the Reeuwijkse Plassen, different luxury houses are allocated.

Agricultural

The use of the peat lands is mainly agricultural. Because of the soft soils, only use as grasslands is possible. Most farmers therefore are dairy farmers. Many farmers have additional incomes from different landscape and nature conservation activities.

Recreational

The recreational network of the area is limited. Along the Oude Rijn, the historical 'jaagpad' is used for both cycling and walking. Fortress Wierickerschans is used as a recreational centre. Different parties work together to develop an information centre about the Green Heart. Catering, events, a countryside shop and education will be combined.

The peat lands north of the Oude Rijn are inaccessible. There are no recreational tracks or other possibilities to enter the area. The peat lands at the southern side are accessible by country roads and a simple cycling track. However, around the Reeuwijkse Plassen more to the southwest, there is a green recreational area including boating, cycling and walking possibilities. This area contains ecological values as well.

Because of the coarse size of the networks in the peat lands, there are barely possibilities for a short walk. However, day recreation is possible on the southern side of the Oude Rijn.

Nature

The ecological value of the area is mainly spontaneous and combined with other land uses. Open peat lands north of the Oude Rijn are an important area for birds;

one of the most important breeding areas of Europe. The nature along the Oude Rijn exists of small, extensively used river banks or small fields. Moreover, some places are wooded. The peat lands south of the Oude Rijn are like the northern peat lands interesting for meadow birds.

The area of the Reeuwijkse Plassen is an important wetland for water birds.

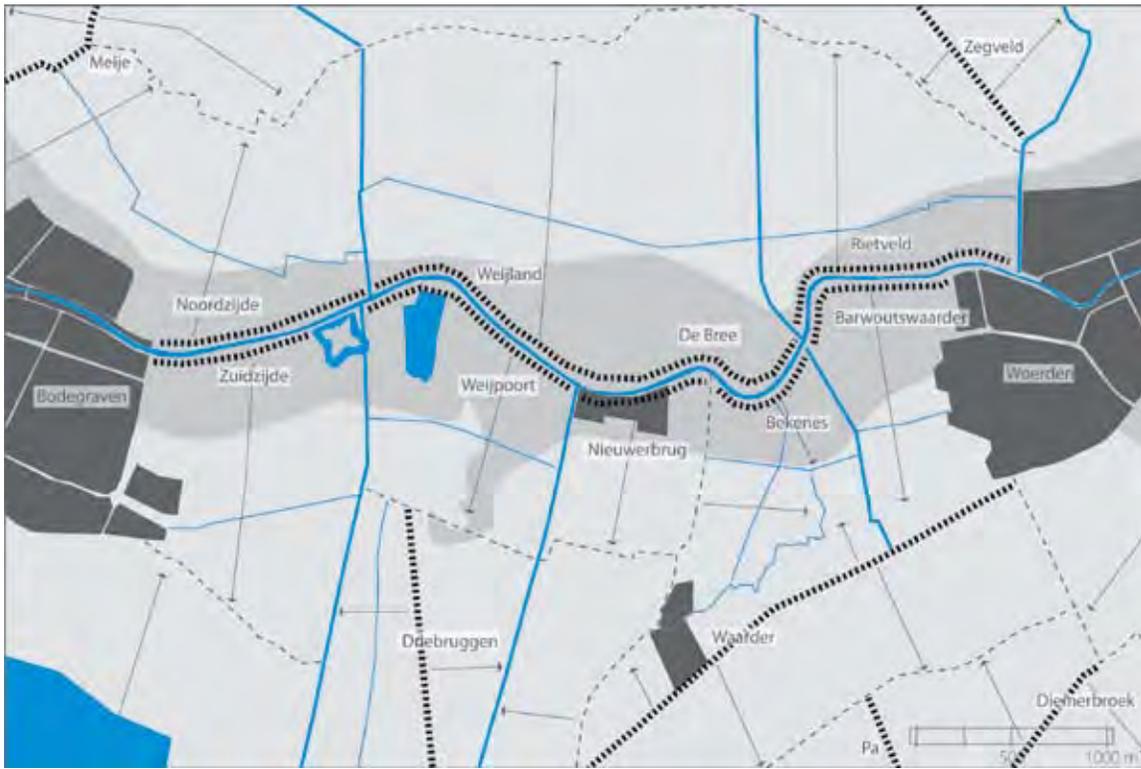
The two major watercourses south of the Oude Rijn are ecologically valuable because of reed strips along their banks. Some wooded dikes on the backside of cultivations and yard planting around farms form a diffuse green network.



River Oude Rijn as cultivation base. Historical farmsteads are fronted to river and road (west of Woerden)



River Oude Rijn as dwelling area. New housing is realized between river and road (near Nieuwerbrug)



Cultivation / Water System

-  cultivation base
-  dike
-  backside dike
-  cultivation direction
-  river Oude Rijn
-  fortress Wierickerschans
-  main water course
-  secondary water course
-  town
-  natural levee (river clay)
-  peat meadow (peat)



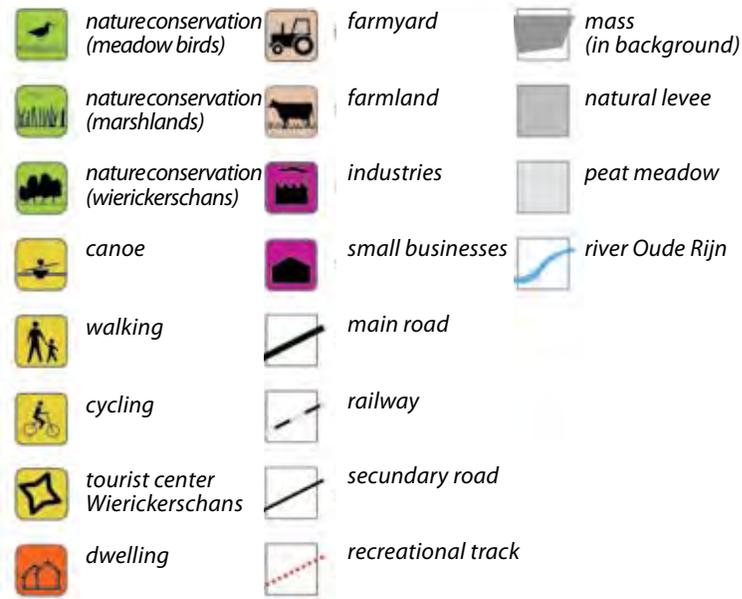
Road System

-  highway
-  railway
-  primary road
-  secondary road
-  local road / private path
-  Oude Rijn
-  town
-  natural levee (river clay)
-  peat meadow (peat)

Mass



Activities (indication)



The quality of nature and landscape

The area of Oude Rijn can be divided in three different areas. The northern part of the area is a very large and open but inaccessible entity. The ecological value is related to the importance of the area for grassland birds. Dikes and water courses have an ecological and cultural historical value, although perception is very limited due to inaccessibility. The ditch pattern and the shape of the parceling are very characteristic for the peat cultivations. The presence of water is special form different perspectives.

The second area is the strip along the Oude Rijn. This area is mainly perceived from the road or from the historical jaagpad along the Oude Rijn. Especially from the northern bank, many views on the peat lands are possible. Several small parcels along the Oude Rijn are extensively used for keeping domestic animals, as small woodland or as a wild garden. Orchards and planting in farmyards are other examples of small scale nature in the strip. The fortress of Wierickerschans is a special place in the area because of a combination of ecological, historical and recreational qualities.

The third area exists of the southern peat cultivations. This area is very similar too the northern peat lands, except from its smaller polder entities and better possibilities to enter the area. Several cultivation bases nowadays form strips with houses and farmsteads. Besides, also spread farmsteads are part of the area. Nature is found along transportation corridors: poor grasslands along the railway and lanes of trees and rough grasslands along the highway. The waterline of defense is the core of nature in the area. Two major

watercourses (Wierickes) are valuable from an ecological, a landscape-historical and a recreational perspective.

The development of ecological networks

The Wetland Corridor is influenced by many plans. Three of the priority projects of the Development Perspective for the Green Heart come together in this area. Firstly, the Wetland Corridor crosses the area (the reason this area is subject of this study). The peat lands north of the Oude Rijn will partly be developed as a new nature reserve. From this area a tight corridor should cross the densely occupied natural levee and the river at the location of the Fort Wierickerschans. From here the corridor follows the Enkele Wiericke (one of the major watercourses of the area) to the south. After crossing the highway, it connects to the Reeuwijkse Plassen area.

Secondly, the provinces mention the area as a “window area”. In these areas, large ‘green’ landscape entities of the Green Heart come together. In case of the area Oude Rijn these large entities are the peat lands of the Venen and the peat lands of de Waarden (the southern part of the Green Heart). Window areas also have a function as recreational transfer points. Related to this “window plan” the national government is working on the lay-out and view from the highway A12.

Finally, a plan is made to increase the spatial quality of the natural levee of the Oude Rijn. All these plans come together and influence each other. They determine the realization of the Wetland Corridor.



Northern area, inaccessible meadows are important for grassland birds



Along Oude Rijn, cultivated strip with small orchards and parcels for domestic animals



Southern area, an alternation of meadows and occupation. Two main water courses (Wierickes) are very valuable



Quality of nature from a landscape perspective

-  *diversely planted yards in occupation strip (high dynamic, intensively used)*
-  *open peat meadow (low dynamic, extensively used)*
-  *fortress Wierickerschans*
-  *shrubs on backside side*
-  *main water course*
-  *main recreational track*
-  *main infrastructure (highway / railway / primary roads)*
-  *EHS demarcation (with indication of key areas)*
-  *towns*



The implementation of the Wetland Corridor is quite delicate in the area of Oude Rijn. The corridor encounters different barriers like the strip development along the river Oude Rijn and the highway A12. The robust corridor changes in a narrow and vulnerable line through the landscape. It's a very basic solution full of obstacles. This corridor does not reflect the principles of the Wetland Corridor.

Moreover, a tight corridor does not interact with the surrounding landscape, apart from Fortress Wierickerschans. The proposed central position of the area for recreation and the other activities in the reclamation strip asks for a complete strategy. Because of the recreational transfer point, elaborate attention for a recreational network is desirable.

The different meanings of nature are spatially separated in the area of Oude Rijn. Ecological nature is situated perpendicular to the residential strip on the natural levee. Therefore, social benefits are very low. On the other hand, the limited recreational network is almost isolated from nature. The historical jaagpad is intensively used, but the appearance of nature and landscape are quite limited here, while the single route through the peat meadow landscape ends in a business park. Although the Wetland Corridor follows a section of the former waterline of defenses, this restoration of the cultural landscape seems an incident more than a conscious attempt to combine different issues. In our view, this restoration of the waterline is a great chance to combine ecological, cultural and recreational use.

In conclusion, the network of watercourses and his-

torical lines in Oude Rijn is very valuable and has potential qualities for the development of a natural landscape.

Solutions

The construction of the Wetland Corridor is a difficult task where it crosses the Oude Rijn. By using lines in the landscape, especially main watercourses, a framework for a permeable mosaic can be created. The scarce open connections between the northern and southern open area can be conserved and developed as a nature corridor.

Fortress Wierickerschans will be the entrance to the Green Heart, but the recreational network is limited. Especially at the northern riverbank, there are no possibilities to enter the landscape. The development of an ecological network can be combined with a landscape design of recreational tracks.

Farmyards can be transformed to residential areas. Here a combination with nature development on parcels behind the former farm is possible. Profits of residential development can be used for the development of nature parcels. These parcels contribute to the landscape mosaic. Also historical planting on farmyards might contribute significantly.



Although the historical jaagpad along the river Oude Rijn is intensively used, the appearance of nature and landscape are quite limited (west of Bodegraven)



The planned robust ecological corridor changes in a narrow and vulnerable line and lacks recreational benefits of nature. The corridor in this section is attached to a single water course (Enkele Wiericke)



Case Bovenlanden



6.3 Case Bovenlanden

The case area of the Bovenlanden is situated in the northern section of the Wetland Corridor. Only the south-eastern part of the area links with the Wetland Corridor. The other part is destined as a side branch. Contrarily to the former two cases, the peat meadow landscape of the Bovenlanden is arranged along a peat river and can be considered as only a little part of the peat meadow landscapes of Krimpenerwaard and Oude Rijn. Interesting here is a varied land use combined with ecological purposes.



The Bovenlanden are higher grounds between two reclaimed lakes. A backside dike keeps the water in to prevent subsidence of peatsoils



Formerly used as traderoute, nowadays the river Kromme Mijdrecht is used for recreational activities (Den Hoef)



Next to dairy farming, the land is also used for intensive cultures



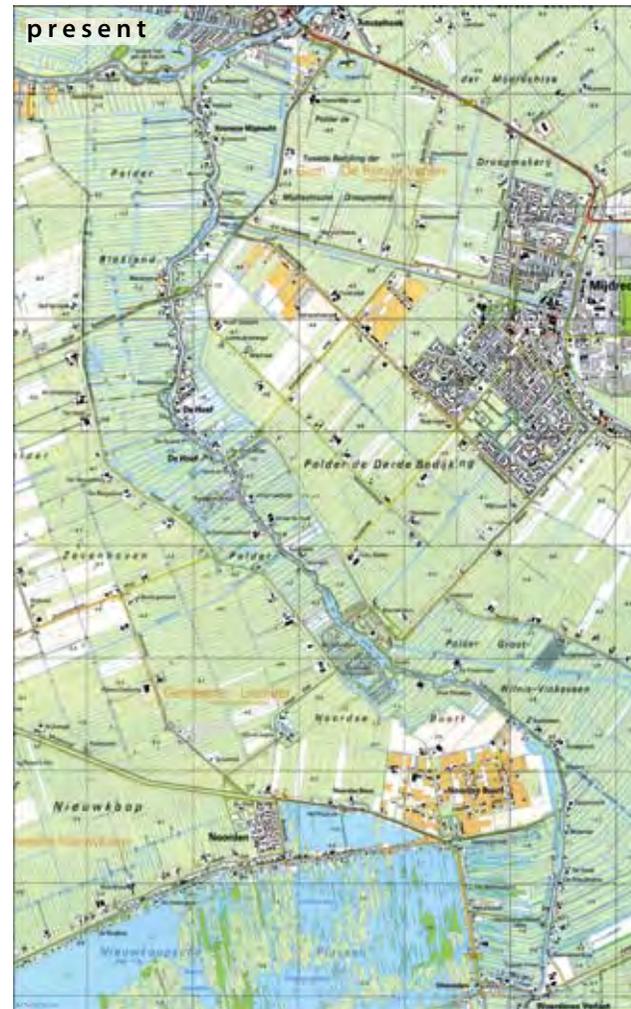
Holiday parks are new, urban elements in the landscape (Den Hoef)

Inventory

The area of Bovenlanden is located south of the Amsterdam agglomeration and west and southwest of Mijdrecht. The area exists of a strip of peat cultivations in-between two reclaimed lakes. The southern part connects to the central peat meadow landscape of Utrecht and Zuid-Holland. The peat river Kromme Mijdrecht is the central ribbon of the area. Along the river Kromme Mijdrecht the strips of linear villages are densely build, especially in comparison with other linear villages in the direct surrounding. Diversification of land use is greatly influenced by the settlement of holiday parks. Formerly, the river Kromme Mijdrecht was solely used for trade and industry; nowadays it is also used by water recreation and frequently crossed by pleasure crafts. This development transformed the

The hydrological situation of the area is highly influenced by the near reclaimed lake of Mijdrecht. The ground water flows to the lower areas. Dependent of the soils of the reclaimed lake this flow is strong or weak. The clay layers in this part of the adjacent reclaimed lake are substantial, which means the flow is not as strong as elsewhere. The peat meadows of the Bovenlanden get seepage water themselves too, because the water level of the Kromme Mijdrecht is higher than that of the adjacent land. Besides seepage water from the regional system comes up. The water quality of the polder is deteriorated by the inlet of water from the Kromme Mijdrecht. Inlet is necessary to maintain the water level in summer.

Dikes prevent flooding of the peat meadows. The dikes are made of peat, which becomes dangerous during dry periods. Recently, one of the dikes in the Bovenlanden area broke through and flooded part of the village of Wilnis.



In 1850, the reclamation of peat lakes in the northeast is still in progress. In recent decades, the Bovenlanden attracts many recreational activities like holiday parks.

Landscape

The Bovenlanden is an example of a polder consisting of peat cultivations. The 'Bovenlanden' is the area along the border of the reclaimed lakes of Mijdrecht: Wilnis-Veldzijde, Tweede Bedijking and Derde Bedijking. West of the Bovenlanden another reclaimed lake is located. This corresponds with the meaning of the word 'bovenlanden', which means the higher grounds between two reclaimed lakes (Stichting voor Bodemkartering, 1969). When we talk about the Bovenlanden, we mean the specific area along the polders of Mijdrecht.

When people extracted the peat from the present polders of Mijdrecht, they left a strip of land along the river untouched. Probably they left it because of the salt in the soils and/ or to prevent dike breakthrough. Although the peat is not exploited, people dug the peat along the watercourses in some areas. Accordingly, watercourses in these areas cover almost 30% of the surface (Stichting voor Bodemkartering, 1969).

The landscape of the Bovenlanden forms typical peat cultivations. The area has a similar genesis as most of the meadows in the western part of The Netherlands. The basis of the peat cultivations is formed by an (embanked) peat stream or river; in this case this is the Kromme Mijdrecht. Along the stream the land on both sides is linearly parcelled in long and narrow agricultural parcels and divided by ditches. Farms are headed along the stream with their backs on the parcel. The end of the parcels is marked with a ditch and enclosing embankment perpendicular to the parcelling. From this ditch onwards

the water is drained in the direction of the stream.

Originally, the landscape is worked only by farmers, resulting in an agricultural landscape with a clear distinction between the front side and the back. The front is characterized as an enclosed strip along the stream with farms, planting, and some orchards. From the strip there are several side sights into the open meadow area, forming the backside of the peat cultivations. Sights here are open ended with wide views into adjacent polders, either peat cultivations or peat reclamations.

Land use

The bovenlanden show a very scattered pattern in land use. Traditionally grasslands are in use by dairy farmers, which still occupy most of the surface. But nowadays also very different activities happen in the area. The land use pattern of the Bovenlanden is very different from the large scale of the reclaimed lakes. A similar contrast repeats within the Bovenlanden when entering the strip along the Kromme Mijdrecht. This area is intensively used for residential and recreational activities. The river has an import recreational function, but there is also commercial shipping on the river. There are sluices on several places, combined with a bridge connecting the two sides of the river.

Recreational activities

Besides, small sites for day recreation are created along different water courses. These areas contain restrooms, sunbathe places, possibilities for fishing etc. Bungalow parks are allocated on several spots in the bovenlanden.

These areas follow the strip structure of the peat lands, interrupting the extensive view. A golf club is situated the same way, hidden behind trees and shrubs. But there also different activities like a ground bank.

Residential use

The area of Bovenlanden is densely occupied along the river Kromme Mijdrecht. Most of these houses are inhabited by urban people, who prefer the rural character of the area. These people use their property differently. Some own domestic animals for hobby, like horses. Others have vegetable gardens or maintain old orchards. Many people have their own boat as well, which are anchored along shores of the river.

Nature and landscape

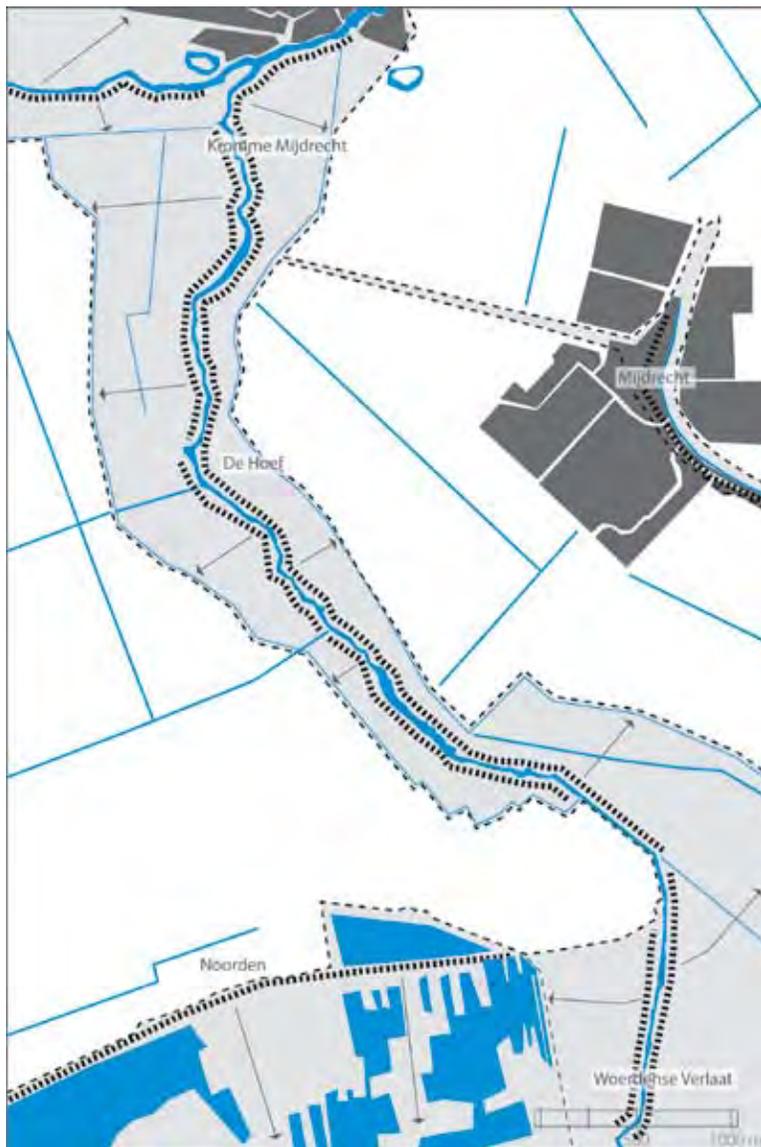
A local association works on the protection of the area and specific elements for landscape conservation purposes. This association owns several small lots in the area. They contain ponds, small groups of trees, reed vegetation. The association owns also a wetland strip along the road. Larger parts of the Bovenlanden are owned by Staatbosbeheer.



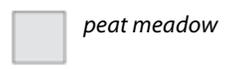
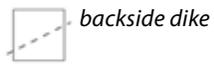
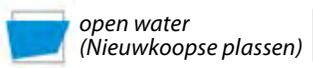
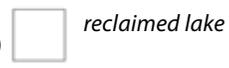
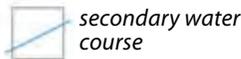
The metropolitan image. *Holiday parks interrupt the extensive view and 'green' character of the landscape*



The agrarian image. *Although nowadays many farmsteads are only used for dwelling the landscape did not change*

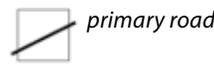
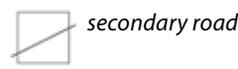
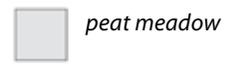
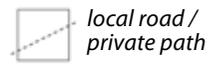
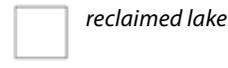


Cultivation / Water System

- | | | |
|---|--|--|
|  cultivation base |  river Kromme Mijdrecht |  town |
|  dike |  fortress |  peat meadow |
|  backside dike |  open water (Nieuwkoopse plassen) |  reclaimed lake |
|  cultivation direction |  main water course | |
| |  secondary water course | |



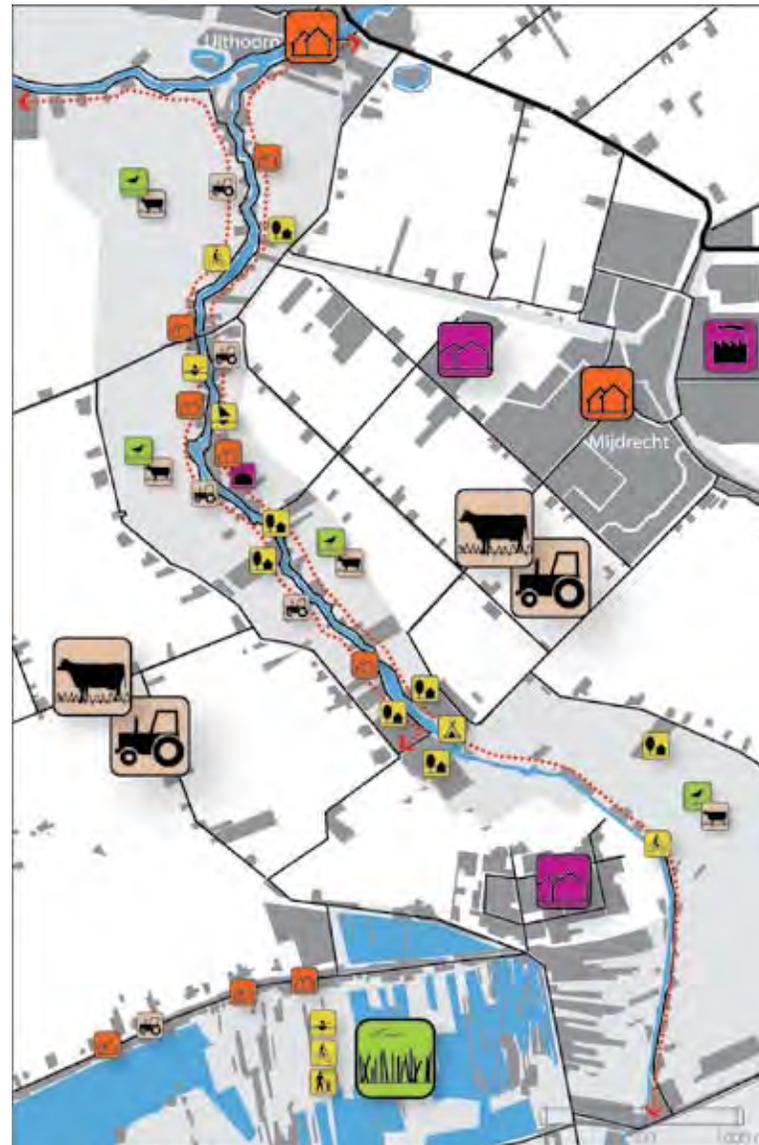
Road System

- | | |
|---|--|
|  primary road |  town |
|  secondary road |  peat meadow |
|  local road / private path |  reclaimed lake |
|  river Kromme Mijdrecht | |



Mass

-  mass
-  Hollandsche IJssel
-  peat meadow
-  reclaimed lake



Activities (indication)

-  main road
-  secondary road
-  recreational track
-  mass (in background)
-  river Kromme Mijdrecht
-  peat meadow
-  reclaimed lake

-  natureconservation (meadow birds)
-  natureconservation (marshbirds)
-  walking
-  cycling
-  canoe
-  boating
-  holiday park
-  camp site
-  dwelling
-  farmyard
-  farmland
-  greenhouses
-  industries
-  small business

The quality of nature and landscape

The spatial arrangement of the Bovenlanden is very clear. Central is the cultivation base and build strip along the river Kromme Mijdrecht. The landscape continues in as peat meadows at the back side of the building strip. At the end of the cultivation, the peat meadows are cut of by cultivations of reclaimed lakes.

The landscape of the cultivation base is enclosed. The natural value of the river Kromme Mijdrecht is very divers. It has an ecological value, especially because of reed banks. Besides, the river is used as a recreational track for boating, but also for cycling on both sides of the river. Finally, the central position of the river in the cultivation history is clear. Culture and nature meet in many farmyard, kitchen gardens and rest spaces.

