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AND NATURAL HABITATS

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**LÜNEBURG HEATH NATURE RESERVE
(GERMANY)**

**Appraisal report
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*Document prepared by
the Directorate of Democratic Governance, Culture and Diversity*

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The European Diploma for Protected Areas (category B) was awarded to the Lüneburg Heath Nature Reserve in 1967 and has been renewed regularly since then, last time in 2002.

The expert was not accompanied by any members of the secretariat on his visit to the park.

Resolution CM/ResDip (2007) 6 on the renewal of the European Diploma of Protected Areas awarded to the Lüneburg Heath Nature Reserve (Germany) was adopted by the Committee of Ministers on 24 October 2007 at the 1009th meeting of the Ministers' Deputies. The Resolution appears in Appendix I.

1. INTRODUCTION

1.1 GENERAL

The Lüneburger Heide Nature Reserve (Naturschutzpark Lüneburger Heide NLH) was established in 1922. It is exceptional, as the responsible Verein Naturschutzpark e.V. (VNP) with its Stiftung (Trust) is a private organisation with 3079 members in January 2011.

The NLH comprises a large coherent area of appr. 23'400 ha., roughly between Schneverdingen and the brooks Seewe and Schmale Aue, including the former British tank training grounds near Schneverdingen (the so-called Red Zones). The whole area comprises about 14,800 ha of forest, 5'100 ha of heathland, almost 3'400 ha of agricultural land, 450 ha of peatland, a length of appr. 70 km brooks, more than 100 stagnant waters, and 300 ha (1.5%) "urban area", that is small hamlets. The forest within the NLH is one of the largest "Waldnaturschutzgebiete" (forest protection area) of Germany.

The property and the leased areas of the VNP within the NLH are about 8'400 ha. The Heathland-area is owned or leased by the VNP on 98% of all heathland. About 17% of the total forest-area, 85% of the peatland and 15% of the agricultural surface is owned by the VNP.

The importance of the NLH for nature-protection and biodiversity can be estimated even higher than a national park, while the land owned by the VNP is nature reserve in the traditional strict sense.

Tab 1: Ownership in the NLH

Owners	1997	2001	2011
Verein Naturschutzpark e.V. VNP *	7.000 ha	7.200 ha	7.900 ha
The land of Lower Saxony (federal country)	5.000 ha	5.000 ha	5.000 ha
Klosterkammer Hannover (convent)	3.000 ha	3.000 ha	3.000 ha
Private ownership	8.000 ha	7.800 ha	7.100 ha
Total area	23.400 ha	23.400 ha	23.400 ha

* excl. leased areas

The competent authority of the nature reserve are the two regional authorities Landkreis Harburg and Landkreis Soltau-Fallingsb. 2005 the Land Niedersachsen has handed over the competence to the two Landkreise. The management lies in the hands of the private organisation „Verein Naturschutzpark e.V. (VNP)“ with its Stiftung (Trust) Naturschutzpark Lüneburg Heath (see § 3.1. table 5).

1.2 EUROPEAN DIPLOMA

In 1967 the Lüneburger Heide Nature Reserve was awarded the European Diploma for the Conservation of Nature, category B¹. The Diploma was subsequently renewed every five years, the last time in 2002. The objective of an appraisal is to describe the state and development of the reserve since the previous renewal of the Diploma. This should taken into account the recommendations attached to the renewal of the Diploma in 2002, and recommend, if possible and necessary,

¹ See also Council of Europe, European Nature Conservation Diploma Series No. 4. Lüneburger Heath. Strasbourg, 1968.

measurements for the coming period; for the recommendations attached to the renewal of the Diploma in 2002, § 3.13. By a draft resolution, drawn up by the secretariat with a view to extending the validity of the Diploma for a further five-year period (2007 – 2012 appendix II) there were attached recommendations to the renewal. These recommendations were under special observance during the on-the-spot appraisal in Septembre 2011.

1.3 PRESENT ON-THE-SPOT APPRAISAL

In view of the renewal of the diploma in 2012, I was invited by the General Secretariat of the Council to carry out a new on-the-spot appraisal in Septembre 2011. Following an introductory meeting in the morning of Septembre 14 with the enlarged Steering Group Lüneburger Heide ("Steuerungsgruppe für das Naturschutzgebiet Lüneburger Heide", plus additional representatives of e.g. tourism associations and the Wasserwerke Hamburg), I visited the Diploma area Naturschutzpark Lüneburger Heide (NLH) in the afternoon and the following day, guided by the head of the management board and the responsible heads of departments of the NLH. A press-conference followed in the late afternoon. In the evening of septembre 15 there was a meeting with representatives of the regional government (Bezirksregierung Lüneburg) and of the councils of the municipalities concerned (Landkreis Harburg and Landkreis Soltau-Fallingb. c.s.). I was not accompanied by a representative of the Secretariat.

2 EUROPEAN INTEREST

2.1 GENERAL

The general objective of the Lüneburger Heide Nature Reserve is: Protection and development of an extensive part of the landscape of the central Lüneburger Heide with its historical formed heathland landscape and adjacent forests². This is worked out in the following text.

The European interest of the Nature Reserve, as summarized in the Information sheet for European Diploma Holding Areas DE940003, can be confirmed. The Naturschutzpark Lüneburger Heide (NLH) is not only a very important protection area for flora and fauna species and special types of landscapes, it is also an area of maintaining and protecting a cultivation of heathland, which is some thousand years old. This aspect of maintaining cultivation makes the NLH also to a European hotspot of biodiversity, which includes human cultivation besides protection of species, biotopes, genetics and landscapes.

A comprehensive and detailed survey of the history, ecology and nature conservation and management of the NLH was published (Cordes, 1997) followed by a study of the avifauna of the NLH (Lütkepohl, 2000). A new study about the effects of all kinds of land use was recently published (Keienburg, 2006). The dynamics between wetland flora and groundwater extraction is shown by a new publication (Klötzli, 2004). A large bibliography can be found on the homepage of the NLH on the themes concerned. www.verein-naturschutzpark.de. The literature mentioned in this paper is listed in appendix II.

2.2 FLORA AND FAUNA

The main and characteristic semi-natural ecosystems in the NLH are dry and wet heathlands, peatlands, oligotrophic grasslands, forests, brooks and brook valleys. The NLH is one of the very few areas in the northwest European lowland where peatland, i.e. living raised bog and "spring bogs" still continue to thrive. Following the extensive inventories done for the book published by Cordes 1997, the flora and fauna are monitored as indicated in the following table:

Tab. 2: Flora and Fauna monitoring methods

Monitoring		
	Method	Scale

² Verordnung der Bezirksregierung Lüneburg über das Naturschutzgebiet 'Lüneburger Heide' in den Landkreisen Harburg und Soltau-Fallingb. von 17. Juni 1993, § 3 Schutzzweck

Flora	Study of permanent squares	Local site
Fauna: invertebrates*	Study of permanent squares	Local site
Fauna: vertebrates	Overall census	Landscape type

* *Carabidae*, *Arachnidae*

As a whole, the flora and fauna in the NLH is proved to be more or less stable. At least 700 species of higher plants (phanerogams and ferns) are recorded to occur in the NLH. Of these, 140 are on the Red List of the Land Niedersachsen. As regards mosses, the number of characteristic and rare species is over 120, of which 64 species are on the Red List for the lowland in Niedersachsen.

The still incomplete list of native mammal fauna counts 35 species, including e.g. 8 species of bats. The inventories of mammals, especially bats is incomplete and will be expanded in the coming years. Of the bird species regularly breeding in the NLH, 28 are on the Red List of the Federal Republic and 27 on the Red List of Lower Saxony. In Lütkepohl, M. & J. Prüter 2000 (Appendix II) all bird species and their status is described in detail. This includes species such as White Stork (*Ciconia ciconia*), Black Stork (*Ciconia niger*), Crane (*Grus grus*), Montagu's Harrier (*Circus pygargus*), Quail (*Coturnix coturnix*), Curlew (*Numenius arquata*), Nightjar (*Caprimulgus europaeus*), Wood Lark (*Lullula arborea*), Great Gray Shrike (*Lanius exubitor*). As regards the Black Grouse (*Tetrao tetrix*), the population has increased since the last on-the-spot appraisal and seems now to be stable. However, it should be noted that the real distribution and the success of reproduction is not definitely known. A project to study the situation of Black Grouse in the NLH was launched in 2005. (Wübbenhorst, J. & Prüter, J. 2007). The NLH-management plans to continue the monitoring of the population in detail.

The Annual Reports 2009 and 2010 of the Lüneburg Heath describe the following developments of bird-key-species: *The population of the black grouse (Tetrao tetrix), the key species of large calluna heath lands, is now more or less stable with a slight negative trend concerning individuals (total) in 2009 and 2010. The number of male grouse is stable over the years whereas the number of females is volatile. Due to the excellent camouflage of the female birds the surveillance and data collection is difficult. The following table shows the population development during the last years.*

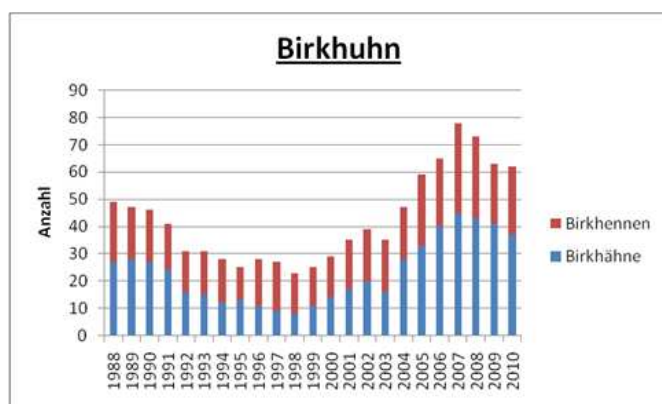


Diagram 1: Development Black Grouse population in the Heathland

The population of Crane (Grus grus) suffered due to the dry spring. Cranes build their nests on small islands in wetlands, where eggs and nestlings are protected against predators, particular wild boars. This year, a lot of wetlands fell dry very early in breeding season and nestlings were unprotected.

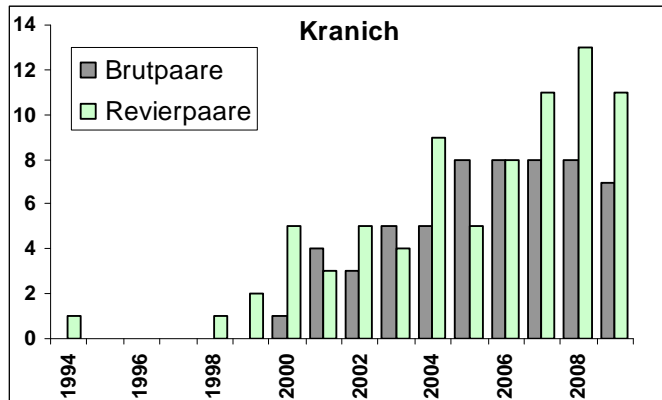


Diagram 2: Development of breeding Cranes (Green=breeding couples, grey = other couples)

In January 2009 the middle-spotted woodpecker (*Dendrocopos medius*), a highly endangered bird species, was spotted in Wilsede, a small village in the centre of the nature reserve, for the first time. During winter and spring the bird showed nesting behavior. This woodpecker depends on old trees (oaks, beeches) with deep bark and an abundance of insects.

A hoopoe (*Upupa epops*) was noticed during mid April and beginning of June. The hoopoe is an extremely rare bird in Germany. After frequent observations in 2005, 2008 and 2009 special nesting boxes are now installed to encourage reproduction in Lüneburger Heide.