The peat meadows in the back are a continuation of the varied land use in the cultivation base. The agricultural parcels are often extensively used. Many times landscape elements like small clusters of shrubs and remnants of old peat rivers interrupt the open and orderly pattern. These landscape elements have an ecological value, but are also very characteristic for the small scale peat meadow landscape. Most interesting for the development of ecological corridors is the back side of the cultivation. The small road on the dike has also a recreational function. Bungalow parks in the area interrupt the open landscape, but are a good example of recreational nature. The ecological value is probably limited, although this can be improved by design.

The development of ecological networks

The whole area is part of the EHS. Moreover, the area between the Nieuwkoopse Plassen and the Vinkeveense Plassen is part of the planned wetland corridor as well. Accordingly, the spatial strategy of the Province of Utrecht mentions a priority for nature conservation. The regional policy "Plan de Venen" mentions an area of 505 hectares for new nature for the Bovenlanden {Programmateam De Venen, 2006 #253}, of which is already 190 hectares acquired. This area is mainly destined for open grasslands for meadow birds. A wetland strip is planned on the east side of the area. Together with the plans for new nature a new water management plan has been developed. Natural designed riverbanks will be realized along the Kromme Mijdrecht.

The development strategy for the northern Bovenlanden is not clear yet. The combination of recreational zone and ecological corridor has not been worked out explicitly yet.



Old peat river



Principle to restore historical reed banks



Small landscape elements like reed banks, shrubs and clumps of woodland are not only valuable in terms of ecology

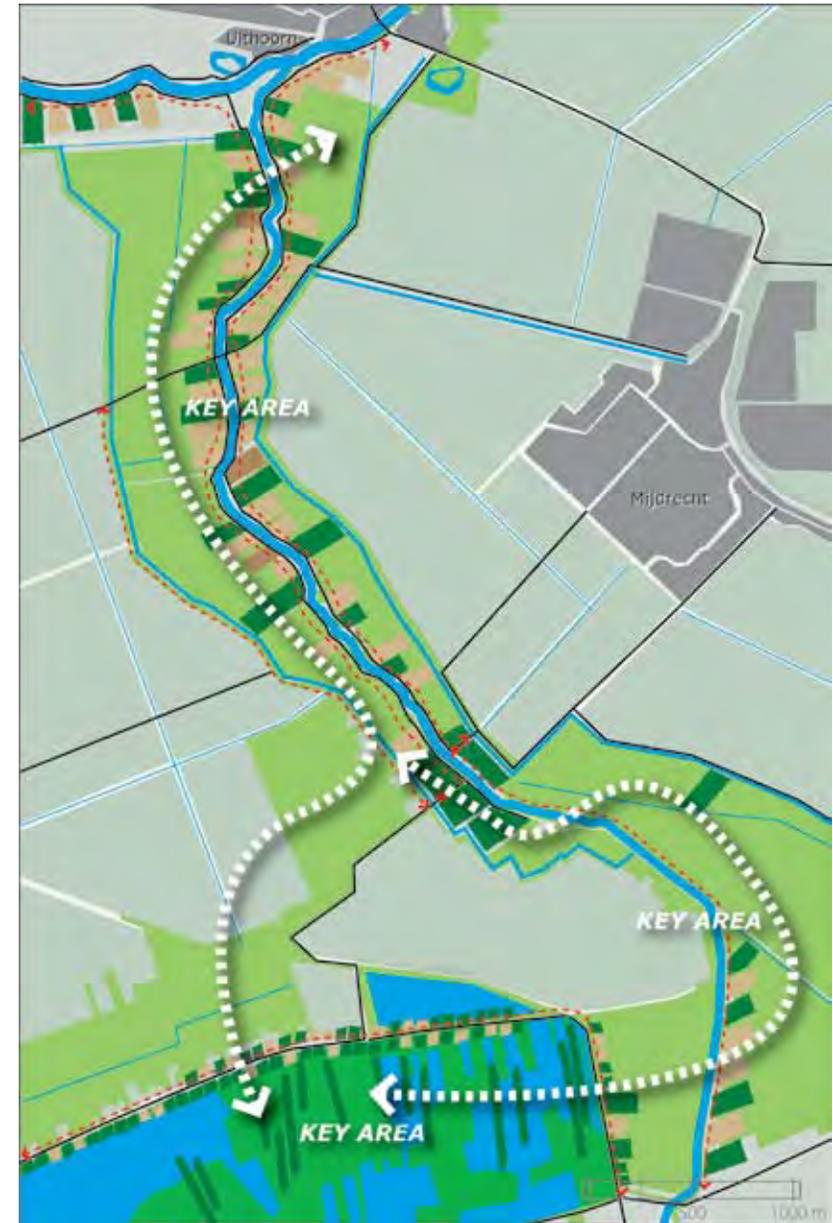


As the soil of old peat rivers contains clay, it is dig up and spread over the land, leaving wider ditches and clusters of shrubs



Quality of nature from a landscape perspective

-  *diversely planted yards in occupation strip (high dynamic, intensively used)*
-  *open peat meadow (low dynamic, extensively used)*
-  *marshlands (Nieuwkoopse Plassen)*
-  *shrubs on backside side*



-  *main water course*
-  *main recreational track*
-  *main infrastructure (highway / railway / primary roads)*
-  *EHS demarcation (with indication of key areas)*
-  *towns*

Reflection

The area of the Bovenlanden is a clear entity in the landscape. The use of the area is characterised by diversity. Besides, the parcelling has a continuous form and determines the development of the area. The central residential strip follows the cultivation base. The buildings in the residential strip are in close relation with the parcels behind these buildings. Changing the function of the land has unavoidable consequences for the use of the buildings. Besides, spatial changes take place per parcel.

Due to the diverse use, the Bovenlanden area is not obviously a nature core area. It now already shows many features of a mosaic landscape. The area can have an ecological function by connecting different nature core areas, like the nature area “De Groene Jonker” west of the Bovenlanden, the southern part of the Bovenlanden which is already obtained by the governmental agency DLG and a possible future nature reserve in the north of the Bovenlanden.

The natural landscape can be further developed by using the back side of the parcels. In this way, a small corridor parallel to the river will be created. Besides, a variety of land use gives the possibility for the development of more woodland and shrubs on parcels. This can be done by conservation and restoration of landscape elements. The Bovenlanden is used as a recreational area as well. Therefore a sufficient accessibility is desirable.

Solutions

The appointment of the entire Bovenlanden area as EHS was intended to create a working corridor between two wetland areas: Nieuwkoopse plassen and Vinkeveense plassen (Botshol). However, the diversity of the

Bovenlanden area is not taken into account by the robust zoning. A one-way ecological priority in the area is difficult to combine with the landscape characteristics and land use of the Bovenlanden area.

A solution for the incompatibility of policy and practice can be reached by two different views on nature in the Bovenlanden. Viewed from a narrow ecological perspective, a mosaic pattern is realistic: a corridor existing of different patches close to each other. These patches can possibly connect to each other by small corridors using (historical) landscape elements. Secondly, the nature of the Bovenlanden can be viewed holistic: the whole landscape contains nature values in different land use functions. A permeable nature landscape can be improved by increasing the quality of the nature value of existing land use. Agrarian nature management is only a first step in this development.



The Bovenlanden are characterised by integration. A historical backside dike is used as meadow and as cycling track



Nature and recreation along river Kromme Mijdrecht



Nature conservation strategies should take landscape characteristics into account. The cultivation base along the river Kromme Mijdrecht leaves a patchwork of different land uses close to each other.





Case Polder Groot-Mijdrecht

6.4 Case Polder Groot-Mijdrecht

The case of Groot-Mijdrecht is very different from the cases in the peat meadow landscape. It has been chosen to explore the possibilities for the Wetland Corridor in a different landscape like the reclaimed lake of Groot-Mijdrecht. This case illustrates differences between landscapes and the need for landscape specific solutions. Besides, especially the southern part of Groot-Mijdrecht is very urbanized and nature therefore has an important recreational function.



Polder Mijdrecht: a very open grassland area, few ditches with low water table and spread farm yards

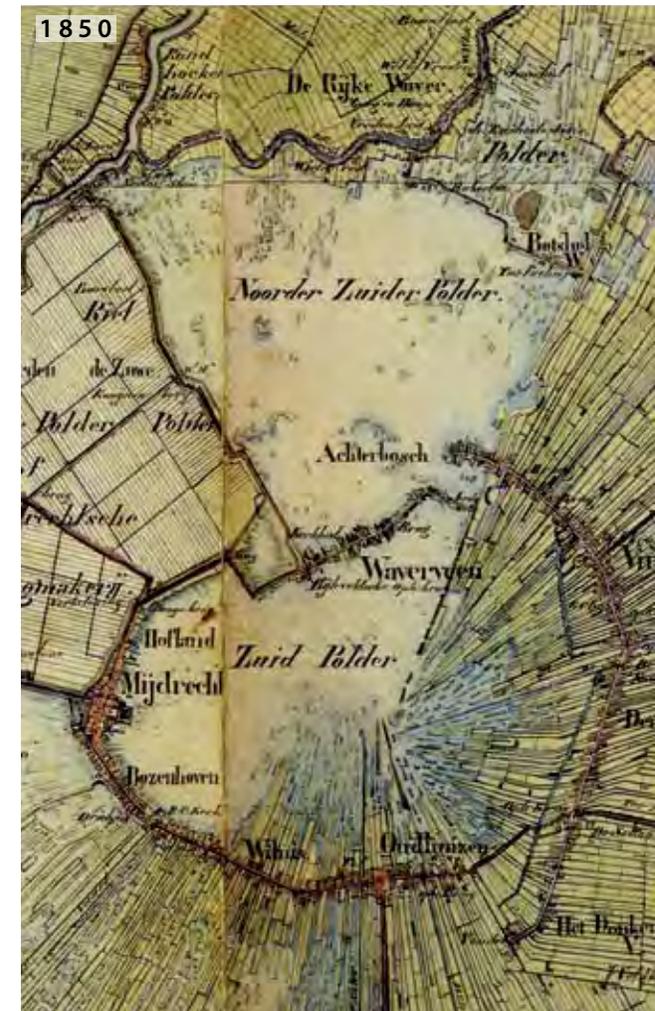


The occupation strip of Waverveen is a remnant of the former peat meadow landscape

Inventory

Polder Groot-Mijdrecht is located in the rural area between the cities of Utrecht and Amsterdam. Groot-Mijdrecht is part of the province of Utrecht and the municipality of "De Ronde Venen". The southern part of the polder is quite densely occupied; three towns are clustered around a rural area. The northern part is an agricultural area. East of the polder, the lakes of Vinkeveen are located. These lakes attract people for leisure activities, especially from the region Amsterdam. There are several similar polders west of the area. At little distance, the southern part of the agglomeration of Amsterdam is situated, consisting of the towns of Uithoorn and Aalsmeer, and the national airport Schiphol. On the other side, east of the peat lakes, the cities of the Gooi area are located. The provincial primary road N201 connects the different towns.

The polder is one of the deepest polder areas of the Netherlands. Related to the hydrological and geological situation, agriculture is under pressure. The polder is a reclaimed peat lake. The former lake originates from the exploration of the peat. Because of the low surface level of the polder compared with its surrounding lands, there is a lot of seepage water that has to be drained. The seepage water comes up, and breaks through the thin layer of clay. Besides, the seepage water at some places contains salt. Seepage also causes a shortage of clean water in adjacent lakes. But also the water quality in the region is threatened by the bad water quality of Groot-Mijdrecht. The situation of the water management has different consequences for the soils of the polder. Rests of the peat and the clay are acid and dry very quickly in sum-



Polder Groot-Mijdrecht forms a recent reclamation. This century, the peat cultivations of Mijdrecht, Wilnis, and Vinkeveen expanded towards the reclaimed land

mer. The draining causes settlement of the soil and differences in elevation with surrounding lands become bigger. Besides, the water level has to be lowered to continue agricultural use. By lowering the water level however, problems with seepage water will increase.

Landscape

Polder Groot-Mijdrecht has a rich history going 6000 years back when the area was part of a tide landscape. In this period, creeks and natural levees were formed, which nowadays lay as sandy ridges in the clay soils (Blijdenstijn, 2005). In the following period, the area became covered by a large peat bog extending major parts of the western Netherlands. From the 11th and 12th century on, the area around Mijdrecht - called "Ronde Venen" - was cultivated from the peat streams in a radial structure. Halfway, the labors constructed small dikes. Later on, these dikes became the building axis after the building of churches. The cultivation structure is removed by the exploitation of peat and following the reclamation of the resulting peat lakes. However, the dikes halfway the cultivation remain, because they were already occupied. That's why Waverveen, the old part of Mijdrecht and Wilnis is still on a little elevation in the landscape. Reclamation of the lakes happened during the 19th century. By this reclamation, 6000 thousand years old sea clay soils came to the surface. On top the rests of the peat that still remains. The land was divided in large blocks. The reclamation didn't result in the expected useful agricultural

land. From the beginning, salty seepage water, settlement of the soil and the quality of the soil (katteklei) frustrated agricultural use. Besides, the costs of drainage are high.

Land use

The area around Mijdrecht focused on recreation and industry. However, still most of the land of Groot-Mijdrecht is in use of agriculture. Agriculture is concentrated in the northern part of the polder. Recreational activities are clustered along the east border, around the peat lakes of Vinkeveen. The southern part is highly urbanized with both residential areas and industrial parks.

Nature

The important nature area "Botshol" is located northeast of the polder. Like the lakes of Vinkeveen, this area is a peat lake that was not reclaimed after exploitation of the peat. It is a varied area with open water, wetland forests and grasslands. The adjacent northern part of the eastern half of the polder is recently transformed in a nature area as well. Now it is still an open wetland area with some ponds and the original parcelling. In a couple of years however, wetland trees and shrubs will occupy parts of the area. The contrast with the existing polder will probably increase accordingly.

Recreation

The peat lakes of Vinkeveen are important areas for water recreation. Recreational houses and facilities are

built along the lake, also on the border of the polder. A strip of recreational houses crosses the lakes along the original watercourse that drained the peat lands before it became a lake.

The extensive nature recreation around the Waverhoek, in the northern part of the polder is different. People can watch birds from small parking lots along the border of the nature reserve. From the dike between the Botshol area and the polder, people can experience the nature of Botshol. From this dike also excursions by boat through the nature reserve are possible.

Agriculture

Most of the northern part of the polder is used by agriculture. The agricultural conditions of the reclaimed area are mostly bad. Therefore, most of the area is used for grasslands. But also for grasslands, the quality of the soil is bad and the water level high. Greenhouses were built on the natural levees left by the creeks in some of the polders west of Groot-Mijdrecht. But the soils in Groot-Mijdrecht are not as suitable for building as in these polders.

Residential and commercial use

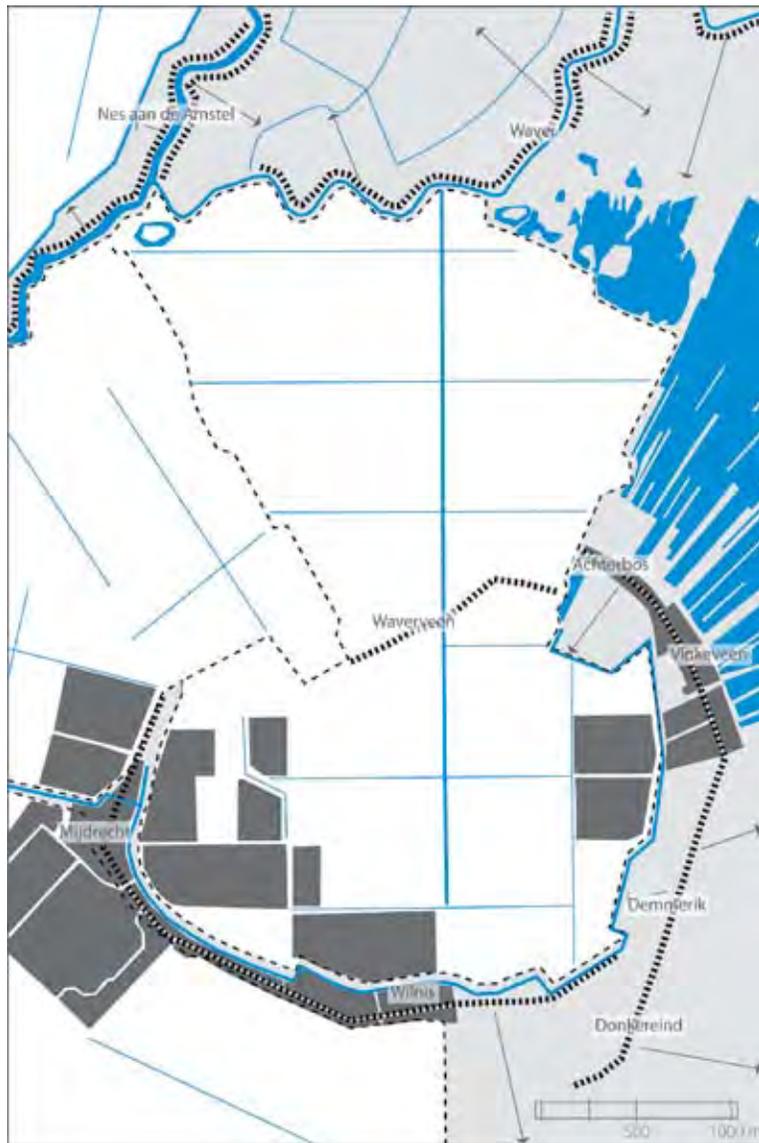
The small villages expanded substantially during the 20th century. Especially Mijdrecht became an important town with a big industrial park east of Mijdrecht and close to Wilnis. Accordingly, the area is no longer rural, but has different urban influences. At least the economy of the area depends on urban demands.



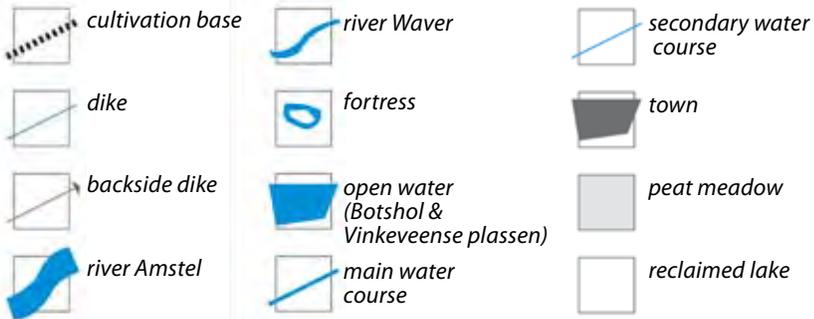
The agricultural landscape of the reclaimed lakes is not very attractive for recreation



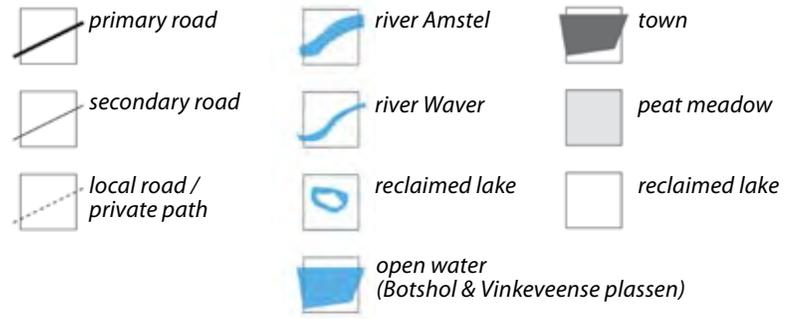
Border between peat river Waver and polder Groot Mijdrecht, surface levels differ 4 meter. The dike forms a recreative cycling route

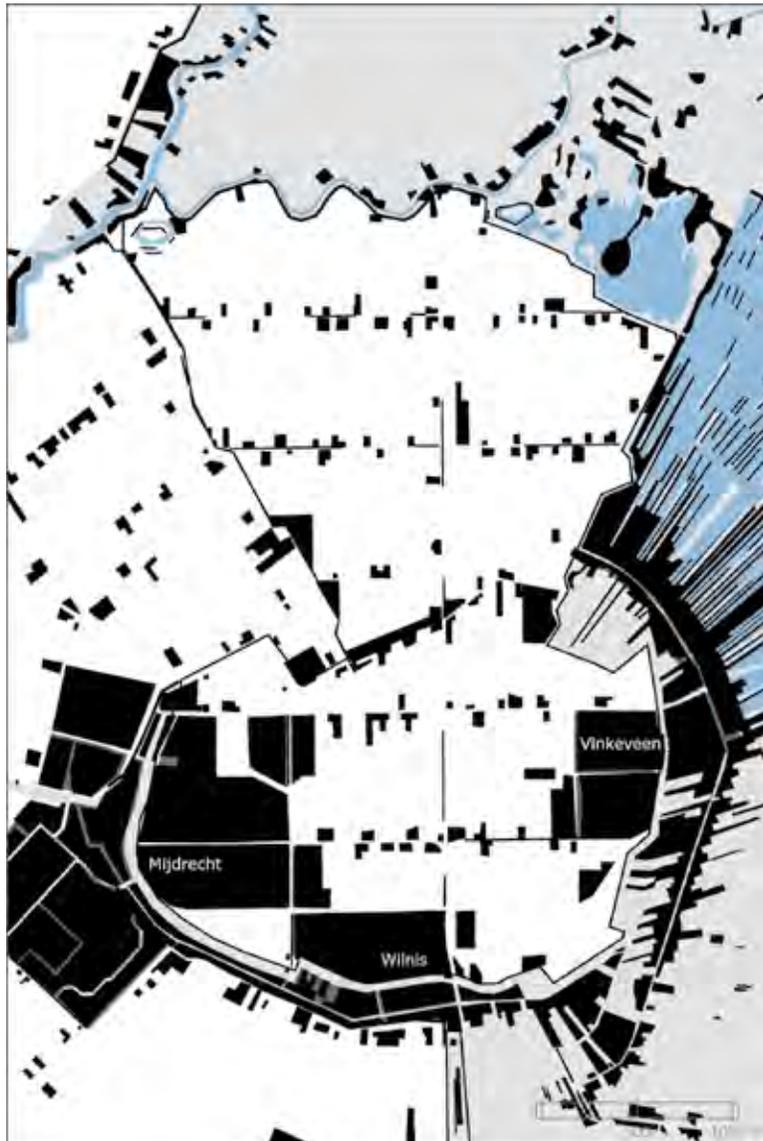


Cultivation / Water System



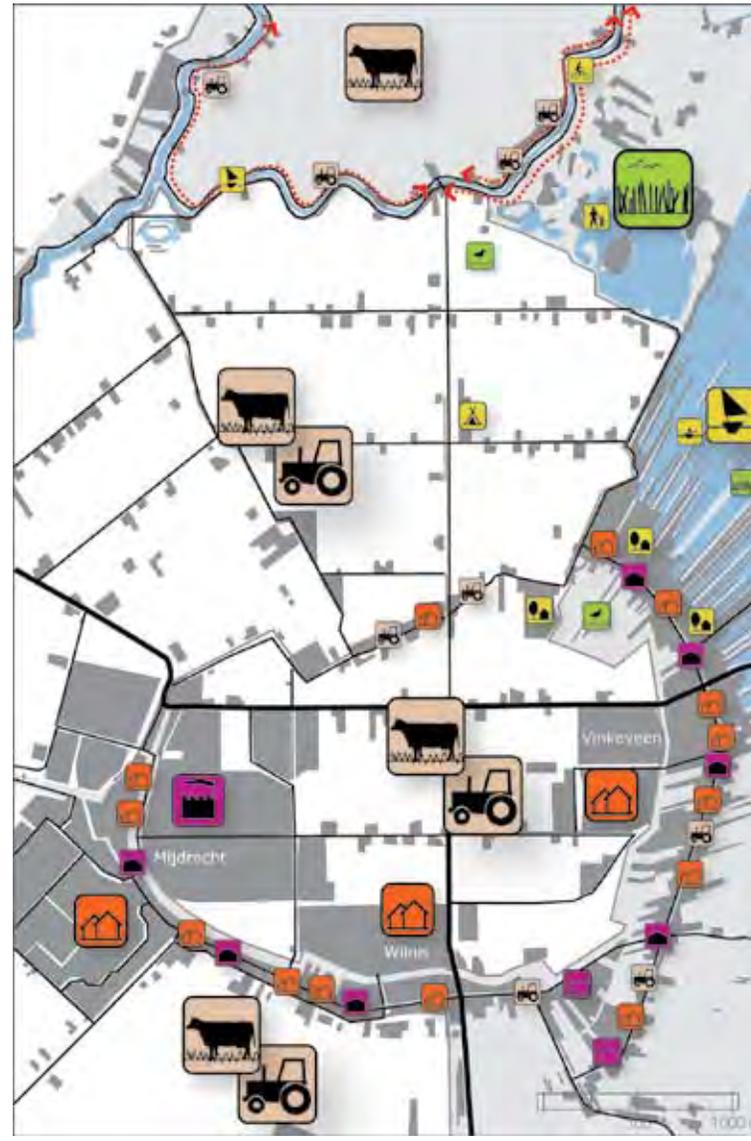
Road System





Mass

- mass
- river Amstel
- river Waver
- fortress
- open water (Botshol & Vinkeveense plassen)
- peat meadow
- reclaimed lake



Activities (indication)

- main road
- secondary road
- recreational track
- mass (in background)
- river Amstel
- river Waver
- fortress
- open water (Botshol & Vinkeveense plassen)
- peat meadow
- reclaimed lake

- natureconservation (meadow birds)
- natureconservation (marshbirds)
- walking
- cycling
- canoe
- boating
- holiday park
- camp site
- dwellings
- farmyard
- farmland
- greenhouses
- industries
- small businesses

The quality of nature and landscape

Groot-Mijdrecht consist of one uniform area. This area is subdivided in straight blocks by a network of watercourses, roads and lanes of trees. The character of the blocks is very monotony.

The cultural value of the landscape is related to the rational pattern, perceived by the network of roads. The experience of this network is dependent on planting along the roads and the farmsteads on fixed distances from each other.

The ecological value of the area is related to the use of the blocks. The nature reserve Waverhoek is an example of ecological nature, designed within the rational network of the landscape. This large scale nature accommodates many water birds and has similarities with the wetlands of the Oostvaardersplassen in the province of Flevoland.

The recreational use of the area happens in-between the network and the blocks. The network is the base of routes, while specific recreational activities happen in the blocks like the possibility to walk through a limited part of the Waverhoek or future recreational nature in the southern part of the polder.

The development of ecological networks

There are different plans for the area. In the northern half of the polder, the province together with other parties initiated to destine the eastern part for nature and water retention. Although farmers and local people do not see the need to change the function of these parts of the polder, most of them acknowledge the need to

do something. In the southern part, the open area between the different towns will be transformed to a landscape park. This park will consist of a combination of recreational and nature areas with secondary use for water retention and extensive agriculture. Besides, almost 1000 houses will be built to finance this transformation.

The area is crossed by the EHS. The robust wetland corridor, which is planned between Lake IJ and the Biesbosch, is situated south of the polder, but another corridor crosses the polder through the planned transformation areas to connect the Botshol.



Nature development Waverhoek, access is limited



Farmers protest against inundation of the polder for water storage



Planted roads and main canals structure the landscape



Quality of nature from a landscape perspective

-  *diversely planted yards in occupation strip (high dynamic, intensively used)*
-  *open peat meadow (low dynamic, extensively used)*
-  *marshlands (Botshol & Waverhoek)*
-  *shrubs on backside side*



-  *main water course*
-  *main recreational track*
-  *main infrastructure (highway / railway / primary roads)*
-  *EHS demarcation (with indication of key areas)*
-  *towns*

Reflection

The problems with the seepage water are tremendous; not only from the perspective of agriculture, but mainly considering water management, flooding risks, dry out of surrounding areas, water quality and financial reasons. Further lowering of the water level in the polders is no solution anymore since nowadays water starts bubbling through the ground.