Table 3: Rare and ecological valuable breeding bird species of Lüneburger Heide NSG

Latin Name	German / English Name	Red data book of Lower Saxony, category	Development
<i>Ciconia nigra</i>	Schwarzstorch, „black“ storck	2, highly endangered	
<i>Numenius arquata</i>	Großer Brachvogel, curlew	2, highly endangered	no change, 3 breeding territories
<i>Gallinago gallinago</i>	Bekassine, common snipe	2, highly endangered	
<i>Aegolius funereus</i>	Raufußkauz, owl	FFH-Annex I specie	
<i>Glaucidium passerinum</i>	Sperlingskauz, „sparrow“ owl	FFH-Annex I specie	
<i>Lanius excubitor</i>	Raubwürger	1, threatened by extinction	
<i>Jynx torquilla</i>	Wendehals, wryneck	1, threatened by extinction	
<i>Dendrocopos medius</i>	Mittelspecht	FFH-Annex I specie	1 territories
<i>Saxicola rubetra</i>	Braunkehlchen, whinchat	2, highly endangered	4 breeding territories

<i>Oenanthe oenanthe</i>	Steinschmätzer, wheatear	1, threatened by extinction	
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Tab. 4: New rare and ecological valuable breeding birds, of Nature Reserve Lüneburger Heide NLH

Latin Name	German / English Name	Red data book of Lower Saxony, category	Numbers
<i>Luscinia svecica</i>	Blaukehlchen, Bluethroat		1 breeding territory (Holmer Teiche)
<i>Rallus aquaticus</i>	Wasserralle, Water rail	3	1 breeding territory (Holmer Teiche)
<i>Circus aeruginosus</i>	Rohrweihe, Western Marsh harrier	3	1 breeding territory (Holmer Teiche)
<i>Acrocephalus scirpaceus</i>	Teichrohrsänger	V, might be endangered in future	29 breeding territories (Holmer Teiche)

The herpetofauna counts 6 species of reptiles, including e.g. sand lizard (*Lacerta agilis*) and viper (*Vipera borus*), and 12 species of amphibians. The ichthyofauna of running waters amounts to 13 species. The fauna of invertebrates is rich in species and counts many species of the Red List of Lower Saxony. For instance, the NLH harbours 41 species of dragonflies and 313 of spiders. Among the latter group, 51 species are on the federal Red List and another 78 of the red Lists of federal countries.

Grasshopper species

Several grasshopper species were discovered for the first time in Lüneburger Heide nature reserve (e.g. *Pholidoptera griseoaptera*, *Phaneroptera falcata*, *Oedipoda caerulea*) in the last years. Experts are not sure whether this phenomenon is caused by global climate change or changing of habitat structures within the reserve.

A program for the conservation of grasshopper species *Gampsocleis glabra* was carried out in 2009 and 2010. This grasshopper was once a typical species of heath lands but is now threatened by extinction with only two populations left in Germany. Male and female specimens were caught on military training grounds in the neighbourhood of the reserve and translocated to receptor sites within the reserve. The conservation program is combined with zoological surveys to monitor the new habitats of *Gampsocleis*.

Another conservation program was carried out to enlarge the habitats of cricket species *Gryllus campestris*. This species is an indicator for dry grass and heath land. The loss of grasslands used with low intensity led to a decline of the population of this cricket species which is now endangered in Germany (Red data book, category 3).

Beetles

In 2009 and 2010 the “Stag beetle” *Lucanus cervus* was discovered for the first time in several oak woods in the central part of the reserve. The Stag beetle is registered in the second Annex of EC Fauna-Flora-Habitat Directive and the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention of 1982). It is highly endangered and listed in Category 2 of German Red Data Book.

Dragonflies

Further positive developments were noticed for two endangered Dragonfly-species (*Orthetrum brunneum* and *Leucorrhinia albifrons*). Both species are threatened by habitat loss. The population of *Leucorrhinia* is nearly extinct in Western Europe (Category 1 of German Red Data Book). It is therefore listed in Annex IV of EC-Habitat directive and also protected by German conservation law.

Amphibians

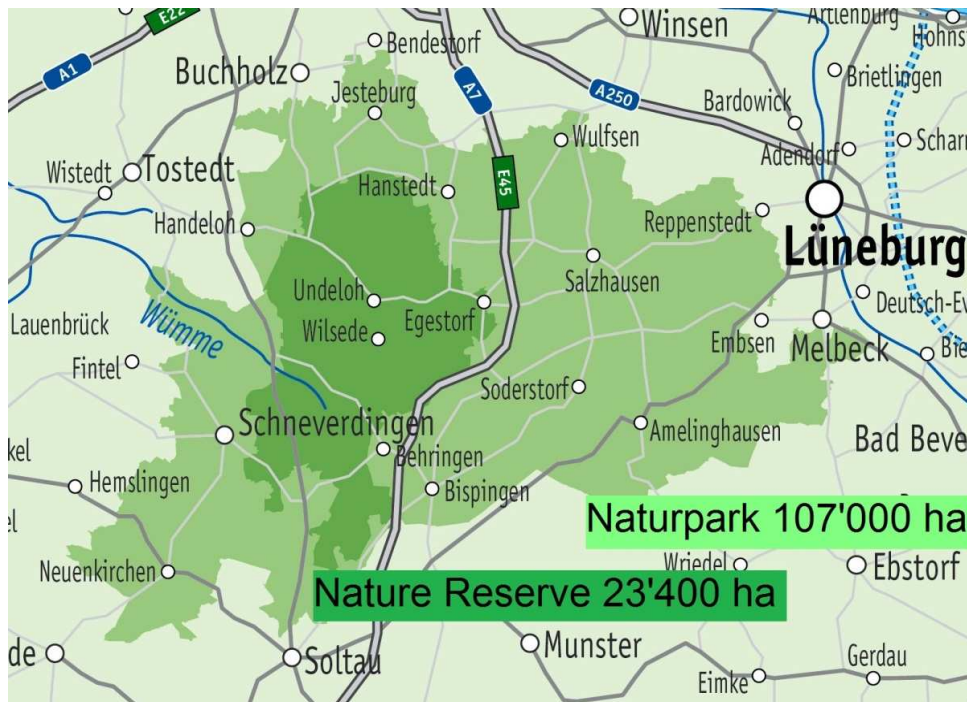
The fishing ponds of “Holmer Teiche”, leased 2010 by VNP (see § 4.2) provide best conditions for an abundance of amphibian species. Adult animals and spawn were found of “Garlic toad” or Common Spadefoot (*Pelobates fuscus*), as well as Moor Frog (*Rana arvalis*). Both amphibian species are endangered in Germany and are protected by German conservation law. They are also included in Annex IV of EC Fauna-Flora-Habitat directive. Holmer Teiche also provide good living conditions for the largest of the German newt species the Great crested newt (*Triturus cristatus*).

The research on species and habitats has increased in a large scale since the last renewal-report and may be a sign of the high level of professionalism of the management in the NLH.

3 MERITS AND PROTECTION SYSTEM

3.1 GENERAL

The body responsible for the Lüneburger Heide Nature Reserve is the Verein Naturschutzpark e.V. with its public trust “Stiftung Naturschutzpark Lüneburger Heide”. It is a private organisation. This exceptional status of the Nature Reserve requires special legal provisions for planning, management and public financial support. Federal funding is not given in the same amount as for other Nature Reserves like National Parks. Although the Lüneburger Heide Nature Reserve has at least the value of a National Park. This lack of federal funding causes some problems (see § 3.2 sub b).



Map 1: The strictly protected area of the Nature Reserve is surrounded by the Nature Park, established 2007, making a kind of protected buffer zone.

Private initiatives started already in 1906, when the “heath pastor” Wilhelm Bode bought the area of “Totengrund” for nature conservation with financial support from Prof. Andreas Thomsen. In 1907, these two and the teacher Bernhard Dageförde established the Heathland Museum in Wilsede. The Verein Naturschutzpark e.V. (Nature Parks Association), established in 1909 in München, became engaged when it bought the Wilseder Berg in 1910. Finally, the Lüneburger Heide Nature Reserve was established in 1922.

Tab. 5: A survey of general data of the NLH.

Administration and management of the Lüneburger Heide Nature Reserve	
Body responsible	Verein Naturschutzpark e.V. (VNP), est. 1909. 2002 a public trust called “Stiftung Naturschutzpark Lüneburger Heide” was founded as a part of the “Verein Naturschutzpark” to administrate the Nature Reserve.
Supervision	Regional authority of the local governments (Landkreis Harburg, Landkreis Soltau-Fallingb.ostel).
Advisory Board	Steering group Lüneburger Heide*. This "Steuerungsgruppe für das Naturschutzgebiet Lüneburger Heide" has a platform function, it is not a regular advisory committee. In addition, there is a larger team**. For actual problems, ad hoc advisory groups of specialists and otherwise involved parties are formed. 2007 founding of the enlarged “Naturpark Lüneburger Heide”, i.e. the region surrounding and including the Nature Reserve on totally 107'000 hectares (Map 1). A “Naturpark” is a protected area of outstanding natural beauty and good recreational quality whereas a Nature Reserve is a protected area of very high ecological value.
Attributions and powers	The VNP and his trust has a central role in the planning and management of the NLH and is responsible for the planning and management of its properties in the NLH. The management of the VNP/Trust is divided in sectors called “Fachbereiche” of wich everyone has a head, a managing director on high education level.
Protection system	The amendment of the 1921 statute for the NLH came into force in 1990. New regulations providing the necessary legal provisions were published in 1993 (i.e. the " <i>Verordnung der Bezirksregierung Lüneburg über das Naturschutzgebiet "Lüneburger Heide" in den Landkreisen Harburg and Soltau-Fallingb.ostel</i> "). These regulations also specify the boundaries of the nature reserve, and provide a framework for implementation of the management and development plan.
Budget and financial sources	The annual budget in 2011 is 3,7 million EURO. It is supplied by the members of the VNP and - largely - by the federal state of Lower Saxony.
Human resources	The VNP has a limited full-time staff of thirteen employees, mostly engaged in public tasks, planning and management, which is supported by fourteen part-timers and seventeen volunteers leading excursions and the like. Three persons are in training/education in 2011.
Scientific co-operation	Alfred Toepfer Akademie für Naturschutz (formerly the Norddeutsche Naturschutzakademie) in Schneverdingen.

* Bezirksregierung Lüneburg, Verein Naturschutzpark, Niedersächsische Forstamt Sellhorn, Alfred Toepfer Akademie für Naturschutz (NNA), Landkreis Harburg and Landkreis Soltau-Fallingb.ostel.

** I.c. the "Steuerungsgruppe", plus Niedersächsische Landesamt für Ökologie, private forests, Niedersächsische Landvolk and nature protection organizations and tourism associations.

The foundation of a public trust in 2002 was a helpfull addition to the organisation “Verein Naturschutzpark”. The ojectives to manage and protect the Nature Reserve have been adopted completely by the trust. The function and the goals of the trust are the maintenance of the Heath, the landscape maintenance farm “Landschaftspflegehof Tütsberg”, the other buildings, the ecology of forests and nature protection activities. The mission of a foundation (trust) can legally not be modified as it is possible for a registered society “Verein e.V.”. By founding a trust, the protection-goals have been assured in the long term.

The funds obtained from the project "Establishing and safeguarding Natural Sites and Landscapes deemed worthy of protection and of representational importance nation-wide" (part of the Federal

Promotion Programme) amount to 26,9 million DM for the period 1991 – 2002 do not exist any more. This lack of funding is additionally aggravated because the NLH is until now not accepted as a National Park with its higher funding, although it has an even higher protection status (see 3.2 sub b).