Inundation is a rather drastic solution, creating space for water recreation. More interesting for nature development and current use is a slow transformation of the landscape is a wetland with residential mounds. Agriculture is possible if different strategies are developed. By this development, the land and the landscape are not sacrificed, but adapted to existing abiotic circumstances.

Reaching ecological purposes by transforming large areas to nature reserves is a radical solution as well. Besides, the result is only profitable in one way: considering biodiversity goals. The large scale of the landscape of Groot-Mijdrecht asks for large gestures. Large wetlands can be created, or long straight corridors can be developed. The biodiversity of the area can be improved without erasing the references to former use. In this way, we continue to construct a landscape instead of deconstructing it.

Solutions

The landscape of the reclaimed lake is very different from the peat lands and natural levees elsewhere in the area. Therefore, very different solutions are needed. Besides, water problems can not be ignored. If inundation is the only solution, this means a total transformation of the

landscape. In that case, our cultural landscape perspective has a limited contribution. It seems that inundation is unavoidable on the long term, while a slow inundation has far consequences for the current landscape as well. Every design solution for the current landscape is therefore of limited value.

There is only one certainty: the northern part of the polder can be transformed to a nature core area. Because the area connects directly to the nature reserves of Botshol and Vinkeveense plassen, an agglomeration of nature can be developed. Alternatively, the edge of the polder along the Botshol and Vinkeveense plassen can be developed as a nature corridor. A third solution uses the existing structure of the polder landscape as a framework for nature development; by using the lines or by filling up the areas in-between. This third solution is therefore especially valuable for the southern part of the polder which is appointed as a multifunctional area with nature, water retention and recreation. For the southern part a robust mosaic is therefore imaginable, rather than a nature core area.



The agricultural image



The 'new nature' image



Agricultural use in a very open landscape



A new wilderness area with remnants of former structures (Naardermeer)

6.5 Comparison of cases

The success of Krimpenerwaard

The interaction between the ecological values, the cultural scene and recreational functions of nature turned out to be successful in the area of Krimpenerwaard. There are three different reasons for this successful interaction. Firstly, ecological key areas are located in the zone which has a low intensity of land use. Besides, this is the ideal location for nature development concerning the physical condition. The location is therefore appropriate both from a social and physical perspective.

Secondly, local people and tourists have access to the rural countryside which has many natural values like the historical *boezemlanden*. Also, these *boezemlanden* are sometimes accessible. Moreover, an elaborate recreational network opens up the countryside and connects to different accessible spots of the ecological key areas. The rural countryside and the ecological key areas are perceived as one entity from the recreational paths.

Thirdly, nature development in the Krimpenerwaard links up to the landscape. On one hand, the location of ecological key areas links to the physical conditions of the areas. On the other hand, existing (historical) lines and landscape elements have been used as leads for the recreational network and the design of nature.

The deficiencies of Oude Rijn and Bovenlanden

Plans for nature development in the cases of Oude Rijn and Bovenlanden do not have the same possibility for such a successful interaction as it exists in the area of Krimpenerwaard. The nature corridor is planned per-

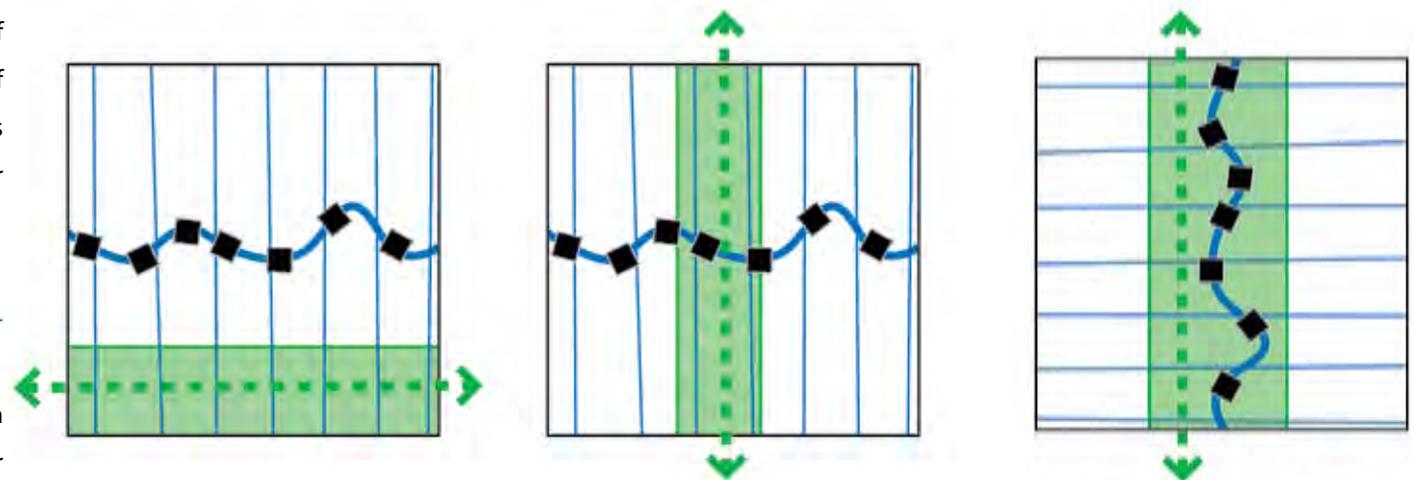
pendicular to the occupied strip along the river in the area of Oude Rijn. Except for the fortress of Wierickerschans, this avoids many interactions between different roles of nature. The crossing of the cultivation is seen as unavoidable instead of as a chance.

The whole Bovenlanden area, except of the cultivation base, is appointed as ecological corridor. The current use, which is very divers, is difficult in combination with this ecological ambition. The development and the current use of the area probably will be limited, while the possible combination with the recreational function of the area as backyard of Amsterdam and the attractive landscape has not been exploited.

Groot-Mijdrecht

The landscape of Groot-Mijdrecht is very different from the cases in the peat meadow landscape. Differ-

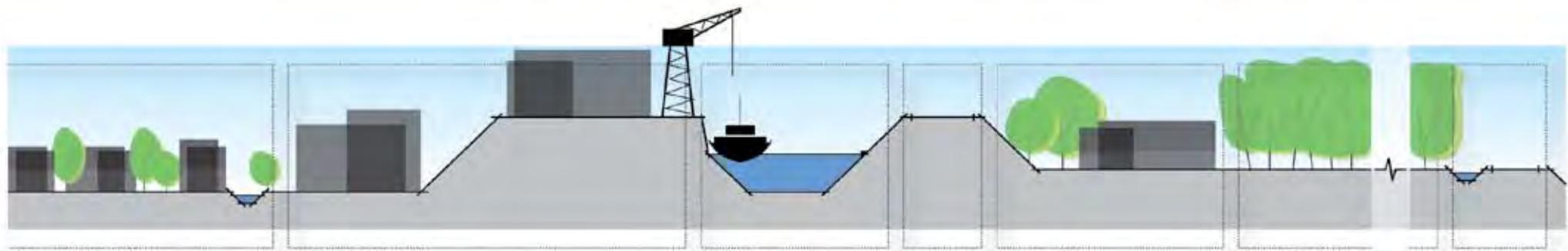
ent issues come up studying Groot-Mijdrecht. Not the historical cultivation bases and parcelling characterize the landscape, but the rational arrangement and large scale polder units determine the experience and possibilities. Specific for the case of Mijdrecht are its water problems. This asks for special solutions. But there are also general conclusions about the landscapes of reclaimed lakes. The ecological quality in reclaimed lakes is very dependent on the use of polder units. Intensively used agricultural areas have a low ecological quality, while wetlands like the Oostvaardersplassen and Waverhoek have much ecological potential. The quality of the cultural landscape is in the grid of the polders, not in the parcelling. Finally, recreational opportunities of nature in the reclaimed lakes are in both the grid and the polder units. Wild wetlands and recreation areas have obviously more possibilities for recre-



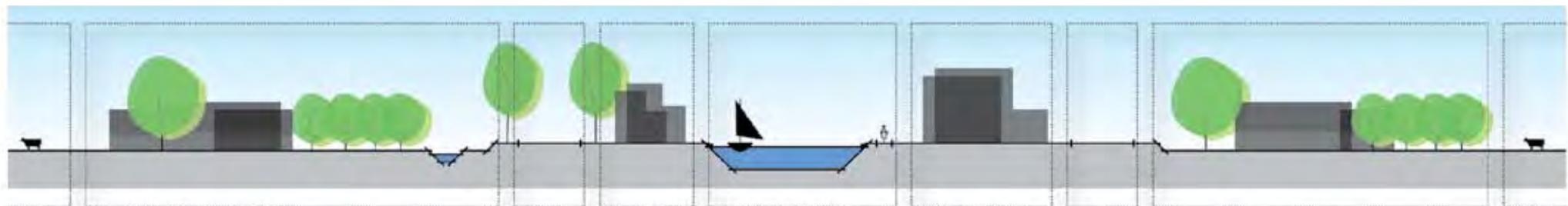
Case Krimpenerwaard; a corridor parallel to the occupation strip

Case Oude Rijn; a corridor perpendicular to the occupation base

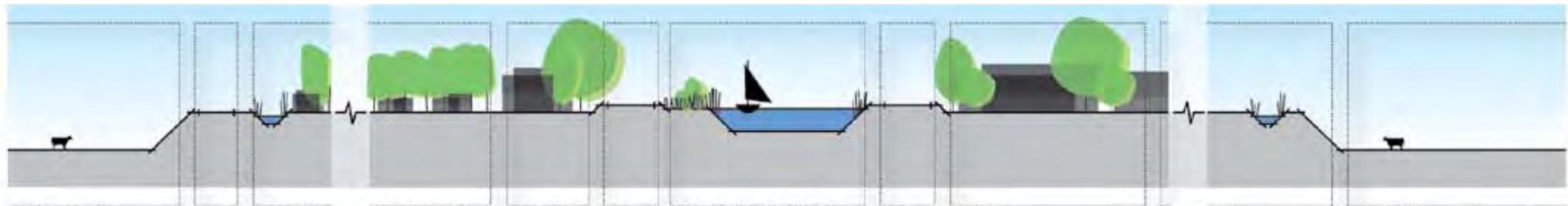
Case Bovenlanden; a corridor projected on top of the occupation strip



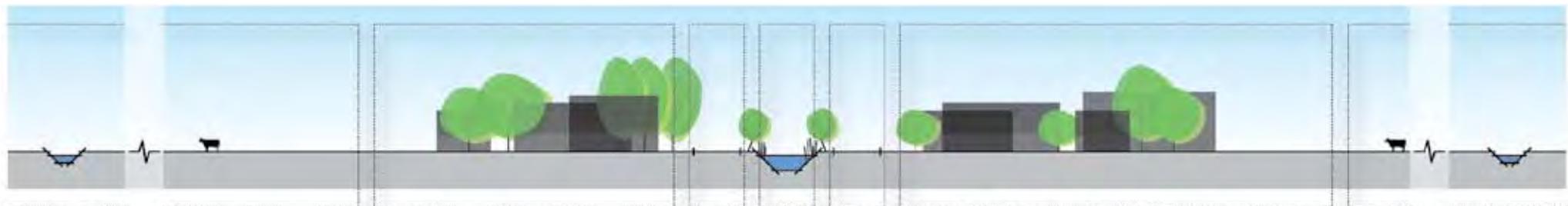
city of Gouda industries along river dike **river Hollandsche IJssel** road farmyard 'boezemland' meadow



meadow farmyard with orchard road riverside dwellings **river Oude Rijn** with facing and 'jaagpad' old factories and businesses road farmyard with orchard meadow



reclaimed lake (meadow) road holiday park up to backside dike riverside dwellings road **river Kromme Mijdrecht** with reed shores road farmyard meadow with backside dike reclaimed lake (meadow)



meadow with backside dike farmyard road **water-course** road farmyard / small scale business meadow with backside dike

Different dimensions and land use of occupation strips





ation than agricultural plains. These conclusions exemplify that a holistic approach to nature asks for a very different design in different landscapes. Sometimes we need large entities, sometimes small entities, sometimes separation, sometimes integration. Elaborate study is necessary to develop an appropriate approach for each landscape.

The direction of the ecological corridor

The success of Krimpenerwaard and the deficiencies of other cases in the peat meadow landscape are related to the direction of the ecological corridor when it approaches the spatial dynamics of the cultivation bases. The direction of the ecological corridor in the area of Krimpenerwaard is parallel to the occupation base, while the direction is perpendicular to the residential area of Oude Rijn and the ecological corridor of the Bovenlanden coincides with the cultivation base.

Moreover, nature development and other activities are combined and realized in coherence. The arrangement of the nature corridors in the other cases doesn't offer many leads for integrated development. In the end, the ecological corridors do not anticipate on the different circumstances concerning the appearance of nature.

Dimensions and land use of cultivation strips

Next to the direction of the ecological corridor, on a lower scale level the dimensions and land use of the cultivation strips are important as well. On the previous

page, three cross sections show examples of specific dimensions of cultivation strips along river Hollandsche IJssel (case Krimpenerwaard), river Oude Rijn (case Oude Rijn), river Kromme Mijdrecht (case Bovenlanden). A fourth cross section shows a cultivation strip along a watercourse.

Every single cultivation strip offers different possibilities for the use of the ecological matrix, the recreational use of nature and the exploitation of historical landscape elements. This not only has consequences for the allocation and design of new nature areas, but also for spatial concepts and nature policies in general. It asks for a contextual approach in which local characteristics are leading.



River Hollandsche IJssel



River Oude Rijn



River Kromme Mijdrecht



Watercourse in occupation strip





Design approach 7

a local patchwork

Introduction

In the previous chapter, we explored interactions between ecological, recreational and historical nature in practice. In this chapter, conclusions from the cases are seen in relation to a holistic approach of nature and resulted in a design approach for (new) nature. The first paragraph concludes on the landscape of the peat meadow landscape and characterizes it as a peat meadow mosaic. The second paragraph tells how we can learn from nature development in case Krimpenerwaard and how characteristics of the peat meadow mosaic can be used for a new approach to develop new nature areas. We called this approach the 'local patchwork'.



The meadow; on the horizon the occupation strip of Den Hoef (Bovenlanden)



The occupation strip (Donkereind, near Vinkeveen)

Landscape: a peat meadow mosaic

The local cases show that there is no one way approach to develop nature areas in the Green Heart region. There appears to be a great difference between on the one hand reclaimed lakes, and on the other hand a system of rivers and peat meadows. We focus on the development of a design approach for the latter, which from now on we call the peat meadow mosaic.

Water as a guiding principle

The water system of main importance. A review of the structure of Dutch spatial planning shows that there can be distinguished three stages, based on the balance of power in today's policy and practice. (Feddes et al., 1998, Sijmons, 2002) The stages propose a priority given to different land uses. The first priority or stage is our (future) water management, according to Sijmons this forms the main condition for the existence of our land. The second stage is formed by infrastructure planning, on land as well as on water. The third and final stage comprises the allocation of land use like for example housing, business districts and agriculture. The importance of the water system is also recognized by the Stuurgroep Groene Hart (Witsen, 2006), who state that durable solutions concerning water problems should be based on the following principles. 1) More space for water storage, 2) a decrease of the amount of different water levels, 3) a decrease of the supply of water from outside the area, and 4) a limited the influence of brackish seepage. Besides that, the principle that the water level is based on the land use should be reversed in some areas. In those cases, 'function follows water level' should be the new adage.

In search for a new design approach, we should consider the patchy and clearly bordered character of the peat meadows. Borderlines between polders and especially borders between peat cultivations and peat reclamations are clear characteristics of the peat meadow landscape, even though sometimes these lines are not directly visible in the landscape. Keeping those borders intact is a condition for sustainable future water management, especially in relation to the preservation of culturally valuable landscapes. Nearly every border is set by a backside dike and many times views to both sides are wide.

Polders units set the dimensions of the landscape

Polder units and their leading structures set the dimensions of the landscape. The dimensions of a polder greatly differ. Peat reclamations for example are characterized by wide, rational parcelling and spread farmsteads, while peat cultivations are distinguished by linear structures along peat streams. Dimensions are set by both the grain size and the dispersal of patterns.

Within the polders and the hydrological regime, land use functions find their place. Originally, functions focus on the agricultural use. These functions go together with typical spatial patterns and structures. The recent diversification of land use functions often does not seem to correspond with these typical patterns and structures, resulting in a loss of distinctive characteristics.

Considering the allocation of land use functions within the hydrological regime and the polder units, leading structures should be distinguished and should form the starting point for the allocation of land uses.

Sustainable organizing structures

The peat meadow landscape is characterized by open areas which are cut through by residential strips on cultivation bases. Therefore these cultivation bases along the water courses determine the spatial structure of the landscape. The organization of the landscape is related to these bases. Parcelling is an exponent of this structure as well. The (historical) legibility of the landscape therefore highly depends on the composition of cultivation bases and parcelling.

The parcelling of the peat lands is very sustainable; most cultivations exist already for many centuries. Contrarily to other landscapes, the parcelling is not changed by land consolidation projects. The explanation for this sustainable parcelling is in the hydrological system, which is leading in the land use and design of the area.

Close relationship between buildings and parcels

There is a close relationship between buildings of cultivation bases and the function of the parcels on the backside. If the parcels get another purpose, the use of the buildings changes as well and often the other way around too. This counts especially for agricultural use. Strip developments along cultivation bases originally consisted of farms. Because of the scaling up of agriculture, many farmsteads nowadays have a different function, which might be commercial or residential. For a long time, remaining farmland was occupied by other farmers. Due to nature development on farmland however, characteristics of the strip development continues to change. Consequences of this change in activities are substantial.

The natural value of farmyards and private backyard is widely differs. But also the networks get a different function, are not useful anymore, or new networks have to be added. Moreover, aesthetics of the landscape change obviously.

Networks:

the capillary system of the landscape

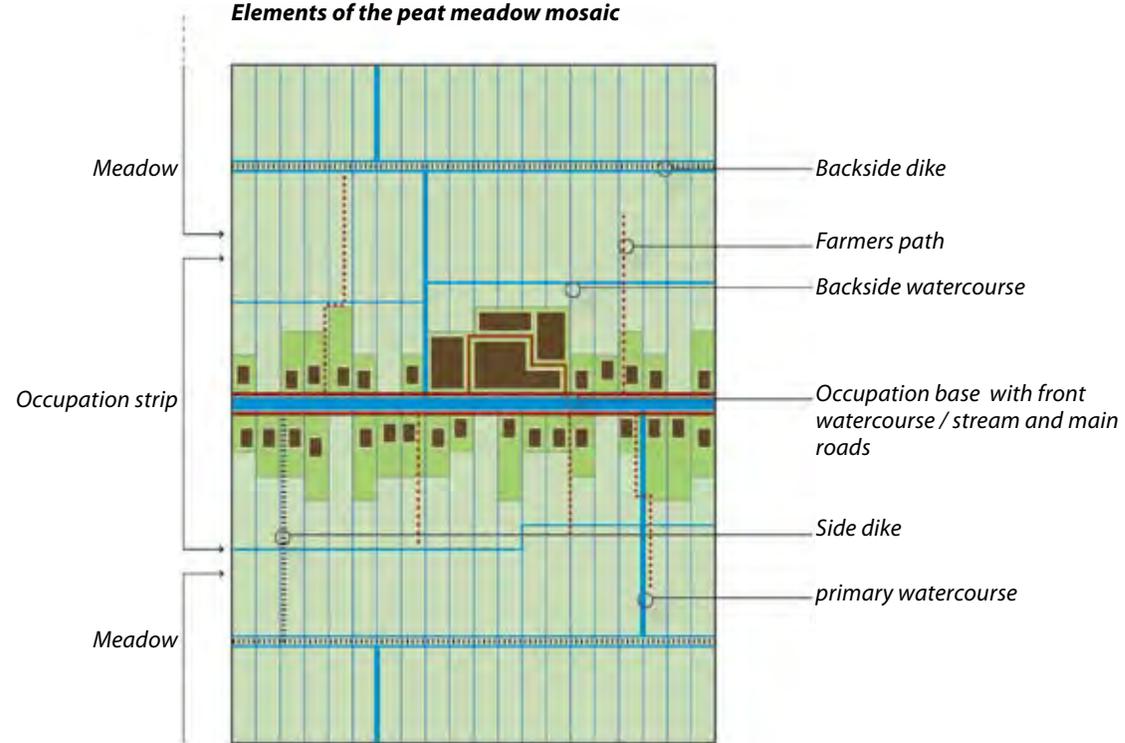
The peat meadow landscape is regulated by networks. There are two kinds of networks in the area: the water network and the network of roads. These networks regulate the activities in the area. The water network is the support of the physical spatial structure, while the road network is the most important condition for regulating activities.

The intensity of networks determines the possibilities for use, but on the other hand land use asks for an appropriate network. Silent areas in the Randstad metropolis are not empty because they are peripheral, but have no structure which attracts urban activities. Wetlands have only potential if there is an extensive water network.

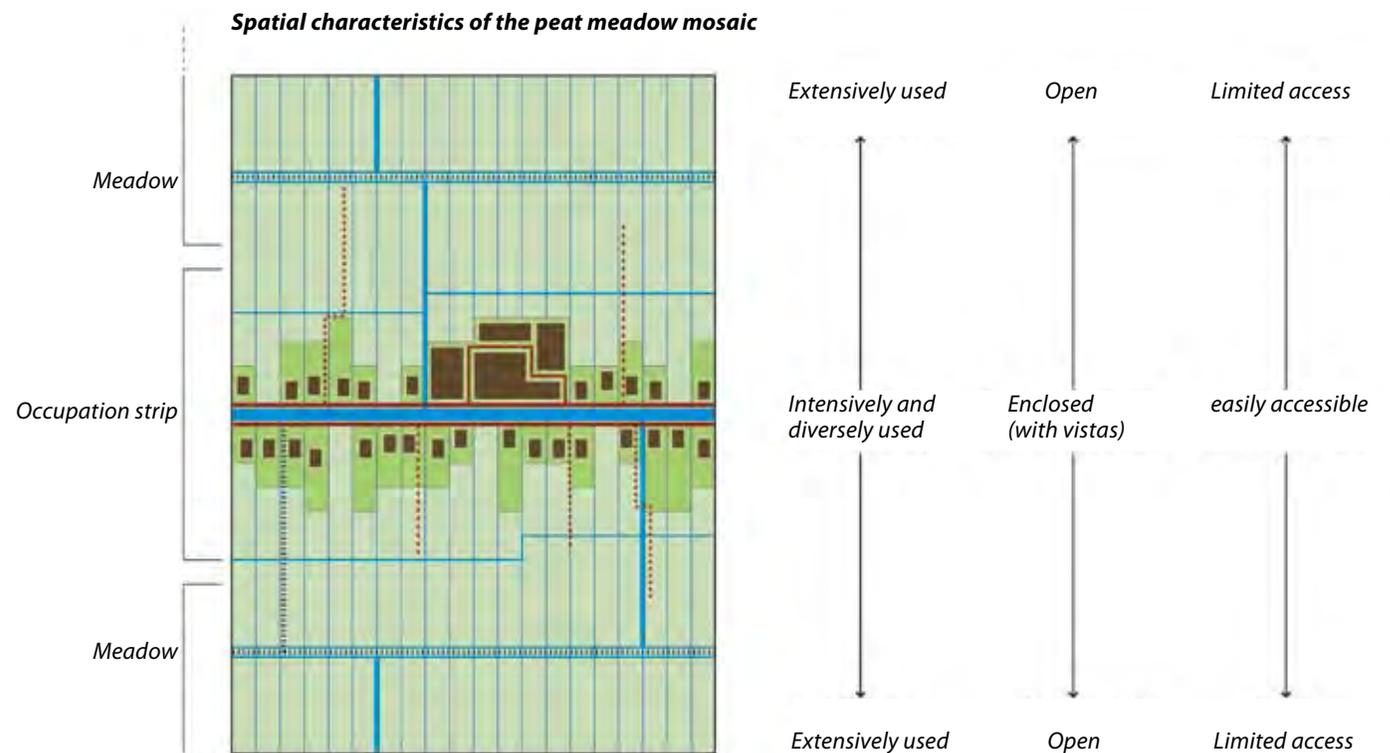
Not only the intensity of networks, but also the priority of networks is an important condition. There is a big difference in use between rivers and ditches, or unpaved roads and highways.

These considerations seem obvious, but are the basic conditions of landscape planning and design. Moreover, it determines the ecological value, the historical experience and recreational use of nature. A dense road network threatens the ecological quality of nature, while some paths are necessary for recreational use of nature. Finally, the cultural meaning of nature and landscape is often related to both the water network and the road network.

Elements of the peat meadow mosaic

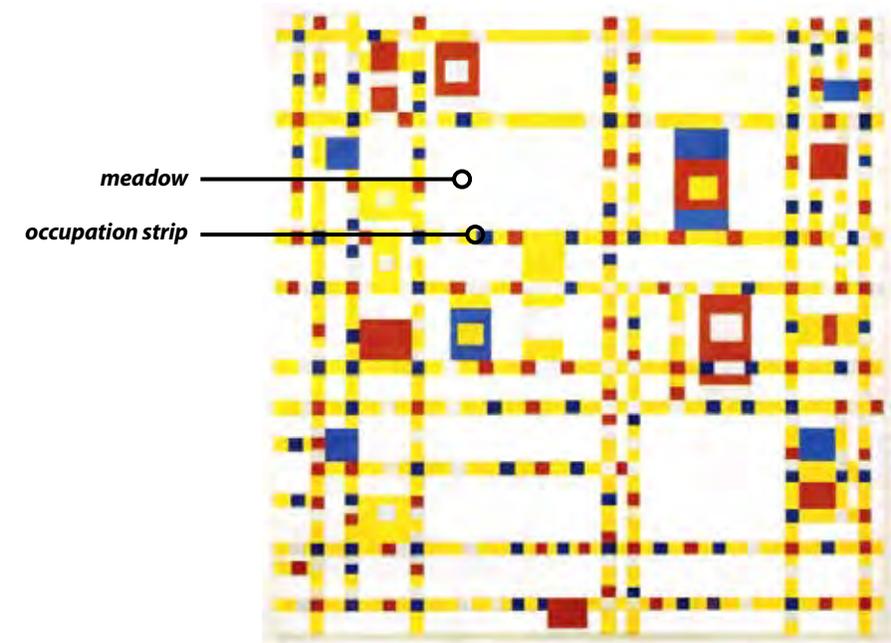


Spatial characteristics of the peat meadow mosaic

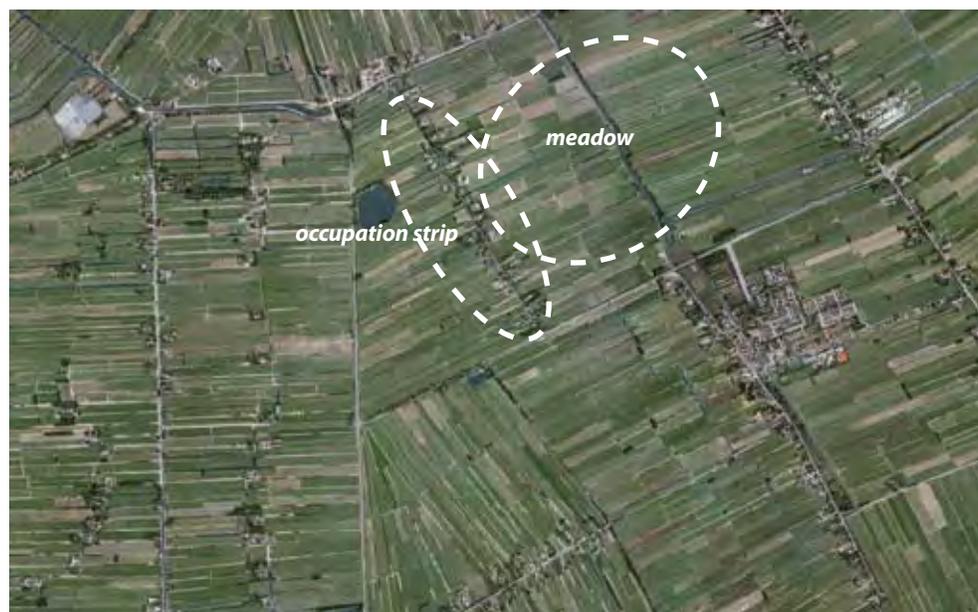


A peat meadow mosaic

The peat meadow landscape is characterized by an alternation of large openness and occupation strips along cultivation bases. This visual pattern is supported and anchored in both a water network and a road network. The water network is leading in the area and determines the design of polders and the parcelling pattern. The location of cultivation strips is based on the water management system as well. The land use is very dependent on the road network and directs people's activities.