3.2 EFFECTIVENESS OF EXISTING PROTECTIVE REGULATIONS

A. INTERNAL THREATS

- *Expansion of purple moor grass*

The expansion of purple moor grass (*Deschampsia [Avenella] flexuosa*), taking over the dominance in dry Calluna heathlands is effectively combated by various management measures (sod cutting, chopping, grazing). In addition, juniper (*Juniperus communis*) is locally growing so densely that it replaces the heather and has to be thinned. In practise, the main problem is the threat of insufficient financial resources (see sub b).

- *Funding of management in the Red Zones*

Since the last renewal of the European Diploma, the VNP bought the Red Zone areas owned by the federal government. 100% of the former british tank manoeuvres area is now in possession of the VNP. Most of this land was sandy soil with destroyed vegetation. The restauration with heath-flora is going on successfully. Pioneertree-species are growing also very successfully. They have to be teared out by hand or machines to save heathflora, what is very expensive and stresses the NLH-budget. Funding of the NLH by the Federal Republic comparable with the funding of National Parks could solve the Problem.

- *The isolation of the biotopes*

The connection between the heathlands inside the NLH is sufficient, both from an ecological point of view as well as regards the scenery. The main exception is the interruption between the large heathlands east and west of Wilsede. The scenic importance of creating a wide corridor here is stressed by the concentration of visitors at Wilsede due to the presence of the Heathland museum *Dat ole Huus*. Wilsede is a visitors hotspot in the center of the Nature Reserve. A certain traffic infrastructure is necessary. The ongoing ecological enhancement of the forest around Wilsede is one possibility to create the corridor. A lot of work has been done since the last Diploma renewal in 2002. The monitoring of this problem should be kept on the agenda.

- *State of brooks and associated wet valley biotopes*

The discontinuous and denaturated state of brooks and associated wet valley biotopes (wet brook valley grassland) should still be noticed. Local restoration of these biotopes is in good progress since 2002 (Schmaler Aue, Sprengbach). A big part of the land around the brooks was bought by the VNP. The influence of fertilisers was reduced on these areas. On other private areas the negative impact of fertilizers increased (Haverbecke, Wehlener Moorbach and Schmale Aue) because of grassland plowed and cultivated with Mais. The area cultivated with intensively fertilised maize is encreasing. Inside the Nature Reserve private farmers keep about 85 hectares of maize (Deimern, Oberhaverbeck, Wehlen/Wesel). The ecological relevance of funding maize inside Nature Reserves should be checked by the government and should be set in relation to the funding of extensive ways of agriculture as well as cultivating and maintaining the heathland by sheep. Another problem exists at the Radebach, where residual water from the roads flows into the brook (with dung from carriage horses). Densely planted spruce will be eliminated on 2 kilometers border along the Radebach in 2011. A restoration of the brook will follow. Other restoration plans are still difficult because of bordering private land. The headwater of the Wümme is in a very close-to-nature status. Along its course through the forest it is channelled and needs restoration. Sprengbach will be completely restored in 2012. Summing up we can say, that today the ecological situation of all brooks is still not optimal. During the last twenty years a big effort has been made and a lot of success has already been achieved. A big effort must still be done to restore brooks inside the Nature Reserve and to reduce the impact ob brooks flowing into the Reserve from outside.

- *The question of water extraction by farmers*

An additional lowering of the groundwater-level has been noticed in the last few years. This concerns the extraction of groundwater for irrigation by farmers. The water for irrigation is taken underground near the surface of the soil, what makes a stronger affect as the deep extraction by the Wasserwerke Hamburg (50 – 200 meters deep). The extraction for irrigation happens mostly during dry periods, when there is already a low water level by natural causes. Plans exist actually to extend the stations for irrigation. The longtime vegetation-monitoring (Klötzli, F. 2004, Appendix II) describes the effects of water extraction near the surface as vulnerable for several vegetation types. A coordination and possible compensation of all water extraction with the activities of the Wasserwerke Hamburg is necessary, also outside of the NLH. Analyses of possible conflicts have to be made before extending any water extraction. An association of the farmers irrigating their land has been founded quite recently. A partnership with the Wasserwerke Hamburg should be aimed at.

- *The cultivation of energy-crops*

The area under cultivation of energy-crops, particularly maize, was enlarged in 2010. Maize cultivation expanded into the core habitats of the reserve. Maize was cultivated right next to heather vegetation and in the spring and upper regions of heath land brooks. The massive expansion of maize and other energy crops like millet have an adverse affect on the scenic qualities of the reserve and might also have negative influence on ground breeding birds like black grouse and on the water quality of heath land brooks. The cultivation of maize also leads to a massive increase of field irrigation. This might affect the local ground water table (see 3.2 sub b). The planning authority of Landkreis Soltau-Fallingb. already allowed field irrigation for maize fields' right in the centre of the reserve.

- *The lack of professional Nature Wardens*

5 part-time rangers are employed by Stiftung Naturschutzpark. During the summer holidays (mid July – mid September) two mounted policemen of Hannover mounted police brigade patrolled the nature reserve. The mounted policemen are a very important help to control dog owners, riders and car drivers who disregard the nature reserve by-laws. This is a insufficient situation for a big area like the NLH. At least one well educated full-time warden is necessary. The ranger service in the NLH should be elaborated and funded comparably to the situation in National Parks.

B. EXTERNAL THREATS

- *The question of water extraction by the city of Hamburg (Hamburger Wasserwerke).*

The extraction of groundwater in the northern part of the diploma area continues and is still a cause of concern. It is practised since 30 years. The natural system changed in some factors and has developed in a way to adapt to the fact of water extraction. The scientific research and monitoring show, that the status quo is acceptable to soil, fauna and flora. Any changing of water extraction management, also outside of the Nature Reserve could have fatal consequences. The company has had permission to withdraw $27 \cdot 10^6 \text{ m}^3$ annually until 2004. However, the actually pumped up quantity is $16 \cdot 10^6 \text{ m}^3$ per annum. The concession for extraction of groundwater has expired in 2004, since then the continuation of extraction is in a state of transition. The policy of the NLH/VNP is, that the extraction in the nature reserve be reduced or, at least, be maintained at the present level. The Wasserwerke Hamburg wish to raise at $18,5 \cdot 10^6 \text{ m}^3$ per annum and would like to fix it at this level for the next 30 years. As the higher level of extraction is likely to affect sensitive areas, possible effects have been studied hydrogeologically and phytosociologically. The details of a 25 years study are published in *Hamburger Wasserwerke 2004* and *Klötzli 2004* (see Appendix II). More detailed studies and monitorings besides heath-vegetation and geology are necessary to get clear basics to identify the real affects of a possibly increasing extraction from $16 \cdot 10^6 \text{ m}^3$ to $18,5 \cdot 10^6 \text{ m}^3$ per annum. It is not clear in which way a higher level of water extraction influences the chemistry of the different types of soil. There is not enough information about

influences on forests and on the dynamics of water courses. A simulation modelling should be made for all factors possibly influencing the groundwater level, the soil, the brooks, the different types of vegetation including forests, the biotopes of red-list-species and the natural dynamic of the whole ecosystem.

- *Waste Management*

Domestic waste, paper, recycling waste and organic waste are collected regularly by different providers without problems concerning the reserve. Some problems are caused by illegal waste dumping. Although public waste collection systems are available everywhere, some people still try to avoid the (rather low charges) and litter their waste in wood or heath lands.

The reserve is also negatively affected by a very large waste deposit which is situated right on the southwestern border. The dump site is still in use and partially open. Fresh waste attracts large amounts of birds e.g. crows. Crows are natural predators for ground breeding birds and might damage the grouse population.

- *Incomplete data base concerning FFH-species*

The data base of the Land Lower Saxony concerning FFH-Species is still incomplete for Lüneburger Heide Nature Reserve. VNP has regularly reported species to the conservation agency of Lower Saxony and Soltau-Fallingb. conservation administration. The incomplete data base is a serious problem, as species that do exist in the reserve, are not listed and are not considered in planning procedures like the relocation of federal road B3 / K35.

- *Effects of agriculture, hunting, industry, etc.*

Possible negative effects of agriculture, industry, urban development, road building, tourism, hunting, fishing, etc. are legally prevented or curbed by the "*Verordnung der Bezirksregierung Lüneburg über das Naturschutzgebiet "Lüneburger heide" etc.*" from 1993. Agriculture inside the NLH is regulated through that "*Verordnung*" as well. There is a general will to respect this act and to co-operate among the municipalities and other bodies concerned.

Negative factors concerning agriculture are a risk for the continuing of the protection- and development-goals. 8 Biogas power plants were erected recently, most of them just outside the nature reserve border. Biogas power plants in the Lüneburg area are mainly fuelled by maize.

- The increasing cultivation of maize in the neighbouring areas of the Reserve with its huge amount of fertilizers is a new negative effect on the landscape, the soil and the groundwater and has to be reduced. The funding of intensive agricultural cultivation in the Nature Reserve NHL and in the neighbouring areas has to be reviewed.

Hunting is one kind of cultural heritage in the area like agriculture, fishing and forestry. It is not of great importance for nature protection. Nevertheless it is important to regulate the populations of ungulates to avoid negative influence on the forest and to the deer-population itself. Raptors like fox and marten have to be hunted and reduced in numbers to protect the Black Grouse and other populations of ground breeding birds. Hunting concepts, respecting all protection factors and the development of natural forests for all ungulate species red deer, roe deer and wild boar as well as raptor species are drawn up by the VNP.

- *Insufficient financial resources available for heathland maintenance activities*

The availability of sufficient financial resources remains a matter of continuous concern. Being a private organisation, the VNP depends for its financial resources largely on funding by the federal state of Lower Saxony; the members of the VNP (3079 in 2011) provide only a minor contribution. Although the concept and content of the NLH correspond to those of the federal nature parks, it is in a financially less secure position than those federal nature parks. The effect of nature conservation of the NLH is even higher as in federal nature- or national-parks. Most funds obtained is allocated to purchase land (see § 3.1). This expansion of

property of the VNP is very important for sustainable protection and means an extra burden for the management budget.

Several provisions of agricultural services are not funded, but are worth funding because of their high value for nature, landscape and nature-protection.

- The funding of the rearing by heathland sheep (Graue Gehörnte Heidschnucke) by the Federal Republic and the Land Lower Saxony is not ensured in future.
- Also the maintenance of the ancient horse race "Dülmener Pferd" should be ensured by acceptance as worth for funding by the Land Lower Saxony.
- Certain areas in the Nature Reserve of the NLH are managed and developed by agricultural measures without being accepted as effective agricultural area and without funding.
- These areas should be accepted for funding irrespective of their protection status. The same circumstance appears for areas with measures against natural reforestation and the grazing of half open forest-areas that are in the range between open land and closed forest.

A review of the EU- and the Lower-Saxony-funding system is recommended to prevent the fact, that the heath is only funded when doing nothing, instead of maintaining the aimed cultivation. Concretely, the fact to fund industrial farming instead of close-to-nature-farming in Nature Reserves should be revised. A very serious aspect concerning the funding of nature conservation in Lüneburger Heide nature reserve is linked with the legal status of heath- and moorland and the question whether they are agricultural land or not. It seems that some German farmers and politicians want to abolish the agricultural status of heath- and moorlands in order to acquire more European grants for intensively used farm land. During the last European agricultural reform (AGENDA 2008) this group already succeeded that German heathland farmers do not get so called "grassland grants" for their heathlands grazed by sheep, whereas e.g. British sheep farmers do get these important payments. In 2014 a new period of EU-promotion will begin. Heathland, grazed by sheep should get the same payments as grassland.