Broadway Boogie Woogie (1942-43) from Piet Mondriaan can be a metaphor for the peat meadow mosaic.



The peat meadow mosaic near Kockengen



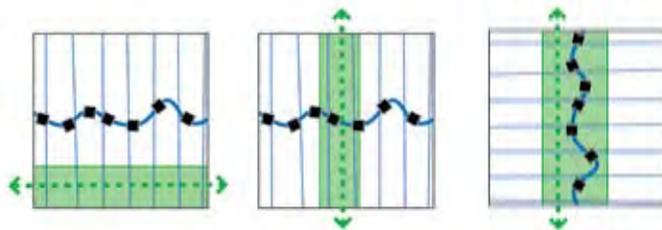
The peat meadow mosaic near Haastrecht, south of the river Hollandsche IJssel

7.2 A new arrangement of the wetland corridor

Learning from Krimpenerwaard

The interaction between the ecological values, the cultural scene and the recreational use of nature in the cases of Oude Rijn en Bovenlanden can be strengthened by learning from the area of Krimpenerwaard.

Not the position of an area in the ecological network, but the landscape and spatial dynamics are the fundamentals for nature design which exploits the interaction between different values and use of nature. The ideal locations for ecological key areas are outside dynamic zones. At the section where the wetland corridor and spatial dynamics of cultivation bases cross, a various countryside with nature values has more social benefits than a tight ecological corridor. Here, the interaction with other activities in nature design is essential.



Not the position of an area in ecological networks, but the landscape and spatial dynamics are fundamentals for nature design

Intensity of land use

Conclusions from local cases relate the intensity of land use and the desired alternation of ecological key areas and multifunctional areas. These conclusions show some similarities with the casco model. The casco model proposes a separation of low and high dynamic land use in low and high dynamic areas.

In the casco, high and low dynamics are related to time

(the time necessary for a certain land use to develop). In contrast, we think it is also valuable to relate high and low dynamics to the intensity of land use and the interactions between land uses.

We notice both high and low dynamic areas in the peat meadow mosaic. However, the division is not based on differences between nature and agriculture, but on differences between open peat meadows and enclosed cultivation bases. In our conception, the cultivation bases situated on river banks and along main watercourses, make the high dynamic framework. Low dynamic areas are the agricultural areas in-between cultivation bases. This is in contrast with the casco model, which discerns a low dynamic framework and high dynamic in-between spaces.

The theoretical study of chapter four already showed problems with the application of the casco model in the man-made landscapes of the low Netherlands. This is exemplified by considerations from local cases. Besides, we considered the separation strategy not the right solution for present landscape issues.

But there is another problem: the casco model does not have the possibility to develop low dynamic land use (nature) in high dynamic areas (cultivation base). Although consequences of this approach appear legitimate, they do not offer any solution for the ecological objective of the wetland corridor. The corridor crosses high dynamic cultivation bases, but according to the casco model, only low dynamic areas are useful for nature development. This strict interpretation of the landscape casco frustrates the realization of social objectives contrarily to landscape dynamics. It grounds in the assumption that landscape architecture is the decisive consideration in making social

objectives. This assumption is rather utopian, if not undesirable.

Key areas and local patchworks

Notwithstanding troubles with the casco model, different intensities of land use ask for different design strategies. Every direction in which the ecological corridor approaches a cultivation base asks for a specific landscape design. If the residential strips of the cultivation base are parallel to the direction of the corridor, a cross-section can be made between them by recreational strips of nature, like in the case of Krimpenerwaard happened with by the use of 'boezemlanden'. If the corridor is combined with the residential strip in the same direction, the corridor needs a multifunctional lay-out to combine different use of the area, like in the case of the Bovenlanden. If the direction of the corridor crosses the direction of the residential strips, like in case Oude Rijn, the landscape should be permeable on the cross-section.

Based on a matrix strategy, an ecological connection through the cultivation base can be realized. Besides, the network of historical lines and water courses offer many opportunities for the development of ecological, historical and recreational nature.

For the peat area mosaic, we propose a local patchwork combined with ecological key areas. The patchwork is characterized by shapes of different size and lines with a different use but most of them have some or more ecological, recreational and cultural value. Ecological key areas are concentrated in the open areas with subsidizing soils. Sections of the Wetland Corridor that cross cultivation bases are transformed to permeable multifunctional

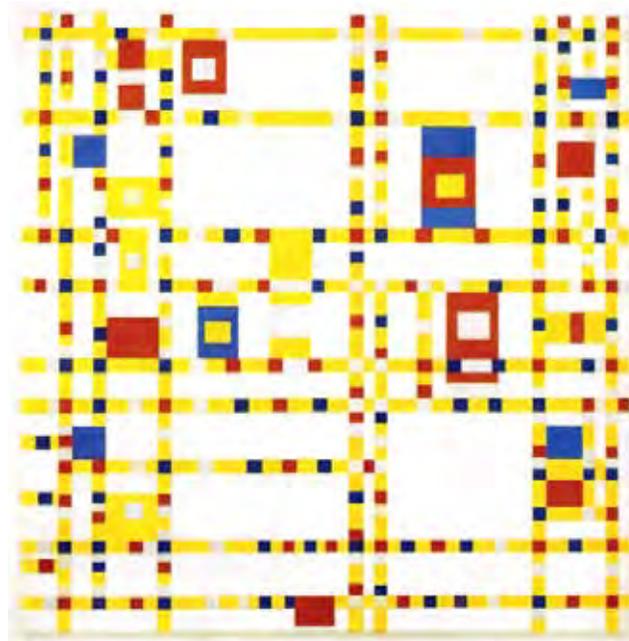
landscapes. The existing landscape offers many frameworks of line structures which might be the base patchwork design. Moreover, these networks often crosses different landscape entities like cultivation bases and open meadows, offering possibilities to create an ongoing network of natural areas.

Networks

The realization of the natural patchwork is highly dependent on the design of networks. The intensity and priority of networks create the possibility to conserve vulnerable values of nature and to facilitate recreational values of nature. Moreover, network design offers possibilities to create an 'organic' spatial organization in which the allocation of different land uses strengthen each other. (These planning principles will be further developed in chapter eight.)

Concerning the recreative use of nature, networks have a key function because this use is often related to the accessibility of nature. Accessibility has to do with different issues. Firstly, it is about the physical accessibility of existing nature areas. Secondly, there should be nature to make access possible. Concerning the second issue, the present nature development is mostly planned in far from peoples' home areas.

Partly, this two track approach is a solution for the absence of nature close to people's homes. However, physical accessibility still forms the main problem. This is not only about nature reserves that are open for people, but also about the accessibility of the countryside in general. Nature can provide in an increased accessibility of the countryside. Therefore, recreational networks have priority.



1 .

1. The landscape as a peat meadow mosaic

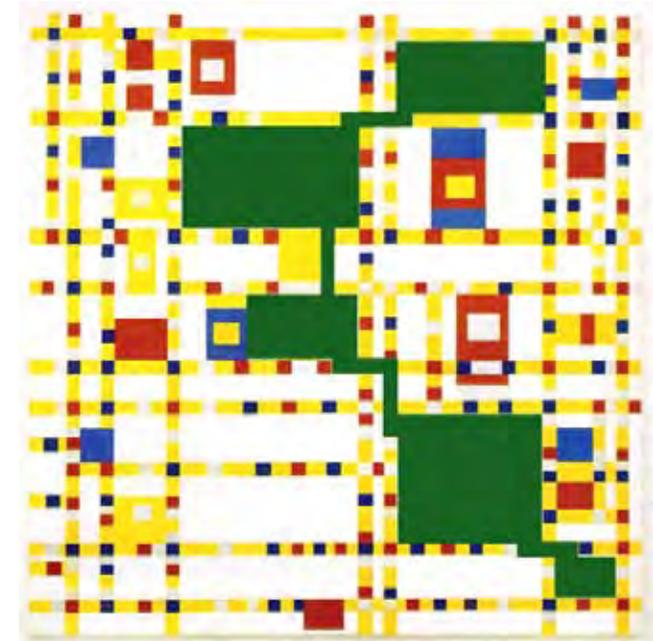
A straight and linear built landscape with large, open meadows (white patches), and smaller, more enclosed occupation strips (colourful little patches).

2. The ecological network as it is approached nowadays

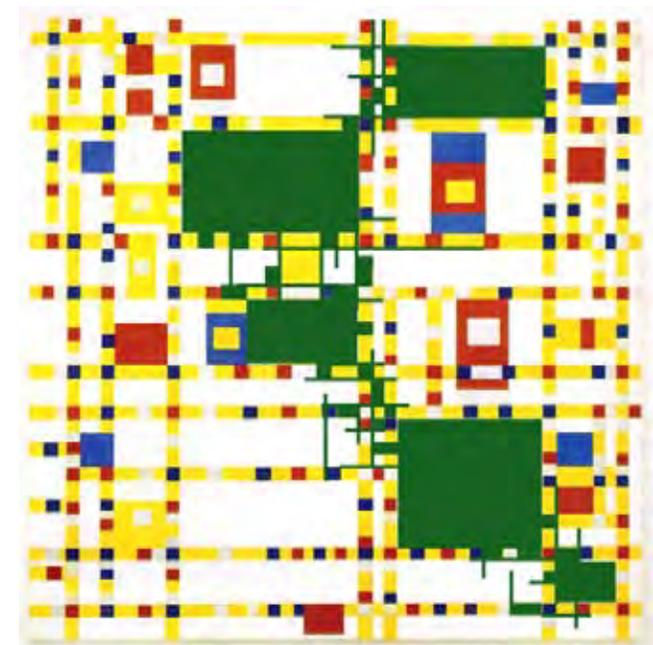
New key areas in large open meadows, rigid corridors through occupation strips.

3. A local patchwork instead of corridors

In the occupation strips land use and pattern are very much intertwined. A 'local patchwork' instead of corridors at the occupation strips is more valuable.



2 .



3 .

7.3 A local patchwork

Previous paragraphs learn that

1. *The landscape of the Wetland Corridor can be characterized as a peat meadow mosaic supported and anchored by a water and a road network.*

2. *The success of nature policies can be increased by an alternation of ecological key areas in extensively used areas and local patchworks in the surroundings of cultivation bases.*

This paragraph describes some characteristics of the local patchwork in relation to the Wetland corridor. The patchwork is a new tool for the realization of ecological networks. Application is especially useful in intensively used areas of the peat meadow mosaic. The patchwork strengthens the recreational and cultural historical value of the landscape, without losing ecological connectivity. Building blocks for the patchwork are essential elements of the peat meadow mosaic: the road network (to regulate accessibility to nature) and the water network (to reach ecological connectivity).

A new concept for the peat meadow mosaic

Ecological permeability

We propose a multifunctional design and planning of the Wetland Corridor. To reach this multifunctional application, we add the local patchwork to the traditional triplet of key areas, nature development areas and (robust) corridors. Besides, we add the permeable matrix to existing connection strategies. Therefore, the connection be-

tween different key areas does not only exist of nature areas, corridors and 'stepping stones', but builds on the ecological value of agricultural land use, recreational areas, cultural historical objects and ultimately residential areas.

Our triplet consists of 'ecological key areas' (in which traditional key areas and nature development areas are integrated), 'local patchwork' and - if unavoidable - 'corridors' when crossing major infrastructure.

Key areas and patchworks

Areas with an extensive land use are especially useful for large nature reserves in which large populations are able to develop. These areas intend to develop as key areas accommodating viable populations. The function of nature in the intensively used areas is not primarily ecological. In these areas a patchwork pattern is more useful. Patchworks have the advantages of a spread disturbance risk for species, and utilize the natural values of different land uses. Moreover, patchworks are multifunctional. The function of patchworks depends on land use characteristics, while the design is inspired by the local landscape. Some high dynamic areas need corridors for a vital ecological connection between nature areas, especially those areas where nature is cut through by highways, canals or very dense residential strips.

The principle of integration

On site level, the patchwork is characterized by integration of land use. Nature is not restricted to 'appointed' nature areas and can be related to other land uses. For

example, planting on farmyards can contribute to the development of the patchwork. Also restoration and conservation of landscape elements might contribute to the development of nature. And last but not least, edge theory from landscape ecology is valid as well for landscape quality and social merits: gradients make the landscape interesting.

Strengthening of the peat meadow mosaic

Grain size

The local patchwork builds on fine grain sizes in the cultivation bases. This emphasizes the alternation of enclosed cultivation bases and open peat meadows in the peat meadow mosaic. Fine grained sizes are strengthened by spontaneous nature experiences on a small scale and the development of recreational nature in the cultivation bases.

Accentuation

The local patchwork strengthens the peat meadow mosaic by accentuating line patterns in the landscape, like main watercourses and (planted) dikes on the backsides of cultivations. These accentuations increase the legibility of the cultural landscape, while they can form starting points for ecological and recreational networks. Many times, a combination between ecological and recreational corridors is attractive, although a precise design should determine the success of especially the ecological function.

Spatial organization

The local patchwork offers an important contribution to a sustainable spatial organization of the peat meadow mosaic. We consider the water network and the road network as main building blocks. They are basic structures for respectively ecological and recreational use. Ecology has priority when the water network is dominant, while recreational use of nature has priority when the road network is intensive. The water network is an important tool to realize ecological connectivity in intensively used areas.

This spatial organization doesn't only count for the local level and for ecological and recreational use of nature. The two networks appear on the regional level as well, regulating the intensive and extensive use of the area. Here we see parallels with Tjallingii's strategy of two networks (Tjallingii, 2000, Woestenburg et al., 2003). This strategy starts from the road and water network as well, situating different land use in between these networks.

Sustainability of the spatial organization depends on the design of the two networks. The intensity and priority of networks is essential. A combination of those determines possibilities for intensively and extensively used areas, between high dynamic and low dynamic and between urban and rural. Landscape design is primarily about this regulation, more than about the aesthetics of the future landscape because this will be highly influenced by particular users.

Social benefits of nature

The local patchwork is an important tool concerning the social benefits of nature. One of the principles of the concept

is that it not only supports ecological objectives, but also consumptive objectives like tourism and recreation. Spatially, the difference between recreation and tourism is that recreation is tied to accommodation, while tourism is focused on an object (De Pater, 1983 in Van der Knaap and Jaarsma, 2002). When we talk about recreation, we include certain forms of tourism. These forms of tourism contain especially those people attracted by the fortress Wierickerschans or the international allure of the Green Heart. Most people who spend their spare time in the area are recreants living in the region or people using the area for certain activities.

Landscape experience

Apart from the contribution of the patchwork to specific forms of recreation and tourism, it also enhances landscape experience. Landscape is experienced differently by different people. Originally, nature experience was determined by traditional nature views like a functional, Arcadian and wilderness view. Presently, new multiple nature views emerge like a technological, interactive or new functional view (Woestenburg et al., 2003). We try to give all these experiences an appropriate place in the peat meadow mosaic. While wilderness and historical identity are central concepts for nature in ecological key areas, the position of nature in the cultivation strips will be developed more functional and interactive. This new functionality is different from traditional agricultural functions. Allotment gardens and gathering of edible products characterize this new functionality. Interactive nature experience has more to do with appropriation, which is characterized by multi functionality and spontaneous, non-regulated developments. Allocation of

different roles of nature in the peat meadow mosaic is related to conservation strategies in ecological key areas and consumptive strategies in cultivation bases.

Recreational networks

Not only ecological connections are interrupted by infrastructure and building strips, also recreational tracks are cut through by infrastructure and urban areas. Especially major infrastructure restricts regional nature and landscape recreation. Recreational routing for cycling and walking connects cultivation bases with extensively used peat meadows. The local patchwork forms the operating base for recreants. The cultivation base accommodates facilities, while ecological corridors which cross major infrastructure have also potential for recreational routes.

Interactive places

A second category of recreation in the area is recreation tied to a particular area. Examples of this category are canoeing, camping and swimming. These activities have many development possibilities in the cultivation bases where spontaneous nature is leading. There is also space for unconventional kinds of recreation in the local patchwork, like recreation related to interactive nature views and new functionality of nature. The social benefits of nature is largest in the local patchwork because there is space for many private initiatives and nature for children to play. This strengthens the nature experience of children and therefore their engagement with nature conservation (Louv, 2007).





Design case

8

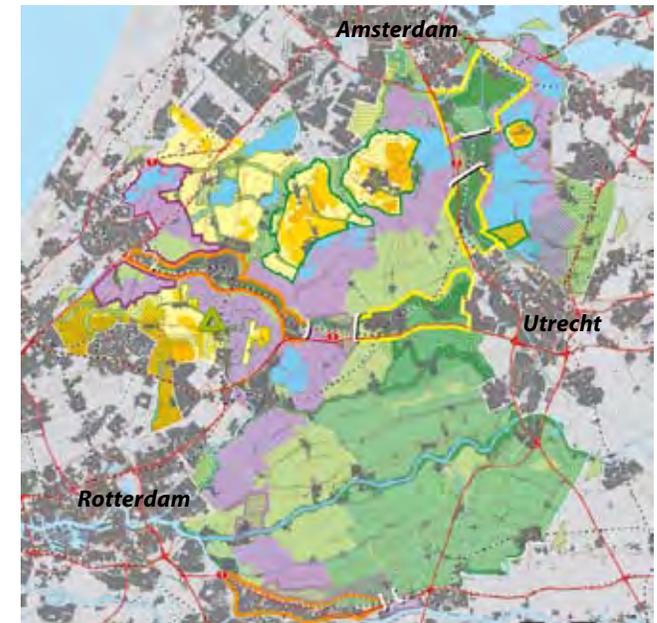
realization of the local patchwork

Introduction

This chapter discusses the design application of the local patchwork for the area of case Oude Rijn, between Woerden and Bodegraven.

Purpose is to illustrate the appearance of a local patchwork. Moreover, we will give measures for construction. The crux of this chapter is to show how it can work. In other words, it offers a possible solution.

We take different steps in preparation of the design. Firstly, we analyze policy ambitions for the area and describe what this means for the roles of nature. Secondly, we continue our analysis of the area between and formulate the design assignment. This brings us to the conceptual design. In the last part, we present the final design for the cultivation base along river Oude Rijn and give some considerations about measures necessary to reach the design.



Spatial quality of the Green Heart region

Source: Ontwikkelingsprogramma Groene Hart (2006)

-  low peat area with strong subsidence
-  high peat area with modest subsidence
-  peat area with thick clay layer and river clay area
-  reclaimed lake with brackish seepage
-  reclaimed lake with large (fresh) seepage
-  reclaimed lake with little (fresh) seepage
-  natural levee
-  transformation zone (west)
-  transformation zone (east)
-  window area
-  added section in the Wetland Corridor
-  urban green area
-  'peat parks'
-  reclaimed lakes with priority
-  greenport Boskoop
-  Recreational node

Design context

The design context for the area of Oude Rijn is largely based on ambitions of the Green Heart policy of the Dutch provinces of Noord-Holland, Utrecht and Zuid-Holland. The aim of this study is to link the different roles of nature to a specific place in the local patchwork and ecological key areas. Moreover, roles of nature will be associated with activities.

Policy ambition

We already discussed the Development Perspective for the Green Heart in previous chapters. This policy document is the joined strategy of three provinces for the implementation of the Green Heart National Landscape. The development perspective mentions ten priority projects for the Green Heart. One of them is the 'window area' between Woerden and Bodegraven. This project contains different purposes for the development of the area.

Window area

The countryside between Woerden and Bodegraven is appointed as a 'window area'. According to the provinc-

es, window areas are situated on spots where different landscape entities of the Green Heart come together and where they are crossed by infrastructure. The landscape should be experienced from the roads on these locations. Besides, the areas become the recreational entrance to the Green Heart. Concerning the entrance function of the area, recreational transfer points are planned. Window areas are the counterpart of urban transformation zones, which are characterized by urban development.

Town - countryside relationship

The occupied zone along the Oude Rijn between Woerden and Bodegraven is a continuation of the zones along the Oude Rijn east and west of the area. Because the area is appointed as Window area, contrarily to zones east and west of the area, the relationship between town and countryside should be developed differently. The focus is on a qualitative and robust green zone between the towns of Woerden and Bodegraven and the countryside of the peat meadow landscape.

Recreational node

The fortress of Wierickerschans is one of the pillars of a marketing project about the Green Heart. The strategic location of the fortress, one of the scarce remnants of the Old Dutch Waterline of Defences, is an appropriate location for a recreational node. According to the provinces, the fortress should become the entrance to the Green Heart. Different facilities and information will therefore be clustered in the fortress, which is property of the Dutch Forest Service.

Wetland Corridor

We already discussed the aim of the Wetland Corridor in the previous chapters. The Wetland Corridor should connect the Nieuwkoopse Plassen area with the Reeuwijkse Plassen area by a north-south connection which crosses the occupation strip of Oude Rijn and which crosses different railways and motorway A12. The Wetland Corridor does not cross this area by chance. The aims of the Window area, town-countryside purposes and recreational function of the area closely connect to the desired development of the Wetland Corridor.



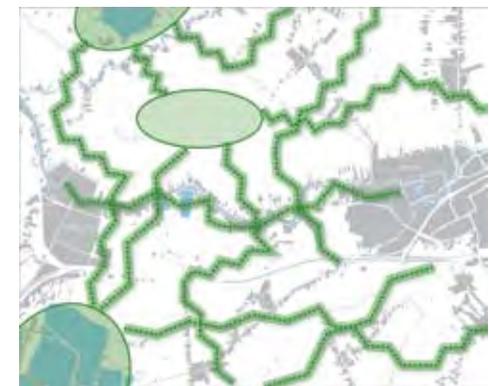
Window area: vistas from roads and fortress



Town - countryside relationship



Recreational node: fortress Wierickerschans



Wetland corridor: permeability

Exploration of landscape and networks

This paragraph discusses the landscape system and networks. Both were already introduced by the case study in chapter six. The landscape is arranged along the river Oude Rijn, characterised by a contrast between natural levee and peat meadows. Moreover, the spatial structure of the peat meadow mosaic turned out to be organized by networks. More specifically, water network and road network. Accessibility of the area is regulated by these networks, while activities are often attached to the network because networks grant necessary accessibility. This paragraph continues on the case study analysis, focussing on the network layer.

The landscape system

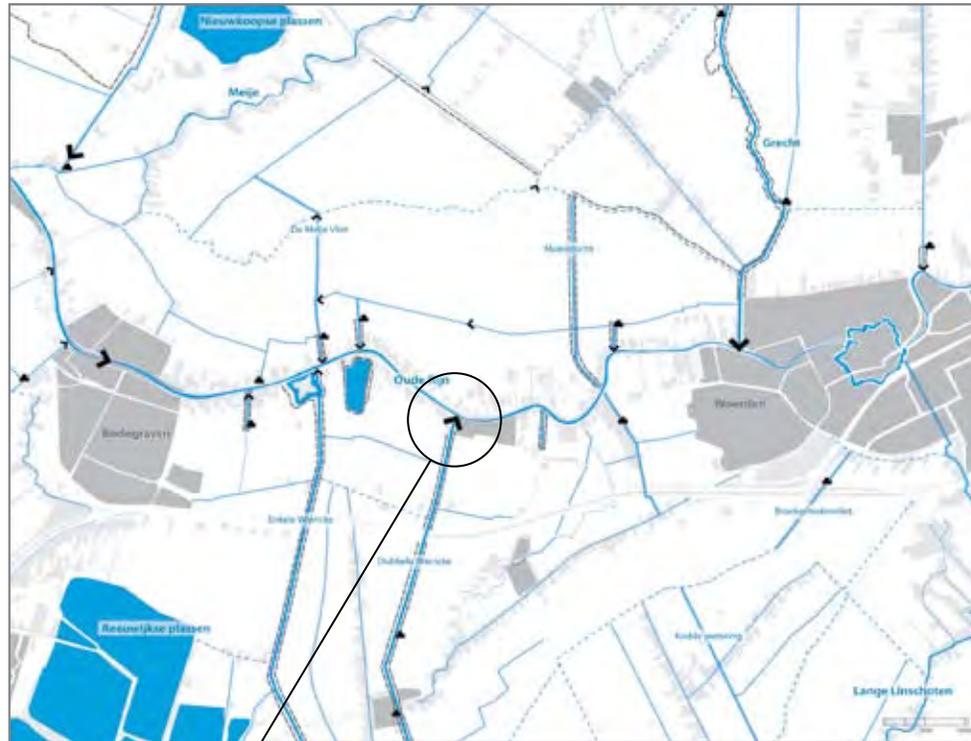
The landscape of Oude Rijn consists of two areas: natural levee and peat meadows. The size of the natural levee differs. Farms are built away from the river (and the road) when the sandy clay strip is wide. Long paths connects the farms to the road. Apart from the cultivation strips, the backside dikes of cultivations appear as lines in the landscape. The water management of the area is completely regulated to keep the area dry. The subsidence of soils is a major problem. Concerning subsidence, a further lowering of water levels is undesirable. Moreover, much water is drained during winter, while there is a water shortage in summer. Water from outside has to be let in to maintain the water level in dry periods, which is not preferable concerning water quality. Many polders are alternately a seepage or infiltration area. Without a fur-



Farmyards are built away from the river when the soil of the natural levee contains wide zones of sandy clay (near Nieuwerbrug)

The water system and network

-  lake area
-  river
-  main watercourse
-  secondary watercourse
-  backside dike
-  other watercourse
-  dike
-  lock
-  sluice
-  pumping installation
-  towns
-  mass (in background)



ther lowering of the polder's water level, the area will be wetter and not as suitable for agriculture anymore. This vulnerability of peat soils is also showed in the structure of the landscape. Apart from cultivation bases in the peat, the peat meadows remain to be open areas, while the natural levee is densely occupied. This structure of the landscape determines the difference between intensive and extensive use. The road follows this structure, supporting the land use.

The water system and network

The water system of the peat meadow mosaic is very dense. However, only a limited part is accessible by motorboats. The dense network is only accessible by canoe, while many sluices and pumping stations form obstacles in entering the area by canoe. Also waterways accessible by motorboats contain sluices. They do not limit access and probably will be considered to be part of the attraction, like the bridge of Nieuwerbrug.