Stiftung Naturschutzpark aims to safeguard the legal status of valuable agricultural habitats like heath and moor lands, half-open forest-areas and link European grants even more to an ecological sound management of agricultural land. Funding for biogas plants and high subsidies for maize cultivation resulted in severe problems concerning scenic quality, ground water extraction for field irrigation and soil erosion. Stiftung Naturschutzpark appeals to nature conservation experts and politicians to make use of the European agricultural reform (AGENDA 2013) to enhance the chances for a more environmental friendly agriculture in nature reserves. Current economic conditions force farmers to maximize energy-plant production without taking nature into account.

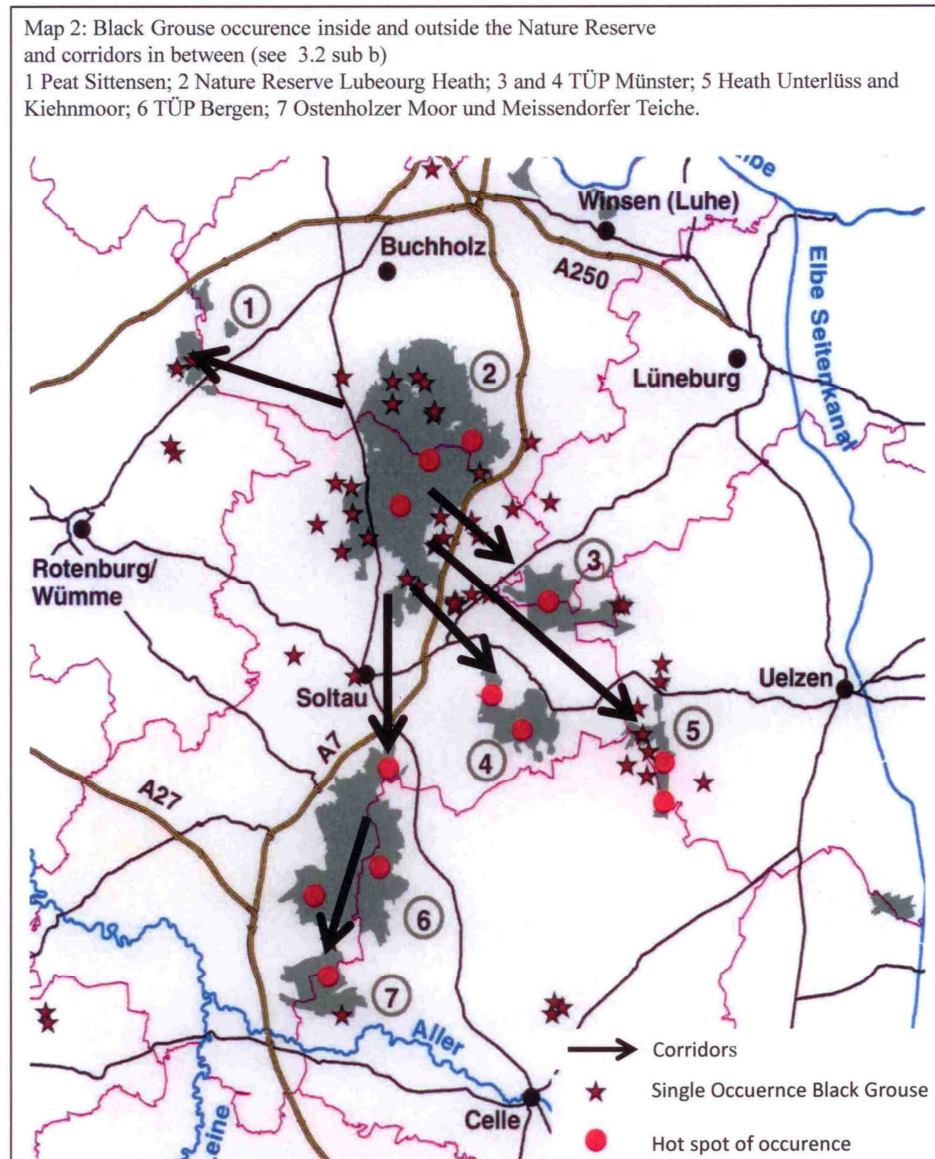
Valuable habitats which need low management intensity like heath- and moorlands should be put on a par with grasslands and arable fields concerning EC grants. Subsidies for organic farming and nature conservation measures should be in line with subsidies for cultivation of energy crops and installation of biogas plants in FFH areas.

Stiftung Naturschutzpark is concerned about the insufficient financial situation of the reserve. The federal state still fits Lüneburger Heide Nature Reserve a lot worse with financial resources than national parks, although historical cultural landscapes need a lot more intervention to be managed and preserved. Stiftung Naturschutzpark has cause for concern that the financial situation may even change for the worse and that it may then become impossible to cope with the demanding task of conserving the heathlands.

• *Wind power plants at the border of the NLH and installation of corridors.*

The region around Lüneburger Heide is qualified for optimal utilisation of windpower. A number of wind turbines have already been installed, some close to the Nature Reserve's border. Others are planned. Some will have a maximum height of more than 150 meters. They are very well visible from inside the Reserve. There are two kinds of impact on the Reserve. The

technical installations and the moving propellers disfigure the landscape of the Heath and reduce the worth of recreation and leisure. The moving propellers are a serious danger for birds, especially in the night. The need of exploiting wind power is respected. To protect the Nature Reserve from the negative impacts, future installations should, whenever possible, be installed in an appropriate distance to the Nature Reserve. Provision is made for corridors between the Nature Reserve and biotopes of high ecological value outside the Reserve. These corridors must be free of wind turbines. The regional planning administration should include these two facts in their considerations.