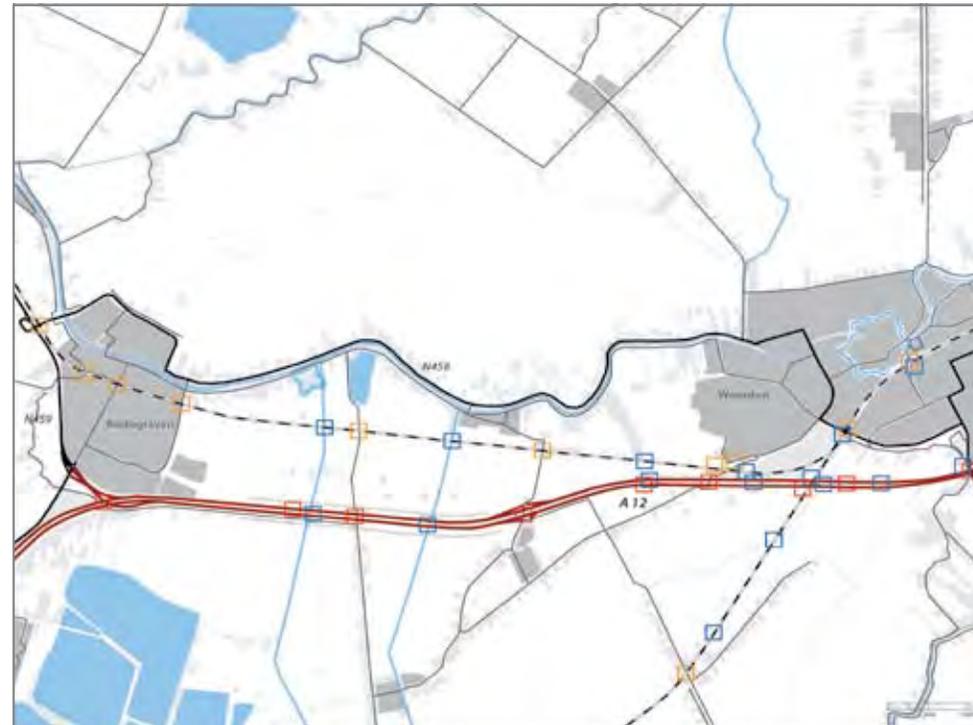
The 'dubbele Wiericke' is navigable (lift bridge at Nieuwerbrug)

Road network and farm paths

The road network is limited. Except of a single rural road, the area is only accessible by car through cultivation strips. The road north of the river Oude Rijn is a regional road, but is especially used by people travelling from Woerden to Bodegraven or people living in the area. The area is crossed by the highway A12, which keeps regional and local traffic from the local roads. Woerden and Bodegraven are connected to the railway system. As a consequence, the railway crosses the area as well. The limited road network guarantees a contrast between cultivation strips and open peat meadows.

Because of the very few roads, many farm paths appear in the area. Most of them are private dead end paths, not accessible and extensively used. Some farm paths along Oude Rijn connect farms with the major road, but most of them give access to peripheral parcels.

Farm paths offer a possibility to establish recreational networks. If only a few farmers in the area make their paths freely accessible for people, these can be the starting point for routes through peat meadows.



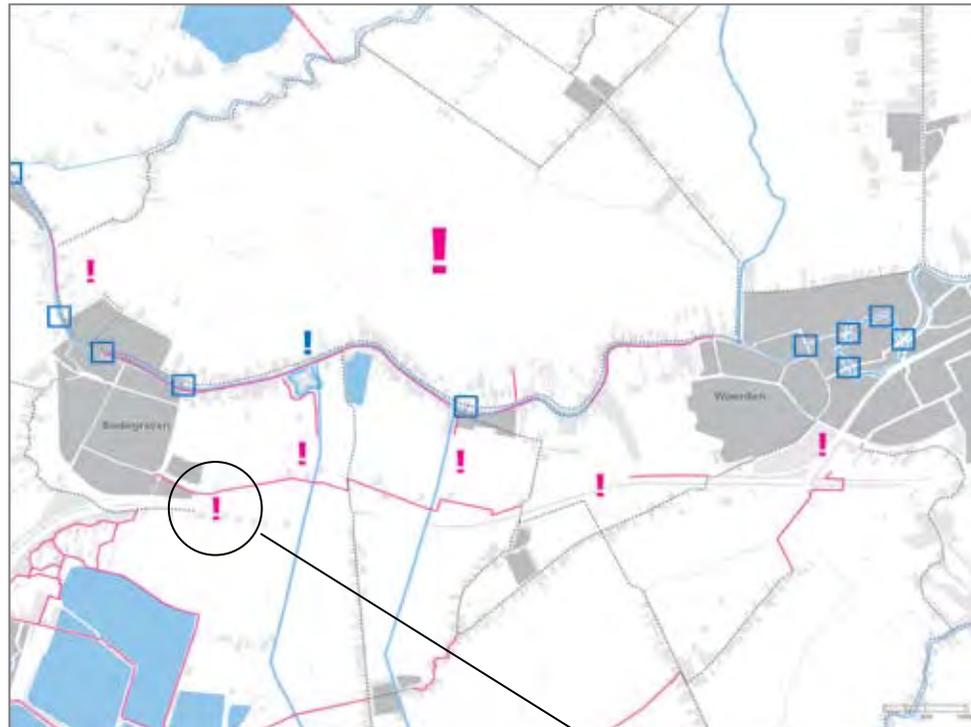
- Road network**
- highway
 - railway
 - regional road
 - local road
 - highway bank
 - highway crossing local road
 - railway crossing local road
 - highway or railway crossing water course



- Farm paths network**
- farm path

Cycling network

-  cycling path
-  road
-  missing link
-  missing link river crossing
-  existing river crossing



Walking network

-  walking path
-  road
-  missing link
-  missing link river crossing
-  existing river crossing



Cycling and walking network

The cycling and walking network of the area is limited, just like the road network. However, for the cycling and walking network this is considered to be negative. The situation north of Oude Rijn differs from the southern side. North of Oude Rijn the rural area is inaccessible. Therefore cyclists and walking people have to walk along the regional road. This does not seem to be attractive for recreants. The southern bank offer recreants more possibilities. Here, the historical 'jaagpad' is located. The rural area is accessible by rural roads and on some places rural roads have been connected by bridges for only cyclists. Walking people have the possibility to walk along the watercourses Enkele Wiericke and Dubbele Wiericke, which brings them to the educational and recreational fortress of Wierickerschans.

Both the cycling and walking network miss essential connections. Sometimes barrier prevent a connection between tracks and sometimes links are missing. Besides, the walking network is insufficient in the surroundings of the towns of Woerden and Bodegraven. Inhabitants are not able to enter the countryside, although they live very close.





Ecology and cultural history; alder trees as timber resource (the Bovenlanden)



Recreation; fishing (Nieuwkoopse Plassen)



Agriculture; dairy farming (near Woerden)

Use of nature

The case study chapter discussed activities in the area of Oude Rijn. This paragraph focuses on activities related to the use of nature. By the exploration of use, we try to link Green Heart policies to different roles of nature and to implement these different roles in the local patchwork principle. We distinguish three categories: ecology and landscape, education and recreation, and agricultural activities.

Ecology and landscape

The development perspective mentions the realization of a Wetland Corridor between Nieuwkoopse plassen and Reeuwijkse plassen. The ecological corridor enables species to cross the peat meadow landscape of the Green Heart. In current plans, the corridor is planned along the watercourse 'Enkele Wiericke'. A strip along the watercourse is meant to become nature area of the EHS. This zone crosses the cultivation base of Oude Rijn at the WierickerSchans. This spot is still unoccupied on both sides of the river Oude Rijn. Therefore the barrier is limited for migrating species. Two ecosystem targets have to be realized: marshland and natural grassland.

Apart from the Wetland Corridor, many other small ecological valuable areas exist. Some farmyards, reed banks or extensively used grasslands function as habitat for specific species. Also watercourses and back-side dikes are valuable from an ecological perspective. Line elements, large nature reserves and local habitats together determine the ecological value of the area.

Different from ecological nature is landscape nature. Landscape issues are very present in the development perspective. The appointment of the 'window area' is especially related to the preservation of the peat meadow landscape. Landscape is dependent on the existence of natural elements. Trees, woods and yard planting determine the scenery, while green elements are positively valued by most people. Moreover, the landscape shows something of cultural history. Lines do not exist by accident, but remind of the cultivation pattern and history. This counts as well for the water system. Ditches, canals and water courses do not only have ecological qualities, but are valuable from a landscape perspective as well. Ecology and landscape have in common that many times people intend to conserve them because they appreciate the view, derive identity from them or associate them with peace and quietness.

Education and recreation

People value ecology and landscape because of a the positive experience of nature. Many of these experiences have to do with recreational activities, although most recreational activities might threaten ecology and landscape qualities. Different consumptive uses of nature exists: extensive nature recreation like bird watching; regional landscape recreation like hiking and cycling; education (regional, national, international); local recreation like walking and cycling small distances; active recreation like canoeing; and accommodation like camp sites. Educational and recreational roles of nature are part of the development perspective as well.

Extensive nature recreation

Extensive nature recreation is closely related to ecological qualities of nature reserves. This category of recreants likes to observe plant and animal species. The area of the Wetland Corridor is special for them because of species from wetlands and the peat meadow landscape. Extensive nature recreation asks for specific facilities like an extensive route network through nature key areas and bird watching places. The area of Oude Rijn itself is not interesting for extensive nature recreation. Ecological key areas of Nieuwkoopse plassen, polder Zegveld and Reeuwijkse plassen are favorable.

Regional landscape recreation

Different from extensive nature recreants, regional landscape recreation prefer landscape more than ecological wilderness. People of this category like cycling or hiking for one or more days. Some of them use national and regional route networks. They like variety between agricultural and natural landscapes. Moreover, they like the peace and quietness of the rural area. Cycling and walking tracks might open up the countryside and connect to the recreational centre of Wierickerschans. Important part of the network is the connection to train stations of Woerden and Bodegraven.

Education

An important objective of recreational plans of the area has to do with education about the Green Heart. The fortress of Wierickerschans has a central position in these plans. The fortress is the starting point for recreation in the area. Besides, the fortress has a promotional function

for the Green Heart and regional products.

Landscape plays an important role in the educational objective. The government mentions different characteristics of the peat meadow landscape: large openness, strip parcelling with a high percentage water-land, green characteristics of planted dikes and 'kades' (Ministerie van Volkshuisvesting, 2004). Nature contributes to the experience of the Green Heart as a national landscape. Moreover, the fortress is also used for nature education itself and for distribution of agricultural products of the area. Recreation and education come together in the fortress.

Local recreation

Local recreation is related to people living in the neighbourhood of the area; especially those people who live in the towns of Woerden and Bodegraven. Local recreation facilities contain footpaths for at the most a one hour walk (with dogs). Those tracks are especially valuable in the zone between town and country, which contributes to a robust town-country transitional stage.

Different kinds of local recreation contain activities related to a specific place, like allotment gardens and forage nature. The first is mostly used by adults, while the latter is especially valuable for children.

Active recreation

Contrarily to the previous recreational use of nature, active recreation and accommodation is not always appreciated by nature conservationists. These recreational activities disturb ecological and landscape qualities more than previous categories. However, fishing, canoeing

and swimming do not always cause problems. Robust nature is more resistant to active recreation. Canoeing on the river Meije, Oude Rijn, Nieuwkoopse plassen and Reeuwijkse plassen are examples of this use. Apart from considerations on categories of recreation, intensity of recreational activities is very relevant.

Accommodation

Recreational roles of nature appear as well in accommodation. These areas most times have limited ecological qualities. The value of nature is especially in the experience by people. The quality is related to consumptive use. Different types of accommodation can be mentioned like: camping sites, cabins, holiday houses, care farms and residential houses by urban people.

Accommodation is not explicitly mentioned by the regional development perspective. Many times these activities come in existence by private initiative. Moreover, accommodation is often not related to nature or nature experience. On the contrary, parks with holiday houses are considered to threaten the openness of the landscape.

Agricultural activities

Agriculture

The agricultural use of the area is mainly limited to dairy farming, producing milk. These farms have a dependent relation with the land (contrarily to for example pig farms or fungi farms). Therefore agriculture needs space for farming. Besides, agriculture needs land which is acces-

sible for cattle and machines. Because of subsidence and changing water management the accessibility of land is threatened. Intensive agriculture has limited development possibilities in the area.

Broadening

Agriculture offers special opportunities for many activities. Concerning production, this might result in specialization. Production of special regional food and products anticipates on the demand for quality and identity. Some farms sell their own products in farm stores or sell them in 'local food stores'. Consumption and production come together in local food: farmers focus on quality instead of quantity, while these products intensify the experience of the region for tourists and local people. Other possibilities are related to conservation activities: maintenance of landscape elements or agricultural nature conservation. Nowadays, conservation is paid by governmental agencies and therefore only guaranteed for a limited time. Some experiments with private initiatives might have potential.

Regional food market

Related to agricultural specialization in regional products is the regional food market of Woerden. One time a week, Woerden accommodates this market with different qualitative products. This market contributes to the relationship between town and countryside and makes farmers ambassadors of the countryside instead of agricultural industrialists. In this way, the food market strengthens the experience of (natural) qualities of the countryside by urban people.

Recreational and care facilities

Several farmers offer recreational and care facilities. Apart from production related services, they have camping sites, organize games for groups, exploit tea gardens, rent canoes and offer care facilities for disabled persons and people with psychological problems. These facilities are most times clustered around the farmyard. Because most farms are located along the cultivation base, also these facilities follow the spatial structure of peat meadow mosaic.

Design assignment

Combining policy ambition, exploration of landscape and networks, and the use of nature, we are able to formulate our design assignment. The assignment is based on the local patchwork approach. We distinguish ecological, landscape and recreational aims for the design, corresponding to the different roles of nature.

Ecological permeability

We aim for the realization of an ecological connection for wetland species. Wetland species need more wetland habitats between ecological key areas to reach next key area. The other group of species mentioned by ecological aims are species dependent on grassland and small water. This habitat is more common in the area, but not always suitable as a habitat. The quality of those habitats has to be increased. The most important species of the peat meadow landscape are the meadow birds. Most of them do not need a connection; they bridge distances

by flying. Creating new ecological key areas facilitates also meadow birds.

Landscape experience

Many landscape issues come together in the area of Oude Rijn. Firstly, National Landscape policies emphasize the unique peat meadow characteristics. This is embedded in the appointment of the 'window area', which aims for an intensive landscape experience from the highway and within the area. Moreover, the transition between town and country is not robust and sustainable nowadays. This threatens current and future landscape experience. Although the Old Dutch waterlines of defence is only marginally recognizable in the landscape, the part between both Wierickes is remarkable, especially in combination with the fortress of Wierickerschans. The design aims for a contribution to these different aspects to landscape experience.

Recreational facilities

Concerning the recreational use of nature, different issues are important for the design. Firstly, limited recreational networks have to be extended by connecting different paths and the construction of tracks. Also local walking routes have to be developed, especially along town borders. Apart from new paths, recreational facilities also contain more interactive use of nature like allotment gardens, accommodation facilities and forage nature. Finally, also the recreational node of Wierickerschans is important concerning information about ecological and landscape issues.

This paragraph presents a translation of the design assignment into a conceptual design. Different steps are taken to realize the conceptual design.

Firstly, we developed planning principles and strategies. Apart from implementation of planning and design concepts, we invented different strategies anticipating on different use of nature. Secondly, we thought of different elements for the local patchwork. Then, we looked for possible combinations and interactions between networks, being aware of the regulating effect of networks on use.

Planning principles

Dutch spatial planning traditionally is based on zoning of land use. In practice, land is often used for multiple functions. The other way around, new policies are developed stimulating multifunctional use and additional use. The scarce space of the Netherlands asks for efficient use.

We already elaborated on the mono functional scope of the EHS concept several times. The concept does not take into account the diverse functions of space by different people and an efficient use of the space. Although the EHS might be efficient concerning biodiversity goals, the space is used inefficient concerning other purposes. A merging of water retention, nature areas, recreation and agriculture on the same spot is more efficient. Although there is more space necessary to reach all purposes for every single function, the total space amount of space needed is smaller.

The term 'function' suggests that a functional zoning facilitates use. However, it is debatable if that is true if we leave a strict division of use in functions. Use is more diverse than a single function. A farmer uses his land for different functions: for economic purposes, he attaches cultural values to his land and he experiences his land as natural area. Besides, his land has a recreational value for people of the near village, the ditch around his land is used by different water birds, while the trees around his house are the habitat of hedgehogs, rabbits and mice. By a strict zoning, the different use of the area decreases because it becomes optimized for only one type of use.

Mutualism

The local patchwork is an example of what has been called 'mutualism' in biology. The concept combines a strengthening of the ecological connection between key areas with an increasing social benefit of nature. Strengthening of the natural landscape is possible by broadening of the scope of nature investments. If more people profit from investment, more investments are legitimate. This results in both a robust ecological landscape and a qualitative everyday environment.

Moreover, we think that the development of the local patchwork is cost effective. Clustering of agricultural subsidies, water management costs, EHS funds, recreational investments and budgets for cultural history results in a large budget for the development of one local patchwork, which meets different aims. In this way, more objectives can be reached by the same investments. We only explored this issue on a conceptual level. A detailed financial investigation and calculation has to be part of further research, like a detailed ecological research is necessary to predict the effect of the local patchwork for specific species.

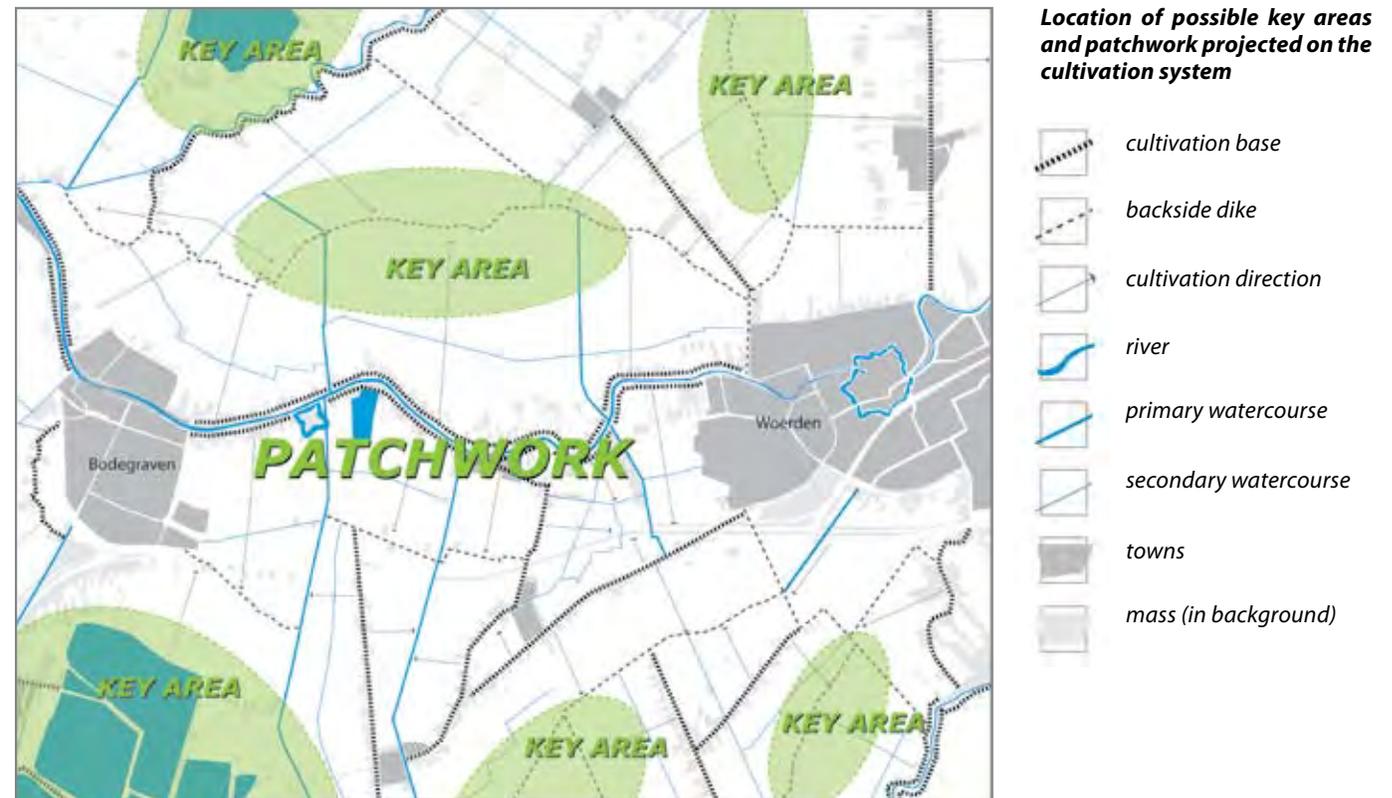
Sustainable spatial structure and organization

The design intends to create a sustainable spatial organization, which stimulates a prudent development of the area. With sustainability we mean ecological, hydrological, spatial and cultural sustainability. Ecological sustainability is about the conservation of biodiversity. Hydrological sustainability is about a water strategy which prevents a waste of rain- and seepage water and pre-

vents further settling of the soils. Spatial sustainability is about creating a durable town – countryside relationship, avoiding a further urbanization of the peat meadow landscape. Urban developments are developed on appropriate spots. Cultural sustainability is related to the cultural value of the landscape. With the design we contribute to the further development of the cultural landscape. Apart from different sustainability issues, the focus is on spatial sustainability in structure and organization. Emphasis is therefore on pattern and use. Pattern is related to different strategies for nature, use is regulated by network design.

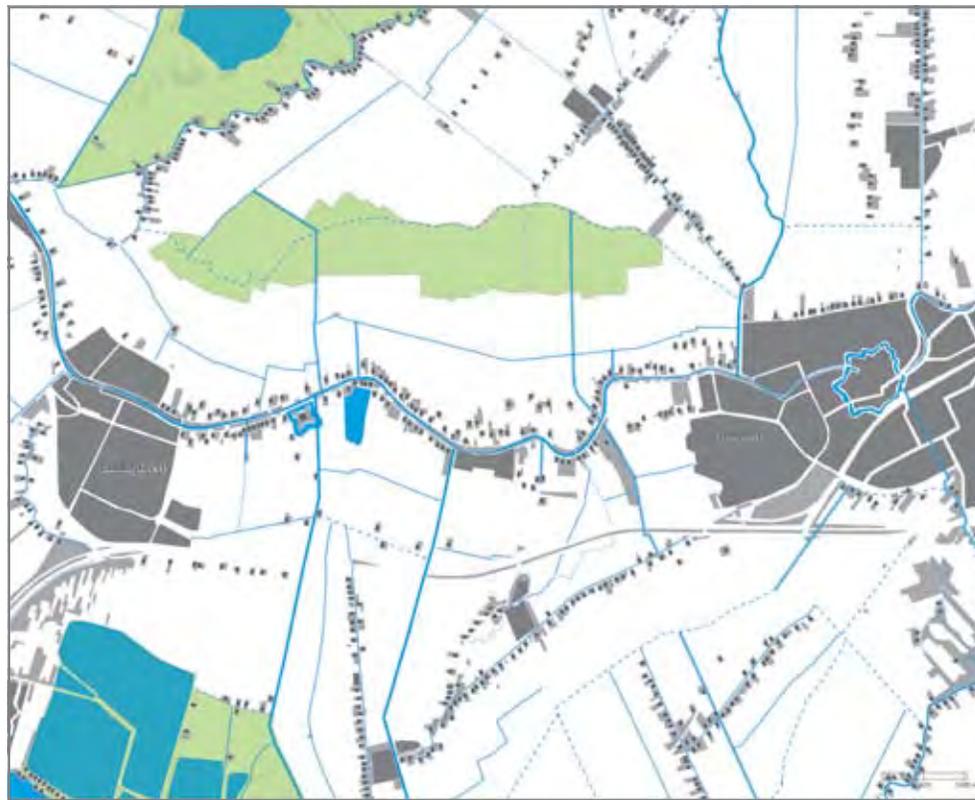
Encouraging instead of banning

Design solutions in a complex context like the case area of Oude Rijn only work if they are linked to considerations about how they can be realized. In our planning approach we are realistic. We do not rely too much on the juridical power of legislation and other bans. We prefer solutions which encourage behavior and developments in line with the design. We are not too pretentious about what exactly can be realized as proposed. Like the design, planning is based on the arrangement of the road network and the water network. Consumption is linked to networks, while conservation is clustered in extensively used parts of the water system. Besides, a conceptual zoning is part of the design. This is exemplified by different nature strategies.



Elements of the local patchwork

The design explicitly spends attention to different parts of nature. We distinguish the local patchwork and ecological key areas. Nature in the local patchwork can be related to interactive nature which is mentioned by Buijs and Luttik (Woestenburg et al., 2003). Nature in ecological key areas is different, not as intensively used and has a larger scale.



-  key area
-  lake area
-  river
-  primary watercourse
-  secondary water course
-  backside dike
-  other watercourses
-  built area
-  planted area

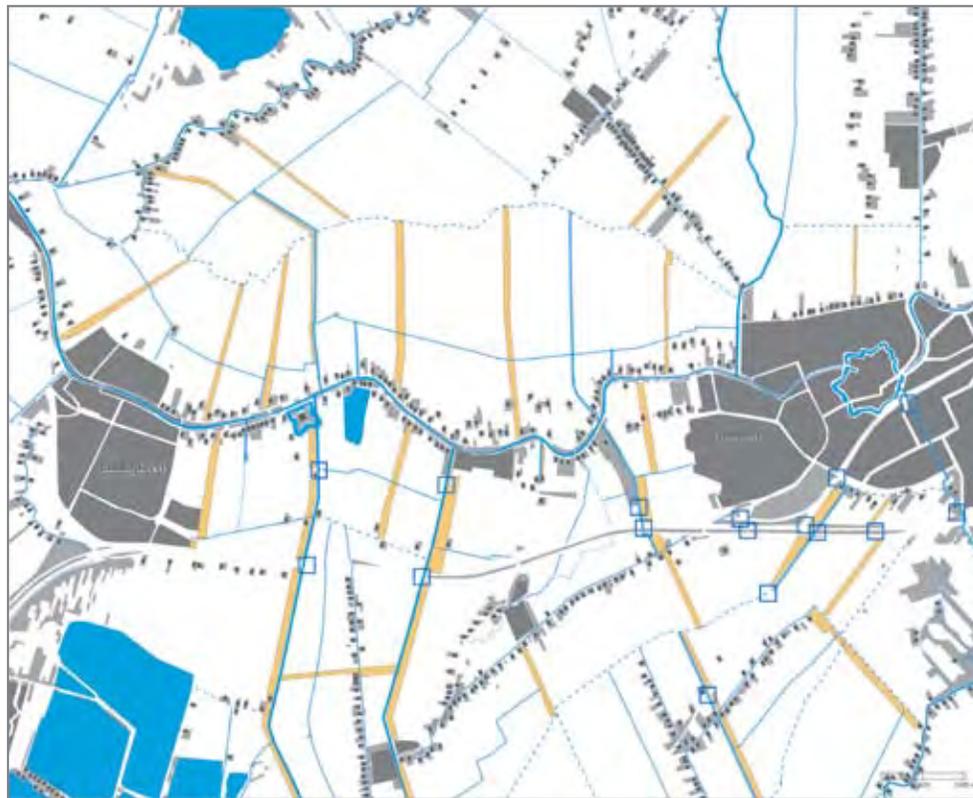
Key areas

The patchwork approach is based on an alternation with ecological key areas. Therefore an analysis of suitable locations for ecological key areas has been done (see map on the left page). Some of these areas are already appointed. For the conceptual design a selection of these areas is made.

Nature in these areas is developed ecologically, respecting the characteristics of the peat meadow mosaic. Apart from target species of the Wetland Corridor, some of these areas are especially valuable for meadow birds. Meadow birds do not need a corridor to migrate, but the peat meadow landscape is a very important brooding place for them. For example, the Dutch peat meadow landscape accommodates the largest population of black-tailed godwits (grutto) of Europe. By replacing peat meadow by wetlands, this habitat disappears.



Key areas are useful as habitat for meadow birds and for the preservation of typical peat meadow landscapes (poor grasslands at the Nieuwkoopse Plassen)



-  marshland strip
-  crossing with highway or rialway
-  lake area
-  river
-  primary watercourse
-  secondary water course
-  backside dike
-  other watercourses
-  built area
-  planted area

Marshland strips

The natural patchwork can not only realized by increasing ecological values of agricultural fields, recreational areas or residential lots. Apart from many voluntary, subsidized or spontaneous developments, a natural framework is necessary for both landscape, ecological and recreational purposes. The construction of this natural framework is primarily the responsibility of governments. The framework can therefore be viewed as a traditional way of nature development. Government agencies acquire agricultural fields, while maintenance is done by nature conservation organizations.

For the peat meadow landscape the construction of marshland strips is a possible solution. Inspired by the *boezemlanden* in case Krimpenerwaard, these strips show many similarities. Marshland strips have a historical function as water retention areas. Different from the original function of the *boezemlanden* in the area of Krimpenerwaard, the water is not necessarily drained into the river, but saved for dry periods when there is a water shortage in the area. In this way, nature development is linked to water management. Moreover, benefits for ecological purposes are double: the surface of nature areas increases while less low quality water from outside the area is necessary to maintain water levels.

Marshland strips have recreational qualities as well. Especially, dry parts might have an important role in short or long walking tracks.

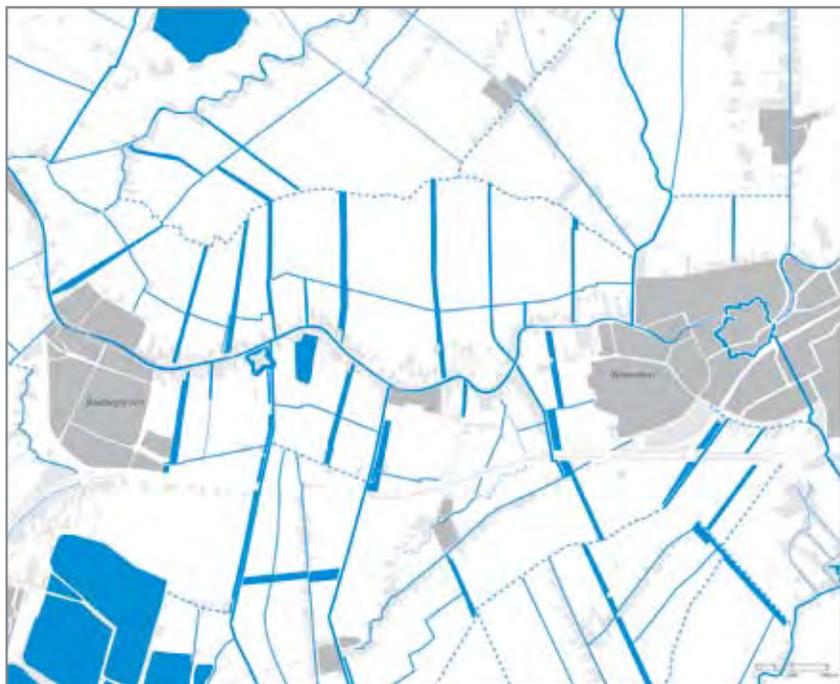
Finally, the strips might have an important role in controlling the accessibility of nature areas. Waterfronts can be used to close areas or grant only limited access (by foot). Moreover, the construction of marshland strips also can contribute to a limitation of urban development.



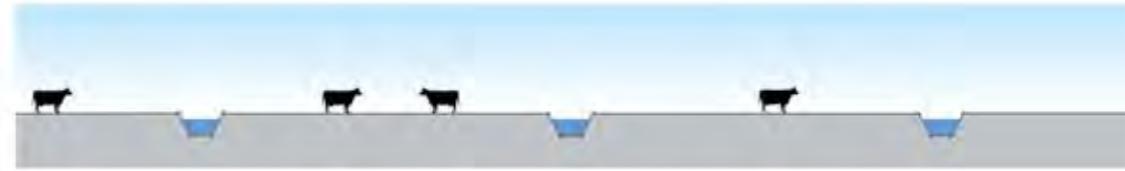
Marshland strips are not only useful as habitat but can also contribute to local water storage



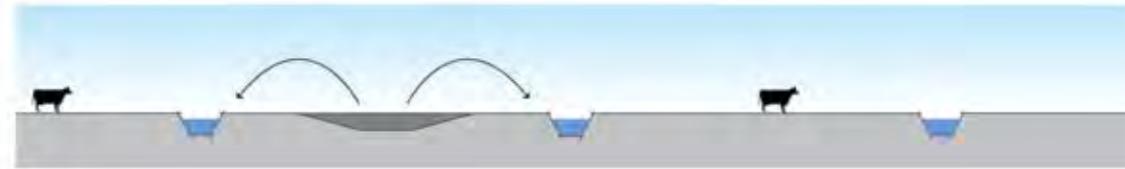
Main elements of the water system as it exists nowadays



A water system with marshland strips might contribute to a reduced inlet of water from outside the region. The region itself can store and supply its own water.



Existing peat meadows



Digging out single or double parcels to create wet conditions for marshland strips. The removed soil is used to create little dikes



Accessibility is restricted by leaving a ditch between path and marshland



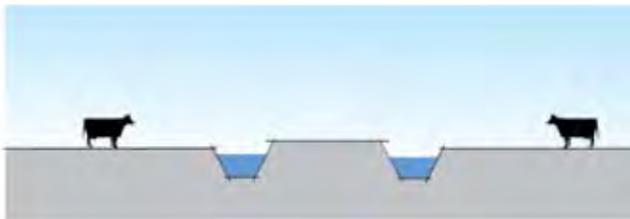
If access is allowed, this can be done by creating a path on top of the little dike



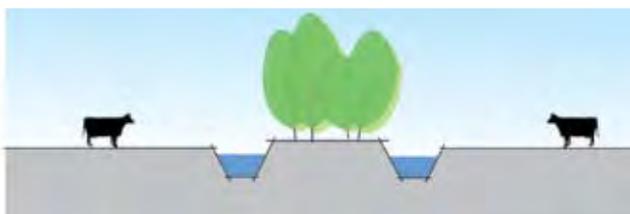
Water can be stored in wintertime and used again during summer.

Backside dikes

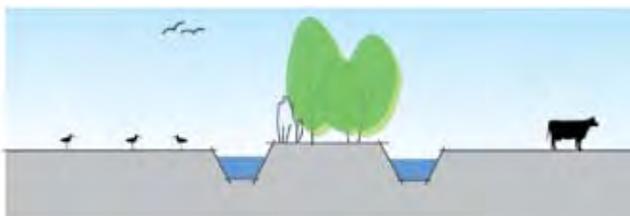
Cultivations of the peat meadow mosaic are characterised by fixed sizes. At the backside of cultivations most times a dike separates the water management system from neighboring cultivation. Many times, these dikes are planted or used to be planted with shrubs and trees. Some dikes have been used for access of cattle as well. Nowadays, some dikes contain hiking and cycling paths. Maintenance and restoration of dike planting and development of new paths facilitates recreation, contributes to (cultural) landscape experience and might improve ecological qualities of polders.



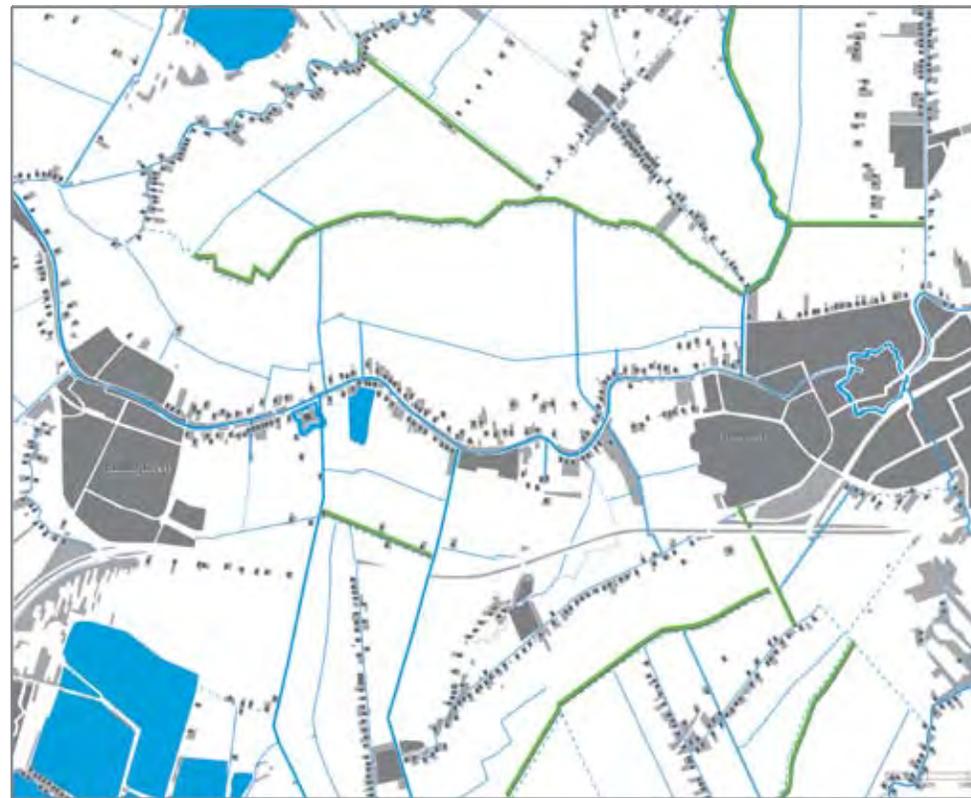
Nowadays, many backside dikes are inaccessible and sometimes not planted



We propose to plant all backside dikes with shrubs and small trees



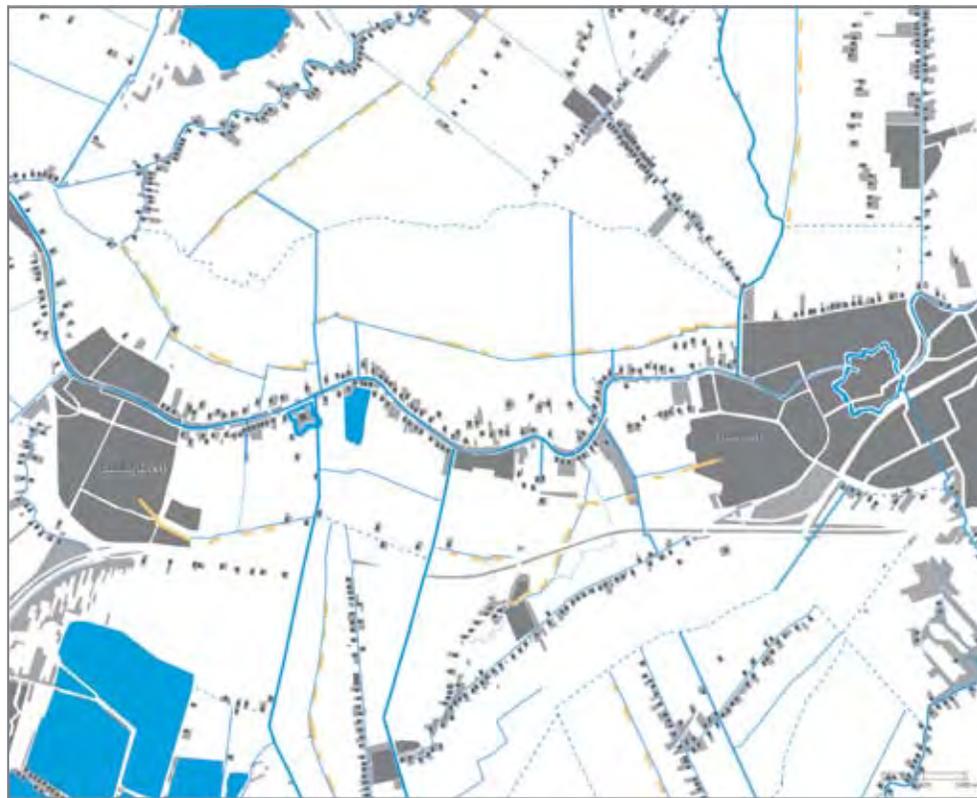
Walking paths can be added. Ditches and planting regulate access and people's view



-  planted backside dike
-  lake area
-  river
-  primary watercourse
-  secondary watercourse
-  backside dike
-  other watercourses
-  built area
-  planted area



Example of a planted backside dike that is accessible (Hollandsche Kade)



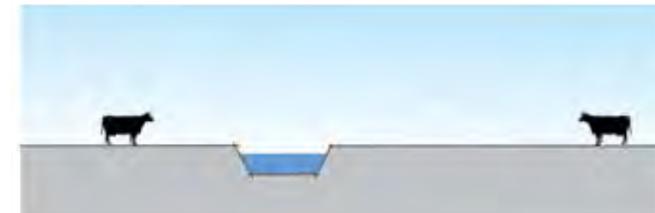
-  reed shore along backside watercourse
-  lake area
-  river
-  primary watercourse
-  secondary water course
-  backside dike
-  other watercourses
-  built area
-  planted area

Reed shores along backside watercourses

Apart from dikes, the patchwork is improved by the realization of strips along backside watercourses. Reed will occupy these strips, while the slight bank gives animals the possibility to enter the bank. Moreover, the shallow water is a suitable place for mating fish (Van Paassen and Schrieken, 1998). The strips are not directly purchased by nature conservation agencies, but come into existence in close collaboration with farmers. By choosing the backside watercourse instead of ditches, an ecological cross connection between marshlands strip is established. Although not every farmer might collaborate and the reed shores do not form a continuous line, even a scattered pattern of reed strips contributes to the ecological permeability of the area. In this case, reed strips function as stepping stones.



Example of a backside watercourse that can be equipped with reeds shores (Krimpenerwaard, Het Beijersche)



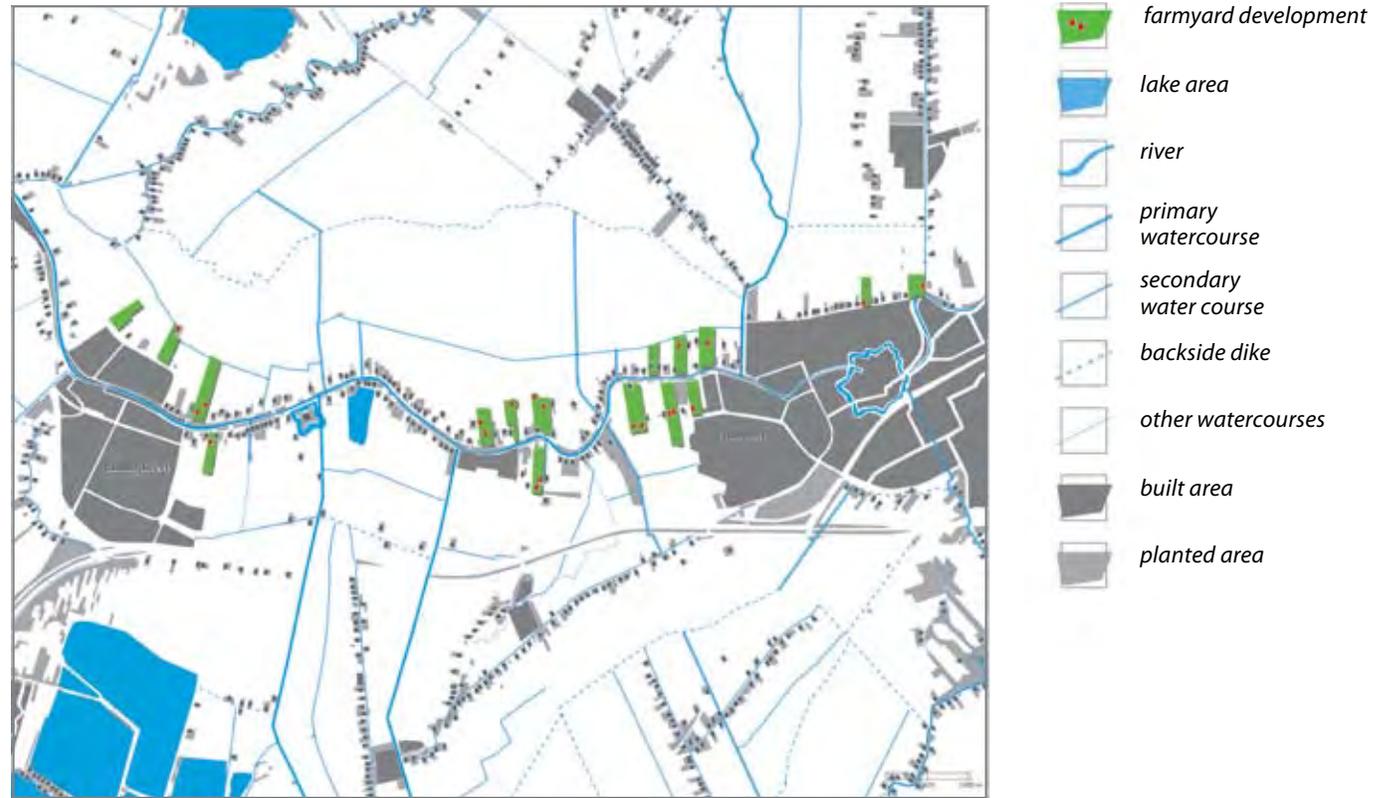
Existing backside watercourse



Reed shores with slight banks can function as stepping stone in ecological networks

Farmland development

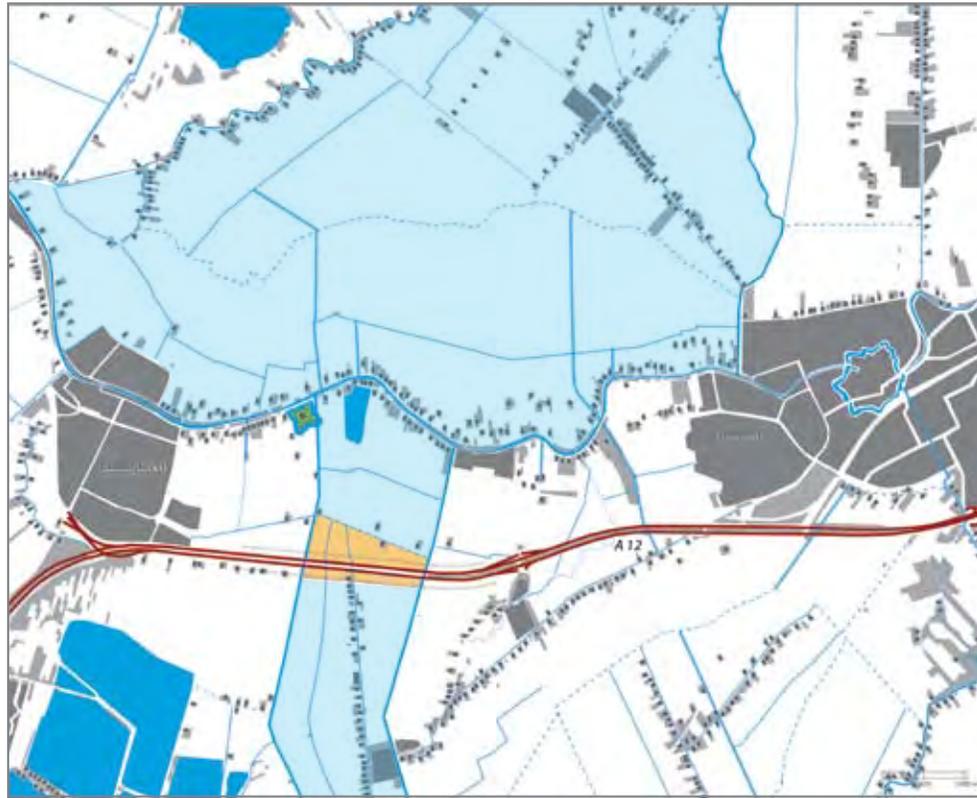
Farmland might have an important role in the coherence of the patchwork. By farm planting and other natural elements on yards, the permeability of residential strips increases. Although farm yards most times do not accommodate many wetland habitats, they might help in the realization of connections through residential strips. Moreover, some species are dependent on the availability of certain elements on the farmyard like owls (Van Paassen and Schrieken, 1998).



Full grown trees, hedges, reed shores, and sheep meadows are examples of ecological and historical elements on farmyards



Information panel about the restoration of ecological shores along farmyard ditches



-  land that could be inundated
-  marshland
-  highway
-  highway bank
-  fortress Wierickerschans
-  lake area
-  river
-  primary watercourse
-  secondary water course
-  backside dike
-  other watercourses
-  built area
-  planted area

Old Dutch Waterline of Defences

The Old Dutch Waterline of Defences isn't recognizable in the landscape anymore, apart from the fortress of Wierickerschans. The waterline will get a central function in the recreational structure of the area. Provincial plans already mention the fortress as a recreational and educational centre. A limited part of the waterline is inundated to make the historical function of the area visible again. This can be perceived from the highway. Moreover, this area will become a large entity between ecological key areas.



Location where one of the main watercourses (Dubbele Wiericke) crosses the highway. The latter is elevated (south of Nieuwerbrug)



Entrance to fortress Wierickerschans.

Conceptual design: elements



-  meadow reserve (key areas)
-  marshland
-  reed shores along backside watercourses
-  backside dikes
-  farmyard development
-  fortress Wierickerschan
-  lake area
-  river
-  primary watercourse
-  secondary watercourse
-  backside dike
-  other watercourses
-  built area
-  planted area



Planted backside dike (Zegveld)



Marshland

Accessibility of the local patchwork

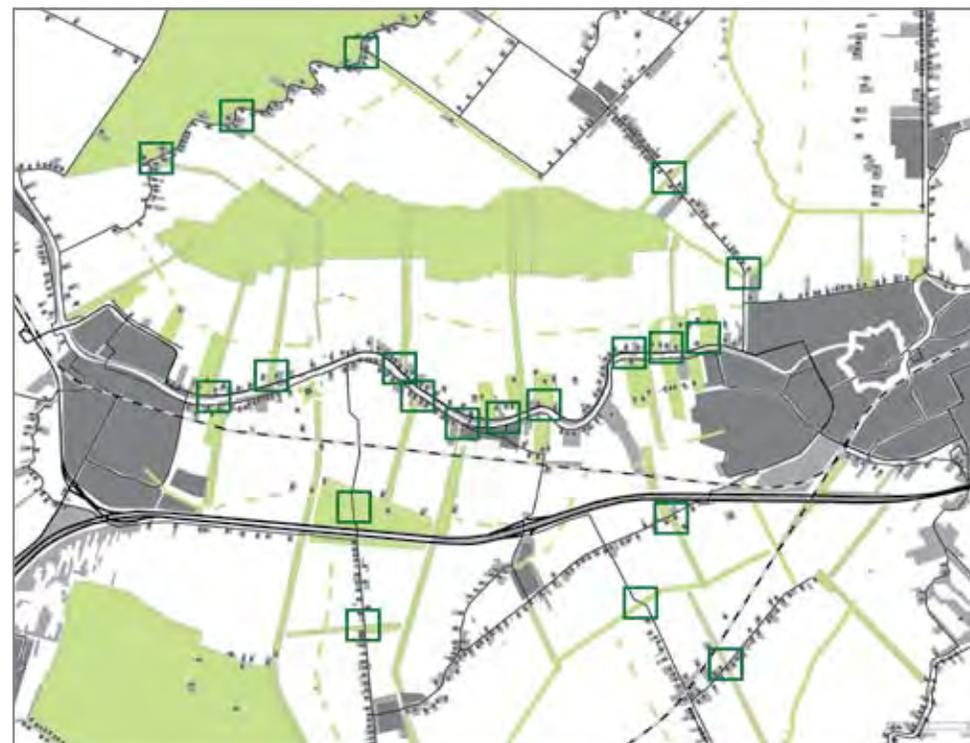
Different networks cross the area of Oude Rijn. These networks grant access, but also determine which access is possible by hierarchy. Cars only have the possibility to enter the area by roads in the occupation strips and few secondary roads which open up the rural area.

Activities need a network to exist. Regulation of intensities of activities is therefore possible by designing the network. Current network design already regulates the intensity of use in the area very efficient. The large inaccessible polder between Woerden, Bodegraven and Zegveld is unique. However, the polder will remain open and extensively used if only cyclists and long distance hikers get access to the area. On the other hand, intensive recreation can better be concentrated in the occupation strips to prevent disturbance. We distinguish two levels in the water network. While motor boating possibilities are limited, canoeing is almost everywhere possible. However, canoeing people encounter different barriers.

Important is the interaction between different levels of the network. This counts especially for the interaction between road network and on the other hand walking, cycling and canoeing networks. Nodes emerge where people leave their car or train to continue their way by foot, bike or canoe.

Road network

We spend explicit attention on the design of the road network in both intensity and priority. Intensity and priority together determine the disturbance of nature, while



Accessibility: road network

- highway
- railway
- regional road
- local road
- crossing between road network and nature area
- nature areas (local patchwork and key areas)
- built area
- planted area



Accessibility: boating network

- navigable water
- crossing between boating network and nature area
- nature areas (local patchwork and key areas)
- built area
- planted area

Accessibility: cycling network

- existing bicycle path
- new bicycle path
- road
- existing river crossing
- new river crossing
- nature areas (local patchwork and key areas)
- built area
- planted area



Accessibility: walking network

- existing walking path
- new walking path
- road
- existing river crossing
- new river crossing
- nature areas (local patchwork and key areas)
- built area
- planted area



on the other hand it regulates accessibility to nature for recreational purposes. Therefore we strive for an extensive network when crossing ecological valuable areas and clustering of recreational facilities outside these areas. The road network threatens the ecological permeability; therefore several fauna passages need to be constructed.

Boating network

Apart from the river Oude Rijn and the watercourse Dubbele Wiericke, accessibility to the elements of the local patchwork is limited. Only by canoe, the small ditches are accessible, although many sluices and pumping stations are important barriers.

Cycling network

The current cycling network has many gaps. Moreover, the network is limited: the area north of Oude Rijn is inaccessible. By realizing a connection between Nieuwerbrug and Zegveld, the people from the south are able to continue their track on the north bank. Moreover, the new nature area is opened up by the new path. South of the Oude Rijn lacking paths are added.

Walking network

Footpaths are missing especially on the north bank of the river Oude Rijn. By a combination of footpaths and boezemlanden interesting walking tracks can be developed. Moreover, a footpath can be easily added to the backside dike.

Especially in the surroundings of Bodegraven and Woerden a denser walking network is desirable. By using some farm paths and marshland strips short rounds can be made.

Conceptual design: accessibility



-  highway
-  railway
-  road
-  cycling network
-  walking network
-  boating network
-  nature areas (key areas and local patchwork)
-  built area
-  planted area



A farmers path can also be part of recreational routes (near Bodegraven)



The dike of the watercourse Dubbele Wiericke is also a recreational track

Different nature strategies

For several decennial, nature planning in the Netherlands was based on a defensive strategy. This threatened the quantity and quality of nature as the destruction of nature was only slowed down. That was a reason for a changed strategy. By the Nature Policy Plan, the government chose for an offensive strategy. Ahern mentions besides these two strategies, two different landscape planning strategies: a protective, and an opportunistic (Ahern, 2002). The different strategies react on different conditions of the landscape. Ahern shows that different strategies react on different conditions. Without copying strategies, we think different roles of nature ask for different strategies. In general, also the proposed strategies by this study are offensive because they ground in nature development.

Conceptual zoning

The design is build on three different zones which fade into the neighboring zone along river Oude Rijn. This

zoning links up to both the intensity of land use and the different use of nature. The extensively used areas are zoned as ecological key areas. These areas are managed by a conservation strategy. Ecological purposes have priority, while extensive recreation by naturalists and hedonists is allowed. The second zone coincides with the cultivation base. In this zone nature has a primary consumption function. Recreational activities have priority. The third zone is located between the occupation bases and the ecological key areas. In this zone a landscape management strategy is applied. The landscape management zone is the transitional stage between the consumption zone and the conservation zone. The main user of this area is agriculture, which offers consumption and conservation services.

Conservation strategy

The conservation strategy has to do with the construction of ecological key areas in the extensively used part of the peat meadow mosaic. Government intervention is

necessary to acquire and conserve these areas. This strategy is based on traditional nature conservation: nature is maintained by nature conservation agencies.

Apart from ecological key areas, marshland strips might need a conservation regime. These parts of the local patchwork will be maintained by water authorities. Also present EHS is partly maintained by water authorities, because they often follow watercourses, dikes and banks. Especially for the peat meadow mosaic, which is characterised by an intensive water system, a major role for water authorities seems obvious. Moreover, apart from their natural function, marshland strips will be used especially for water management purposes.

The conservation strategy is supported by legal protection. Like the current approach of the EHS, areas within the conservation strategy are appointed to be nature areas. Agricultural, commercial and residential development is avoided by this legal protection. According to EHS zoning plans of the province of Zuid-Holland, in the area of Oude Rijn this zone is limited to a tight corridor along the water course of Enkele Wiericke.

The local patchwork asks for a different boundary of the legal EHS. Apart from ecological key areas, appointing specific locations for marshland strips makes not much sense. Firstly, the location of the strips should be flexible. Secondly, concerning the interest of farmers, we can not simply appoint parcels randomly. Choosing the location of marshland strips therefore should be done in cooperation with farmers in a regional planning process. Legal protection is limited to the obligation to acquire at least a fixed amount of hectares spread over a fixed amount of marshlands within a specific area. This obligation should

Strategy	Protective	Defensive	Offensive	Opportunistic
Landscape	Supports resource goals	Developments opposing resource goals	Deficient to resource goals	Contains unique elements or patterns
Plans	Defines what is desirable	Defines negative influences	Proposes desired future	Defines unique elements and patterns
Action	Indicate areas to accommodate changes	Slow down negative influences	Restoration of lost values	Conservation of remaining elements

Strategies for nature planning
Source: Ahern (2002)

be part of contracts between province (the coordinating party) and the water authorities (the executive party).

In specific cases, farmers might be willing to cooperate in realization of marshland strips, while they remain owner of the parcel. That might be the case if farmers get income activities different from production. Another possibility is in farmers willing to sell one parcel. In both cases, a complex regional planning process can be avoided or simplified.

Landscape management strategy

A landscape management strategy is especially important concerning the permeability of the rural areas. Although marshland strips contribute to ecological connectivity very much, this solution is primarily based on corridor thinking. Landscape management is based on nature conservation services by farmers. Like nowadays, farmers can get subsidies for specific landscape maintenance.

Some maintenance is focussed on species, some on the maintenance of landscape. Recently the focus of subsidies shifted from a focus on species to a focus on landscape, because of disappointing results of species focussed subsidies. However, results depend on the kind of services. The protection of meadow birds is for example very different from realizing an ecological bank or maintaining 'pestbosjes' (small groups of shrubs where farmers used to burry diseased cattle). Different species profit from these services as well. Like the province of Utrecht, we think farmers contribute to a natural landscape, despite disappointing ecological results (Provincie Utrecht, 2007).

Concerning the elements of the local patchwork, the

maintenance of backside dikes and shores of backside canals is the most important contribution. Besides, the development of farm yards is an important proposal, but this might be part of the consumption strategy as well (see below). Also the restoration of the Old Dutch waterline of defence is part of the landscape management strategy. A new wetland area combined with the construction of the highway A12 on piles might improve the perception of the defence work. Moreover, this new wetland connects nature on both sides of the highway.

Consumption strategy

The third strategy anticipates on recreational activities in the area. More than landscape management and conservation, consumption is very dependent on the network for accessibility. Consumption facilities are clustered around the cultivation base, along the major roads through the area. All intensive recreational use is limited to this strip. People who prefer more extensive recreational experiences are able to enter the area by small paths, sometimes unpaved and most times inaccessible for cars.

The consumption strategy however does not only regulate use, but also encourages and guarantees the natural value of the cultivation base. We mentioned already farmyard development as an important solution for cultivation strips. Former farms can get new residential functions and the yard can give space to different interactive use of nature. Also ecological farms can get an important function in the existence of different habitats for small animal species (Van Paasen, et al, 1998). Moreover, the interaction between marshland strips and farm yards

might be interesting. Also mitigating measures have to be taken in the cultivation strips, for example fauna passages crossing major roads.

Most important of the consumption strategy is the use of spontaneous opportunities. Strict legal procedures are not flexible enough to realize the scattered natural pattern in the cultivation strips. On the other hand, leaving space for nature can be regulated by spatial plans. Uncontrolled residential or commercial development does not contribute to the natural value of the residential strip. More detailed considerations on the consumption strategy will be part of the next paragraph.

Based on the conceptual design, this paragraph introduces a design focused on the occupation strip along river Oude Rijn. Four different parts of the design are specified in detailed designs. By the design, we want to explain what different elements are and how they 'work'.

Contextual approach

Every development needs a connection with local contexts: the characteristics of the area determine the possibilities, especially concerning the local patchwork. The recreational parks in the Bovenlanden area have different implications for the landscape design than industrial activities along the Oude Rijn. Every time question rise. What is realistic and what is desirable in an area? What is the direction of spontaneous developments in the area? Guiding spontaneous development asks for clear rules. How is it possible to guarantee a limited residential development and how can land use contribute to nature quality? These questioned will be answered specifically for the design case.

Integration

An important aim of this research is to show the opportunities of integrating different land use and illustrate that different functions all contain more or less natural and ecological values. Integration is based on the contribution of different activities to nature. Integration is contextual because it is not based on laws, but on local initiative and support. Local initiative needs some

stimulating measures in our view. Therefore, it should be combined with limited residential development, subsidies and local networks of nature volunteers. Like agricultural nature, conservation associations nowadays work broader and with networks of people associated with nature are possible.

The design encourages small scale residential developments in the landscape structure if this contributes to the development of a natural landscape. Governments can not be responsible for the development of nature alone; governments are responsible for clear guidelines. We propose to limit new projects for buildings to only replacing existing buildings. Sometimes, further extensions in the landscape structure might be desirable. We advise to combine this with a contribution to the natural landscape by the acquiring of marshland strips and development of interactive nature. To create hard conditions, fixed amounts of hectares of nature development should be related to fixed cubic meters of built up area.

Flexibility

The design is based on flexibility. We do not intend to give the ultimate design for the area, but offer possible solutions and strategies. Moreover, we think the design is more realistic if there are still possibilities for alternatives. Therefore, we do not propose a solution for a one dimensional ecological network, but combine different natural qualities of the landscape. We do not think everything is possible without threatening the ecological qualities. We focus on maintaining the balance between different land use and qualities of landscape, instead of a conservation strategy of fixed objects and places.

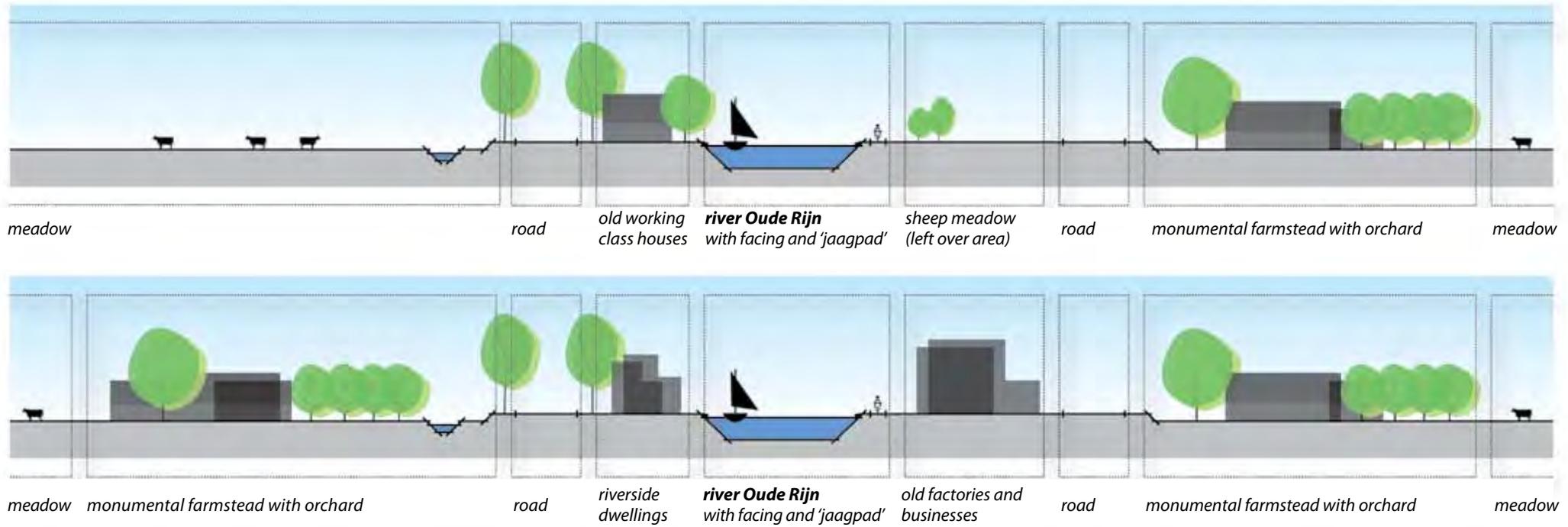
Regional planning

Many planning objectives are nowadays realized in regional planning processes. The realization of the local patchwork needs these processes. The realization of marshland strips is a good example of the necessity of regional planning processes. Acquiring only one or two parcels from different farmers is probably impossible. Farmers do not want to decrease their business in most cases; they need more land to remain competitive. To acquire the desired land, one farmer has to be bought out combined with a reallocation of land. This asks for flexibility, an integration of different objectives and regional planning.

Design considerations

Diversity of occupation strips

In chapter six we discussed the differences between occupation strips in different case study areas. Not only areas differ in possibilities, but also possibilities differ in the same area. An example of design possibilities in the same area is the occupation strip on the natural levee of the river Oude Rijn. On several sports (monumental) farms have been built on the first part of the meadow along the road or away from the road. Many times these farms have their own orchard or small farmyard fields around the farm. Sometimes there are only dwellings between meadow and road, or meadows continue till the road. The latter places are characterized by wide views. The strip on the other side of the road, on the riverbank, is used very differently as well. Some spaces



Land use and dimensions of the occupation strip along the Oude Rijn



Monumental farmstead



Old factories and businesses

accommodate (old) factories and business as commercial activities used to be dependent on the river as transport corridor. Sometimes dwellings have been developed on the riverside. But several spots are still open. Most times these left over areas are extensively used by citizens or farmers for small domestic animals, gardens, orchards or small woodlands.

These differences determine development opportunities for nature. It asks for flexible and varying solutions. Chances have to be taken. Different strategies are necessary to utilize different opportunities. In the following, different possibilities for the occupation strip are analyzed.

Possible locations for marshland strips

The conceptual design contains several marshland strips using parcels which have an uninterrupted connection to the river Oude Rijn. Only the road crosses the parcel close to the river. There are many of these parcels, especially on the north bank of the river (see map). Approximately two ecologically marshland strips have already the dimension of the EHS corridor planned by the province of Zuid-Holland. We intend to make the whole landscape permeable by adding six of them on both sides of the river. Because some of them will be used for recreational purposes as well, a marshland strip is not as effective as a traditional corridor. This is sufficiently compensated by the amount of marshland strips.

All extra marshland strips increase the ecological permeability of the area, the water storage capacity and they create possibilities for recreation as well. But too many of



Grassland fields with an uninterrupted connection to the road



Example of a grassland field connected to the road (near Woerden)



Left over areas along the Oude Rijn



Example of a left over area (Nieuwerbrug)

them threaten the peat meadow characteristics, the agricultural use and also the suitability of the area for meadow birds. We think that about six marshland strips is enough to benefit from the advantages and avoid the disadvantages.

The location choice of marshland strips is well considered. We planned some marshland strips close to the urban areas. Therefore people can profit from new nature, while the strips might contribute to a robust transitional zone between town and county. We prefer marshland strips along major watercourses as well, because of the existing ecological quality of dikes and reed vegetations. We did not plan a marshland strip opposite to the Wierickerschans, to save the wide view on the peat meadow landscape from the fortress. In our opinion, the wide view is part of the perception of the waterline of defence.

Left over areas

We discussed the left over areas in the occupation strip of Oude Rijn. These small fields, gardens and woodlands are most times extensively used and therefore suitable for ecological objectives, combined with their current use. These lands are good locations for construction of shallow riverbanks, where animals can leave the river. On the road side of these areas fauna passages are necessary to make a connection with the meadows on the other side of the road. Besides the ecological function of left over areas, they are valuable elements in landscape experience because of the small scale characteristics and diversity. Moreover, they might be important forage nature areas for children.

Farmyard fields

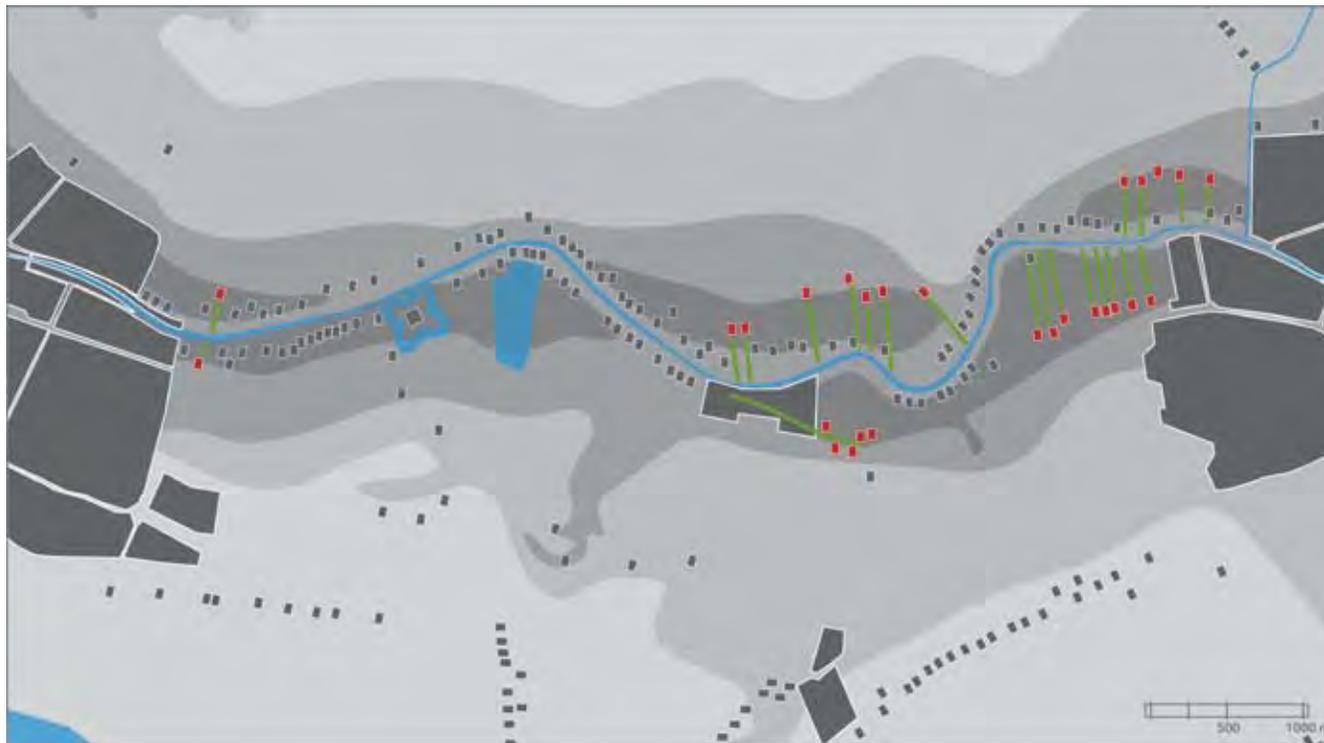
Apart from left over areas, especially the eastern part of the area contains many farmyard fields between the road and farms. Sometimes these fields are used for small cattle or orchards. These fields are important elements in the landscape experience. Firstly, the spaces between road and farms are enclosed spaces. Secondly, these fields have a cultural historical meaning because these fields emphasize the location and status of the farms. Lanes between farms and road contribute to this cultural and visual experience as well, especially when they are planted with trees.



Farmyard fields in between farmyard and road



Due to a wider zone of sandy clay soils, farmyards are located on distance from the road (near Woerden)



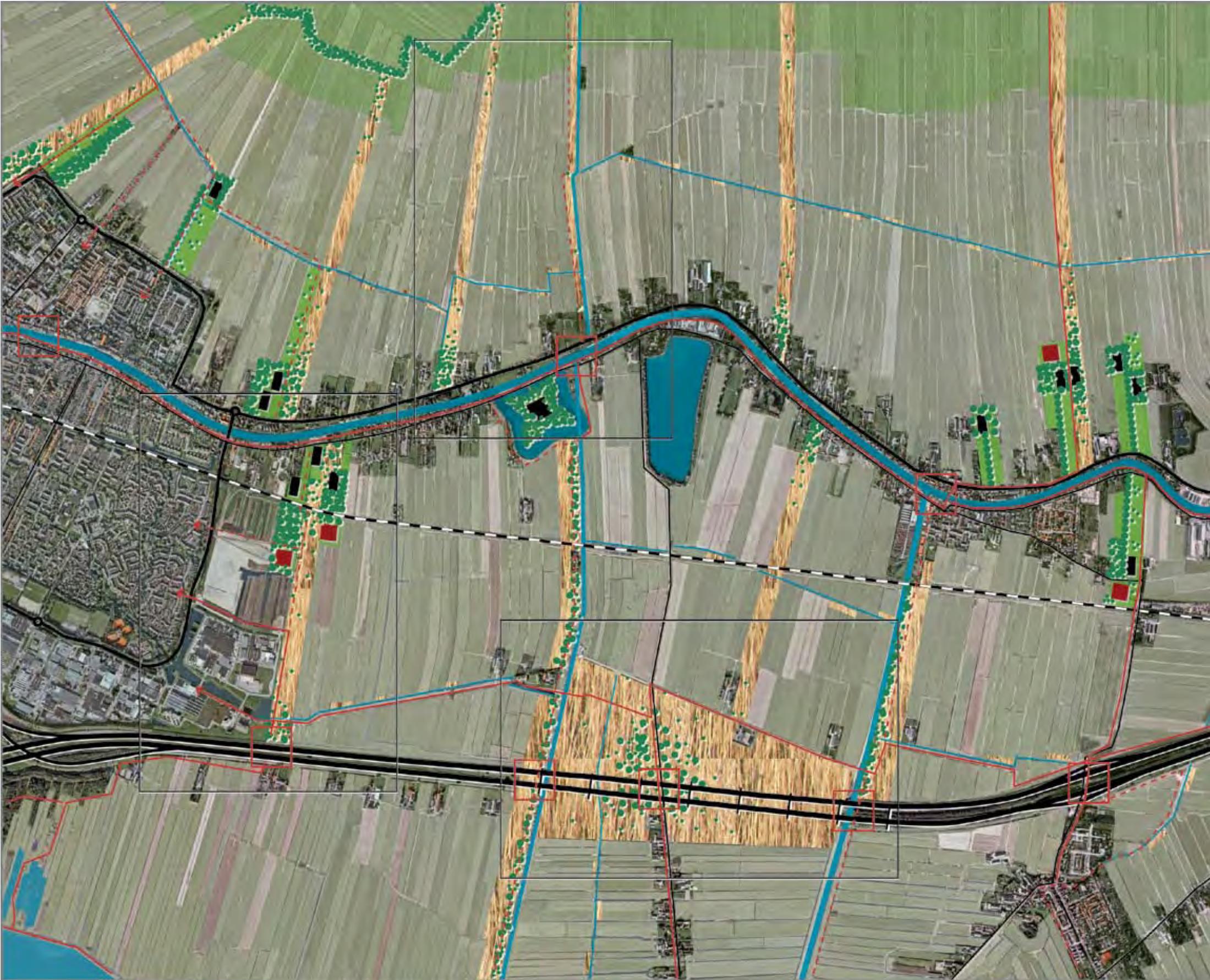
Farmyards located outside the occupation strip

New estate areas on former farm yards

Between Woerden and Nieuwerbrug, the natural levee is wider than elsewhere. Therefore, farms are situated away from the road. They are accessible by lanes between the farmhouses and the road along the river. Some of these farms might stop agricultural activities due to up-scaling and competitors from other parts of the world. These former farm buildings are possible locations for residential development or interactive use of nature. Considering a further decrease of agriculture (especially in area of the wetland corridor), the character of the occupation strips will change. Some farmyards are possible new locations for new estate areas. However, the function of farms and farmyards is often closely connected to the function of the fields behind the farm. Some fields will remain agricultural, others will become property of new inhabitants. A possible new function for the field in the patchwork areas is nature development. In these cases the residential development might contribute to the costs of nature development.

The development of new estate areas, former and existing farmyards is an ecological opportunity as well. An old orchard with standard trees (*hoogstam boomgaard*) might become an important habitat for several species, although most of these species are not specific wetland or peat meadow species. Also allotment gardens or forage nature have ecological potential.







Arrangement 1:25.000

-  *meadow reserve for meadow birds*
-  *marshland*
-  *marshland strip*
-  *reed strip along backside watercourse*
-  *former farmyard*
-  *farmyard development*
-  *shrubs*
-  *planting on backside dike*
-  *river Oude Rijn with roads and bicycle track*
-  *walking / hiking path*
-  *crossing of recreational track with water or highway*
-  *elevated highway*
-  *railway*

Detailed designs

The final design is elaborated in different detailed design, focussing on specific elements of the local patchwork in the area of Oude Rijn. The first two detailed design show different elements of nature in the transitional zone between town and country. The third study is related to rural expressions of marshland strips, while the fourth design treats the waterline of defence.

The zone between town and country

Two different areas have been chosen for the development of detailed designs on the relationship between town and countryside. The development perspective aims for a robust and sustainable zone. We think nature can contribute to this objective in different ways. We consider both restricting effects of nature and development possibilities for towns. The detailed design for the area close to Bodegraven shows how nature can prevent further urban development, while the countryside becomes part of the living environment of urban people. The detailed design for the area close to Woerden shows urban development possibilities which contribute to different roles of nature and a robust and sustainable zone.

Along the border of the town of Bodegraven, including the parts under construction, we planned one of the marshland strips. With this strip we designed a valuable zone between town and countryside. Viewed from the countryside the built up area is camouflaged, while an ecological and recreational area is created. To guarantee ecological values, marshland strips are compartmental-

Residential housing on former farmyard contributes to an attractive town border

Allotment gardens and playgrounds on former farm yard

New housing area

Bicycle tunnel underneath highway A12 makes a direct connection with Reeuwijkse Plassen

Bodegraven
1:10.000
(legend on page 196)





Marshland strip near housing area. This section of the strip is ecologically permeable and also accessible for people. They can enjoy a wide view of the countryside.



Marshland strip near business area. This section of the strip is ecologically permeable but inaccessible for people



Allotment gardens on former farmyard



Planking paths through marshland strips



(Semi) public orchard

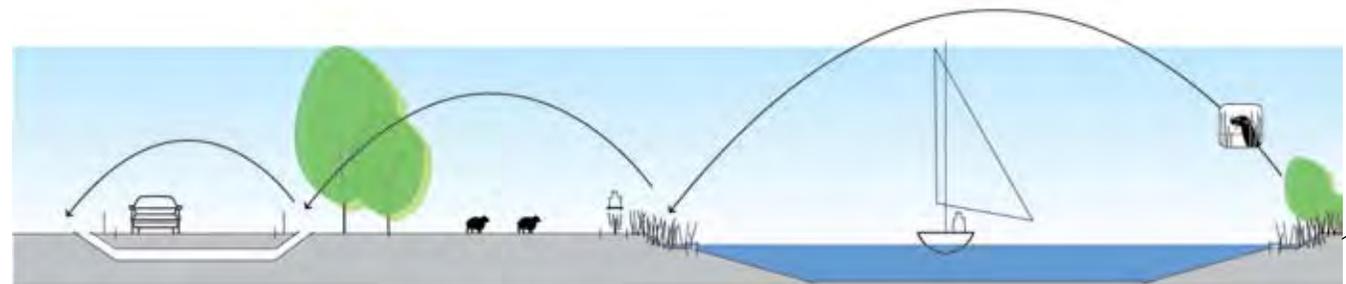
ized in 'ecological' and 'recreational' areas. Recreational parts are ecologically permeable, while ecological parts can be experienced from the other side of a watercourse. Next to the residential area, the marshland strip is open for people. This nature might be used as forage nature. The marshland connects to a former farmyard, which is used for different interactive use of nature like allotment gardens or play grounds. These former farmyards are new public spaces. These areas will be municipal property in this case, while the former farmhouse is occupied by urban people or used for recreational accommodation.

The same principles are applied in the transitional zone of Woerden. The marshland strip is allocated here back from the town border, to save the direct connection with the countryside as a visual experience. Small paths give the opportunity to cross the meadows and enter the marshland strip. By following the 'jaagpad' along the Oude Rijn and crossing a farm yard, the small walk can be completed. Local walking tracks connect to the regional recreational network of cycling paths. Missing links are added to realize a continuing route from the Reeuwijkse plassen to the polder between Woerden and Bodegraven. By a new path along a marshland strip close to Woerden, the polder north of the Oude Rijn is opened up. The path connects to the regional recreational routes here as well.

The detailed design in the area of Woerden shows the alternation of marshland strips and former farmyards. Ecological, recreational and cultural landscape issues come together here. Between farmyards marshland strips will be allocated. New estate areas that are developed on

these spots contribute to the development of marshlands by the purchase price for the house. The restoration of the farmhouses, the construction of new estate buildings, the development of marshland strips and the maintenance of the cultural historical character of farmyards will be sold as one package. New interactive use of nature will be allocated behind the farmhouse to keep the characteristic view from the road.

Ecological connectivity is realized along the Oude Rijn by the construction of shallow banks linked to marshland strips. We mentioned already that fauna passages will be constructed on these spots as well.



The occupation strip is made permeable by 'soft' and shallow reed shores and fauna passages underneath roads.



Paths along backside watercourses create small walks and give a nature experience of the agricultural landscape



New estates financially contribute to the development of marshland strips.

Marshland strips are little wilderness areas between monumental farmsteads

'Soft' shores at left over areas are make it possible of animals to pass the river

The frontyard of monumental farmsteads are characterized by open fields and trees along drive ways

Agricultural fields offer a visual experience of the countryside

Small walks provide in a direct connection with the countryside

Woerden
1:10.000
(legend on page 196)



New estates financially contribute to the development of adjacent marshland strips



Characteristic trees (poplars) along drive ways of farmsteads (near Woerden)



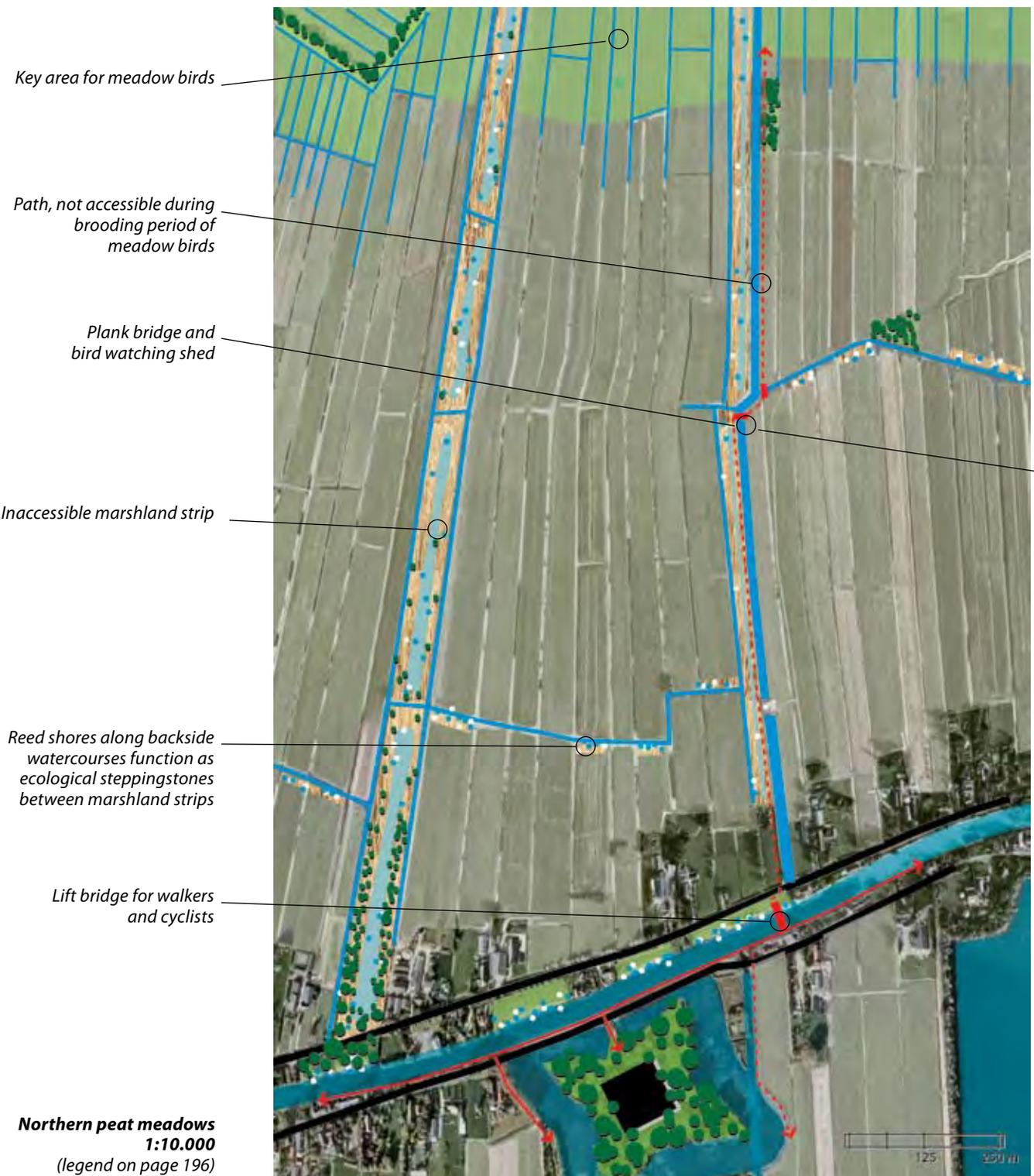
'Soft' shore at left over areas (Den Hoef)

Rural expression of marshland strips

The area north of Wierickerschans is subject to the third detailed design. Contrarily to the zones between town and countryside, this area is more rural. Ecology and extensive recreation determine the design of marshland strips in this area. Important in this area is also the appearance of marshland strips due to the typical openness of the polder. Marshland strips therefore will contain only shrubs close to the occupation strip. This is also necessary to limit negative effects of planting on meadow birds.

The accessibility of marshland strips and the ecological key area north of the map can be regulated by removing planks which connects to sides of a backside watercourse. This might be desirable in the brooding season. In the occupation strip, there are again more possibilities for forage nature than further into the meadow area.

The walking track along the marshland strip north of the river will be connected to the recreational node of Wierickerschans. We propose the construction of a pedestrian bridge, which can be opened for boats. Another advantage of this bridge concerns car traffic to the Wierickerschans. We expect an important part of the visitors of the Wierickerschans will come by car. The regional road north of the Oude Rijn is more suitable for the traffic generated by the recreational node of Wierickerschans, although a transfer node is planned elsewhere.





Bird observation shed. During brooding period, this is the end of the recreational track and the plank bridge is removed. In other periods, people can cross the peat meadows up to Zegveld and Meije



A plank bridge can easily be removed during the brooding period of meadow birds, in order to prevent disturbance (Bovenlanden)



Bird watching shed

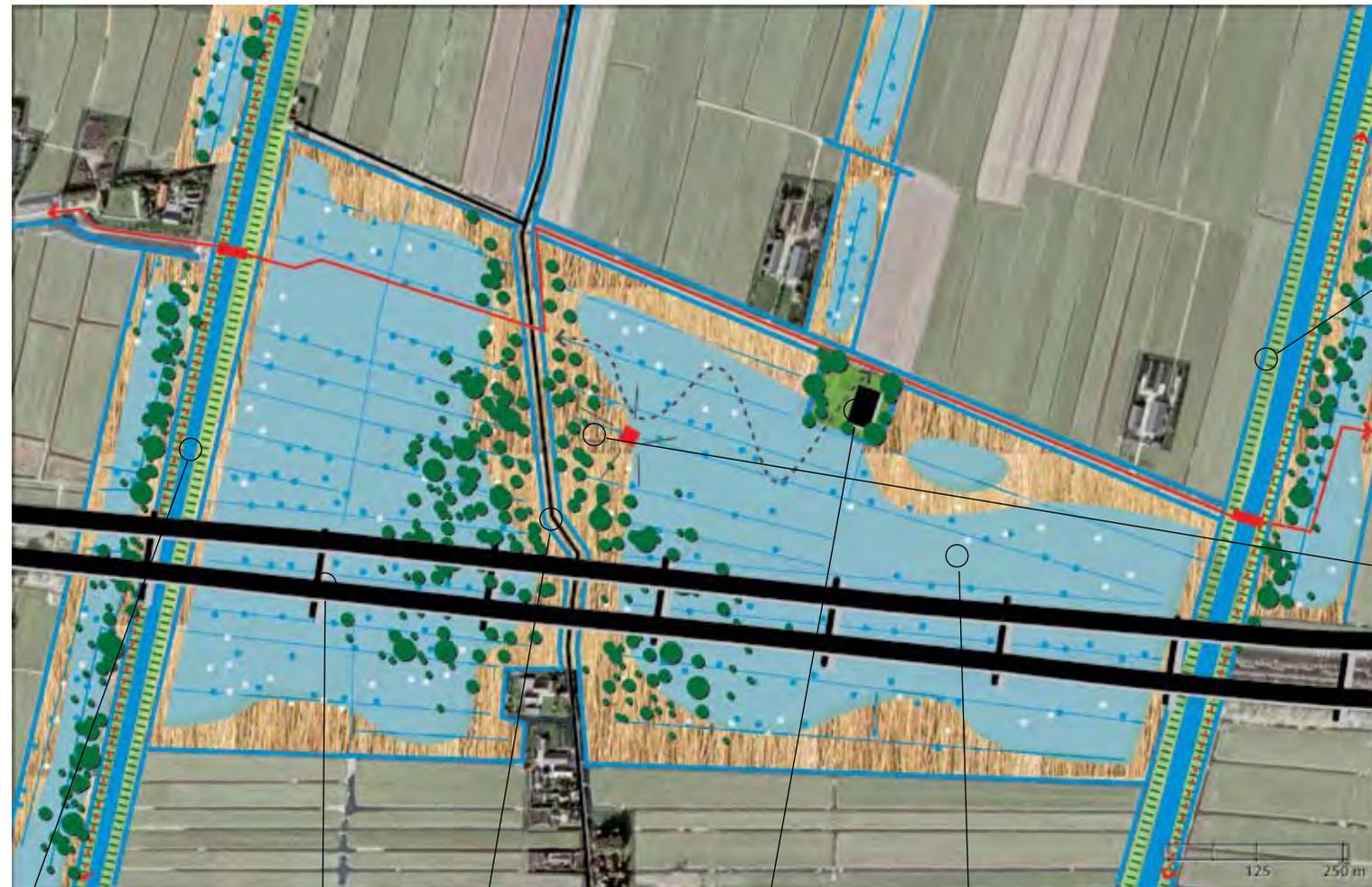


Lift bridge for walkers and cyclists across river Oude Rijn (river Kromme Mijdrecht)

New wilderness in the waterline of defence

The last detailed design focuses on the new wilderness area as part of the waterline of defence. This new wetland is located between the watercourses Enkele Wiericke and Dubbele Wiericke. This is the area that was originally meant to be inundated when hostile troops came close. By inundating this area, we want to make the waterline visible again, but we also want to contribute to the recreational value of the area and make a new ecological key area. For the experience of car drivers on the highway, large things have to be done if we want to show them something. Therefore, the highway is lifted on piles as well, while the wetland continues underneath it.

The local road crossing the areas is camouflaged by reed and shrubs. A watchtower is part of this land strip. An adventure route by a planking path guides the visitor to an information point with catering facility. By connecting to the regional recreational network, the area forms a special attraction for people starting at the fortress of Wierickerschans. Apart from its ecological function, the new wetland also contributes significantly to water storage possibilities.



The borders of the Waterline of Defence are emphasized by planting on one side and a straight shore on the other side

The highway is elevated on piles

A local road is camouflaged

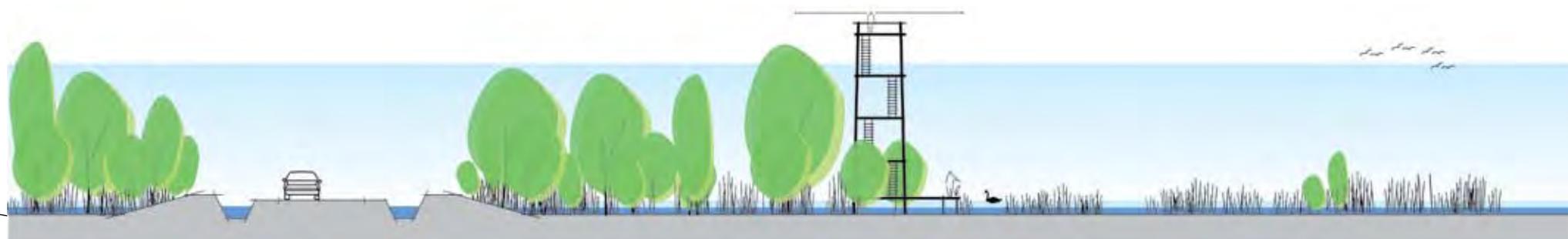
A former farmyard is transformed into an educational farm

open water and marshlands make it possible to experience the impact of inundated land

Waterline of defence
1:10.000
(legend on page 196)



Watercourse Dubbele Wiericke with walking path and marshland strip



Experience from local road and watchtower. The latter offers an overview of the extend Waterline of Defense



Watercourse Dubbele Wiericke is a remnant of the Waterline of Defense



Open water and reed shores



The highway is elevated to make the area ecologically permeable and to increase the experience of the Waterline of Defense

Legend detailed designs 1:10.000



grassland reserve for meadow birds



main watercourse (wiericke)



marshland strip



highway on piles



shrubs



bicycle tunnel underneath highway



orchard / groups of trees on former farmyard



river Oude Rijn with historical 'jaagpad' and regional road



allotment gardens



railway



trees along driveway of monumental farmstead



bicycle track



farmstead



paved path



residential development on former farmyard



little (plank) bridge



backside dike



(semi) paved forage path



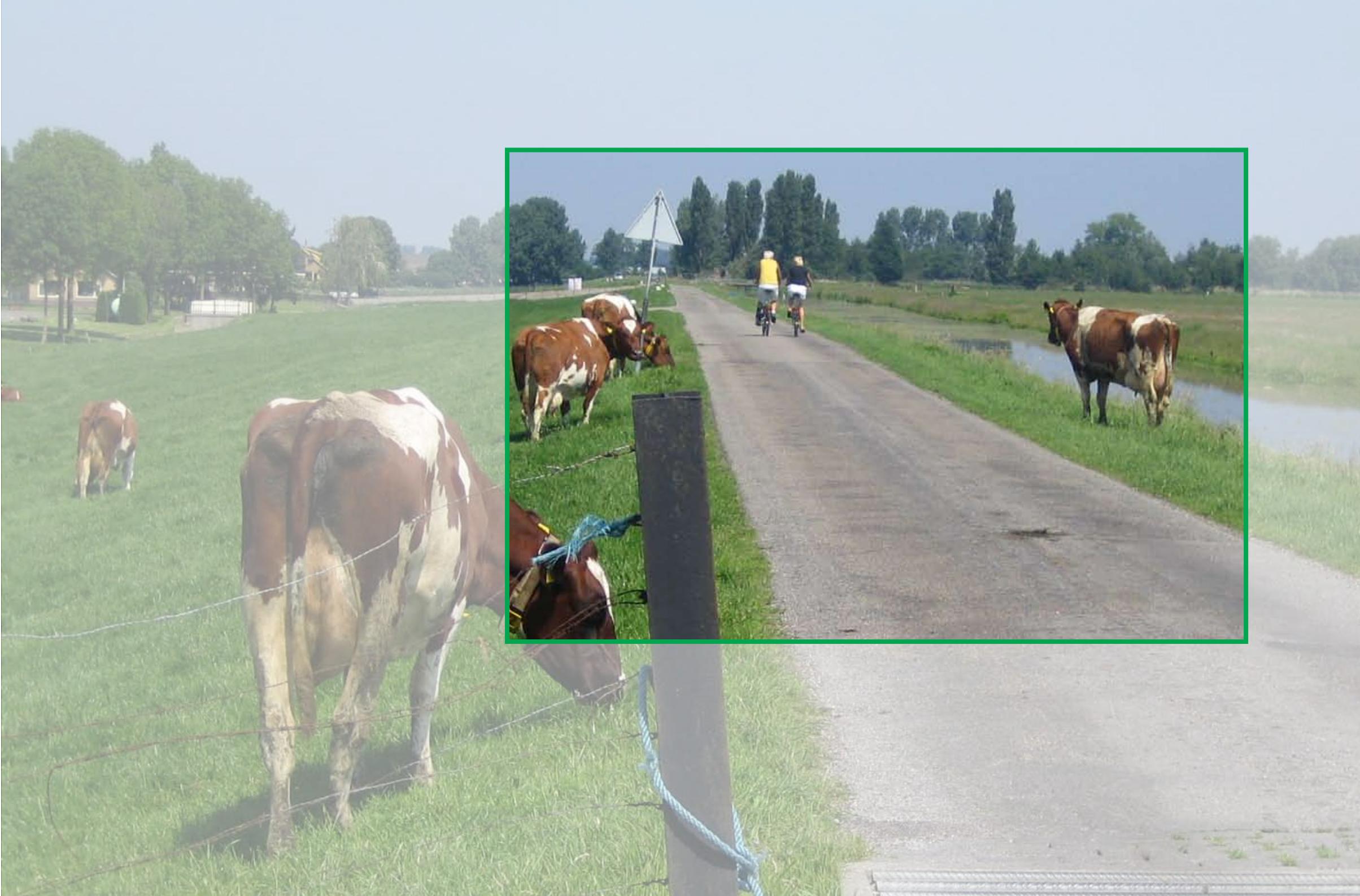
left over areas with shallow reed shore



watching tower



reed strip along backside watercourse



Conclusions

9

back to nature: social benefits

Last years, more social involvement with nature development has resulted in financial investments in nature by governments. As a part of EHS policies and other policy programs, hundreds of hectares have been acquired and transformed into new nature areas.

In our opinion, current policies are not the right answer to social involvement with nature. The meaning of nature in society is broad and multiple, existing of an in essence urban (and romantic) representation of the countryside with nature, (extensive) agriculture, landscape, and cultural history together. The interpretation of this social involvement with nature in policies and spatial concepts is mainly based on an expert representation of nature, which is related to biodiversity.

However, current nature policies are not sufficient to make policies an exponent of social involvement with nature, which is desirable from legitimacy considerations. Biodiversity might be one of the components of nature policies, but it seems not appropriate as main goals. The pillars of policies ideally should correspond with motives on social involvement.

As an exponent of current policies, also current spatial concepts avoid a social interpretation by a separation of nature within the EHS and nature outside the EHS (the white areas). Therefore, different natures come into existence: ecological nature and nature for people. The (cultural) landscape is positioned somewhere in between. The construction of nature for people however, does not solve problems with legitimacy and with social support for nature's biodiversity. Therefore, merging these types of natures is essential.

This final chapter gives an overview of our answers to this issue. The first part deals with the outcomes of this study. We answer the main question of this study and clarify the evidence for the thesis. The second part of the chapter gives an overview of recommendations.

Social benefits

Concerning the social benefits of nature, a local patchwork approach is a better solution than ecological corridors for connecting nature reserves in the peat meadow mosaic. The social benefit of nature in local patchworks is larger due to interaction between different roles of nature. Nature in the local patchwork is not ecological, cultural or recreational, but contributes ideally to all these values.

We demonstrated that the social meaning of nature widely differs and is pluralistic among people. For people nature is generally not ecological, cultural or recreational, but preferably all these meanings together. Moreover, ecological areas, cultural landscapes and recreational areas are not only ecological, cultural or recreational. We also demonstrated that the use of nature by people differs.

Nature planning and policies are now concerned with separating different values of nature in functional areas, whereas a focus on use of nature is more appropriate and socially relevant. How this can work is illustrated by the application of the local patchwork approach in the design case of Oude Rijn.

A local patchwork approach avoids conceptual separation of different values of nature. However, the definite interaction between roles of nature is dependent on local decisions, initiatives, views, willingness, skills and interests. We have good indications that an integrated approach in a regional planning process contributes to interactions between different roles of nature, because of local support, merging of interests and bottom-up methods.

Landscape approach

Current EHS policies are based on a network of key areas (including nature development areas) and corridors. Robust corridors have been added to increase migration possibilities and decrease fragmentation of the network. Extending the network with matrix concepts creates new possibilities to connect nature areas and increasing the surface of nature. A local patchwork approach contributes to landscape and user values of nature. Besides, local patchwork offers a solution for the vulnerability and fragility of corridors in intensively used areas.

A landscape approach anticipates on landscape and localities. However, the local patchwork is no ultimate solution for different contexts. We think creativity is necessary every time again concerning the landscape approach. We developed principles for the peat meadow landscape. The case of Polder Groot-Mijdrecht has shown that different landscapes ask for different solutions.

Spatial claim

Our proposals for a local patchwork contain large spatial claims. We think these spatial claims are relative because of more social benefits. Integration of ecological areas, cultural areas and recreational areas is possible by a larger spatial claim for nature with more social benefits. A large spatial claim should contain nature areas with high joint use. Separation of measures for nature and other land uses in the countryside is not recommended. Exactly a merging of budgets might contribute to financial advantages. A larger spatial claim for nature is therefore also a larger spatial claim for recreation, cultural landscape, water management and extensive agriculture.

Social support

Concerning the social support for nature policies and nature conservation, the tuning of nature policies to social involvement with nature is relevant. Social involvement with nature might decrease if society does not recognize themselves in nature policies. Viewed from a nature conservationist's perspective, this is undesirable because it inevitably causes disappearance of political priority for nature conservation.

Concerning legitimacy and the interests of nature conservationists, the tuning of nature policies to social involvement with nature is important. It asks for broadened nature policies and more comprehensive planning and design concepts for nature. More good examples of broadened nature policies emerge. For example, the National Spatial Strategy (Ministerie van Volkshuisvesting, 2004) implicitly stands for a broad definition of nature. Also the nature strategy by the province of Utrecht (Gedeputeerde Staten van Utrecht, 2007) more explicitly mentions a multiple view on nature.

A local patchwork approach for the peat meadow mosaic contributes to the legitimacy of nature policies and the support for nature conservation in future times.

9.2 Recommendations

Preferred use of the local patchwork approach

Like the local patchwork approach, previous spatial concepts for nature have always been developed in specific cases. Many of these concepts have been generalized in order to copy them to different contexts. Sometimes this resulted in successful applications, more often this resulted in forced solutions for distinct problems. We would like to emphasize the contextual character of the local patchwork approach. The patchwork is a concept for the peat meadow landscape in a metropolitan area. Elements might be valuable for different other landscapes too, but have not been developed for these contexts. Ideas should therefore be applied carefully.

Definition of nature

The definition of nature has to be broadened to acknowledge all natural values of landscape. Not only the areas zoned by governments in spatial plans contain nature; different appearances and qualities of nature are available in areas with different functions and usage. This fact is ignored by conceptions which represent space as an alternation of ecological and non-ecological areas. A relative representation of nature makes more sense. This relative existence of nature ideally should be admitted by policies and spatial concepts.

Further research

We studied spatial possibilities for a broadened approach of nature development. However, the final design asks for much technical expertise. To understand the detailed consequences of our approach in terms of

ecology, finances, and hydrology, specific investigations have to be done. Ecological research is needed to know the contribution to connectivity of different elements of the patchwork. To prove our conceptual principle of 'a larger spatial claim with more social benefits', in specific cases detailed financial investigation is necessary. Finally, we proposed creative solutions for water storage and new wetlands for multiple purposes. The question how this can be realized with water management still needs to be answered.

Contribution to an interdisciplinary tradition

This research is a landscape study. From different perspectives we looked at the same study object: landscape. In our opinion this is characteristic for cooperation of landscape architects and spatial planners. Landscape architects look from an artistic perspective to landscape, spatial planners focus on policy issues concerning landscape. But landscape as a combination of aesthetics, processes and organization as directing forces is their common business.

Next to an exploration of our own scientific tradition, we intended to contribute to a broader scientific tradition of (landscape) ecologists, geographers, cultural historians, social scientists, planners and (landscape) architects. Those different disciplines together with a transdisciplinary approach are necessary to deal with the issue of nature. Nature is the domain of people, while technical, social and artistic knowledge is needed to save and develop natural values. The expertise of solely single disciplines might threaten these values.





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P. 149 Animations with Broadway Boogy Woogie

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P. 173 Marshland

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P. 189 Allotment gardens

FLICKR.COM (2007) *http://flickr.com/photos/14684343@N00/52477088/*; visited on 26th of november 2007

P. 189 Planking paths

OOMEN, D. private photo

P. 189 (Semi) public orchard

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P. 191 New estate

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Interviews

Interviewee	Organization	Date and place
Ir. J. Bok Coordinator Robust ecological corridors	Provincie Utrecht Landelijk Gebied Ontwikkeling	March 21, 2007 Provincial office Utrecht, Utrecht
Prof.ir. K. Kerkstra Emeritus professor Landscape Architecture	WUR - Centre Landscape	April 18, 2007 De Hucht, Wageningen
Dr. E.G. Steingröver Researcher ecological networks	WUR - Centre Landscape	May 2, 2007 Gaia, Wageningen
Ing. J. Wattel Consultant Agricultural Engineering	Arcadis	May 23, 2007 Office Arcadis, Rotterdam
Drs. A. Hunia Project Leader Nature Development	Dienst Landelijk Gebied Regio West	June 14, 2007 Office Dienst Landelijk Gebied, Utrecht
Ir. R. Beunen Assistant Professor Land Use Planning	WUR - Centre Landscape	September 20, 2007 Gaia, Wageningen
J.M. Govers Project Leader 'Window Area' Woerden- Bodegraven	Provincie Zuid-Holland Bureau Projecten Ruimtelijke Ordering	October 16, 2007 Provincial office Zuid-Holland, 's Gravenhage

Ecosystem targets

Grassland with small water (B1)		Ambition level target species
Poor, wet grassland	<ul style="list-style-type: none"> > quaking peats (3.27) > peat moss reedlands (3.28) > poor, wet grasslands (3.29) > marsh marigold grasslands of brook valleys (3.30) > marsh marigold grasslands of peat and clay (3.31) 	High – Low: <ul style="list-style-type: none"> > Amur bitterling (2) > Great crested newt (2) > Spined loach (1) > European frog (4)
Botanical grassland	<ul style="list-style-type: none"> > dry, poor grassland of higher grounds (3.33) > flowery grasslands of sand and peat areas (3.38) > flowery grasslands of clay areas (3.39) 	
Other: grassland	<ul style="list-style-type: none"> > wet, moderate fertile grasslands (3.32) 	
Other: water	<ul style="list-style-type: none"> > buffered pool (3.14) 	

Swampland and shrubs with large water (H)		Ambition level target species
Other: marsh (salt marsh)	<ul style="list-style-type: none"> > marsh (3.24) > wet humus herbage (3.25) 	Low: <ul style="list-style-type: none"> > Great reed warbler (2) > Beaver (1) > Otter (1) > Great bittern (1) Medium: <ul style="list-style-type: none"> > Bluethroat (2) > Large copper (1) > Tundra vole (1) > Sedge warbler (1) > Grass snake (1) High: <ul style="list-style-type: none"> > Amur bitterling (1) > Catfish (1) > Queen of spain fritillary (2) > Moderlieschen (4) > Eurasian water shrew (2)
Other: shrubs	<ul style="list-style-type: none"> > willow shrubs (3.55) 	
Other: water	<ul style="list-style-type: none"> > canals and main water courses (3.19) > peat hole (3.17) 	

Ecosysteemtypen

Grasland met klein water (B1)		Ambitieniveau doelsoorten
Natte schraalgraslanden	<ul style="list-style-type: none"> > trilveen (3.27) > veenmosrietland (3.28) > nat schraalgrasland (3.29) > dotterbloemgrasland van beekdalen (3.30) > dotterbloemgrasland van veen en klei (3.31) 	Hoog – laag: <ul style="list-style-type: none"> > Bittervoorn (2) > Kamsalamander (2) > Kleine modderkruiper (1) > Poelkikker (4)
Botanisch grasland	<ul style="list-style-type: none"> > droog schraalgrasland van de hogere gronden (3.33) > bloemrijk grasland van het zand- en veengebied (3.38) > bloemrijk grasland van het kleigebied (3.39) 	
Overig: grasland	<ul style="list-style-type: none"> > nat, matig voedselrijk grasland (3.32) 	
Overig: water	<ul style="list-style-type: none"> > gebufferde poel (3.14) 	

Moeras, struweel en groot water (H)		Ambitieniveau doelsoorten
Overig: moeras en (kwelder)	<ul style="list-style-type: none"> > moeras (3.24) > natte strooiselruigte (3.25) 	Laag: <ul style="list-style-type: none"> > Grote karekiet (2) > Bever (1) > Otter (1) > Roerdomp (1) Middel: <ul style="list-style-type: none"> > Blauwborst (2) > Grote vuurvliinder (1) > Noordse woelmuis (1) > Rietzanger (1) > Ringslang (1) Hoog: <ul style="list-style-type: none"> > Kleine modderkruiper (1) > Meerval (1) > Purperstrepparelmoervliinder (2) > Vetje (4) > Waterspitsmuis (2)
Overig: struweel	<ul style="list-style-type: none"> > wilgenstruweel (3.55) 	
Overig: water	<ul style="list-style-type: none"> > kanaal, vaart en boezemwater (3.19) > petgat (3.17) 	

Colofon

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