- *New motorway exit and pylons on BAB 7*

Near the border of the Nature Reserve the planning procedures (Planfeststellungsverfahren) for a new motorway exit on BAB 7 and relocation of federal road B3 and local road K 35 are still going on. Recommendations of VNP to minimise negative effects of this large infrastructure projects were mostly defeated. The new streets will damage highly valuable habitats like habitat 4030 “Dry European heath lands” and species listed in EC Habitat directive, Annex IV e.g. Smooth snake (*Coronella austriaca*), Sand lizard (*Lacerta agilis*) and several bats. An ecological audit concerning FFH habitats and species was carried out using an incomplete data base by planners. The nature conservation authority also used questionable interpretations concerning the status of listed species: Annex IV species like bats were not considered typical for European heath lands and therefore not included in the assessment.

Very high and illuminated advertising pylons along the BAB 7 motorway ruin the scenic quality of the nature reserve. During the last 2 years one more pylon was authorized which will be seen from nearly all view points in the eastern half of the reserve. The pylons also cause “light smog or light pollution”. Light pollution confuses animal navigation and threatens a lot of endangered species.

- *Insufficient buffer zone effect*

By founding 2007 the “Naturpark Lüneburger Heide”, which includes the Nature Reserve and surrounds it on totally 107'000 hectares, a certain protection of the bordering landscapes was achieved. This protection status is not strong enough, to prevent negative impacts from the surroundings into the Nature Reserve. The needs to reach full protection of the Nature Reserve and the prevention of negative impacts from outside can be achieved through regional planning administration in the surrounding Naturpark-area (see explanations in 3.2 sub a and b).

- *Possible need for supplementary protective actions.*

There is no direct need for supplementary protective actions. But there is need for more detailed monitoring of external affects to the NLH. There is also need to install the corridors between the Nature Reserve and biotops of high ecological value outside the Reserve.

3.3 ZONING

The zoning to prevent pressure of visitors on vulnerable sites is effectively curbed by the system of circular trails for visitors, limitation of access by carriages to specific routes, and the creation of a quietness area in the Red Zones for Curlews (*Numenius arquata*) and Cranes (*Grus grus*).

3.4 OWNERSHIP TITLE

There has been no expropriation during the past ten years.

VNP leased “Holmer Teiche” in 2010, an area of nearly 40 ha of fishing ponds and 50 ha of woodland. These ponds are unique in Lower Saxony and had in the past been used with very low intensity only. The traditional management system of summer- and winter carp ponds developed an abundance of rare plants and animals, e.g. osprey and sea eagle.

During 2010 VNP achieved a long term lease of nearly half of Freyenser Moor (73 ha of wood and moorland), a bog in the south west of the reserve. This bog was formerly used by farmers and is threatened by neophyte invasion and fall of ground water table.

3.5 LAND-USE PLANS

There are no land-use plans that may affect the area. Apart from that, there are small-scale plans to reorganise farming on an individual basis. On some farmland the cultivation of Maïs for biogazproduction is increasing. This has some influence of fertilizer in the soil and in the groundwater.

A monitoring for these influences including atmospheric input of phosphorus and nitrogen is necessary (see also 3.2 sub a, sub b).

3.6 DEVELOPMENT WORK LAUNCHED, UNDER WAY, OR TO BE LAUNCHED

The renaturation of brooks and associated wetland biotopes (wet brook valley grassland; Schmalter Aue and Sprengbach) is on its way (See § 3.2 sub a). Since the last on the spot appraisal in 2001, a lot of successful work for restoration has been realised. 100% of the Red Zones is in possession of the VNP now and nearly all of it have been successfully restored. Supporting measures for breeding places for endangered bird species like Wheatear (*Oenanthe oenanthe*) and others have been successfully realised and will be continued.

3.7 THE MANAGEMENT PLAN FOR THE AREA

The "Management and Development Plan" (*Pflege- und Entwicklungsplan Lüneburger Heide*) is based on § 1 of the federal law on nature protection. The goals for the protection and development of the NLH are based on article 3 of the ordinance of the Land Niedersachsen for the Nature Reserve Lüneburg Heath from 1993. The goals for protection are described and commented in detail in Keienburg, T. & J. Prüter. 2007 (see Appendix II).

The protection of the NLH is connected very close to an integrated understanding of landscape with the state of the flora, vegetation and fauna, and the main types of environment (watercourses and valleys, still water, peat bogs, heaths, forests, etc.). This is documented with a number of existing, newly made and also planned inventories and maps. The planning section compares the current situation with the ideal situation for each type of environment or habitat. On this basis, proposals are put forward for nature management and development. These proposals are also based on the experience gained from grazing, reaping, sod-cutting and deliberate burning operations carried out in experimental plots in different types of heathland in various locations. Special attention is being given to improving ecological gradients connected to the forest – heathland boundaries. This requires a sustained effort by the foresters. Actually, the state-owned parts of the forest are administered with the same concern for ecological management as the diploma area. A third section of the forest has been given full reserve status. Protection also aims on conservation measures of historical buildings, paths and the prehistoric megalithic tombs. Privately owned land has only partly limited land use measure.

3.8 THE RED ZONES

In the south/south-west of the Nature Reserve, near Schneverdingen, are the former British tank training grounds of the so-called Red Zones, an area of about 3'000 hectares. In 1994 a map was made of the state of the grounds, their development goals, and their reclamation and rehabilitation. Rehabilitation measures (landscaping, clearing, sowing, etc.) have been carried out by specialised staff. The heathland area has been enlarged by almost 32 %, with a greater diversity of habitats. This expansion made it possible to set aside a quiet area and to leave certain sites to natural succession. The 1993 regulations (see survey in § 3.1) also include in the NLH 940 hectares situated in the southern part of the Red Zones (Red Zone no. 3). Most of this area has been rehabilitated as heathland.

During the last ten years the destroyed soil in all the Red Zones has been, in a first step, successfully stabilized by Festuca-grass. Under the Festuca-vegetation the typical heathplant species like *Calluna* and *Erica* grew after 1 to 5 years and developed well to a covering vegetation. Tree species like pine and birch grew very quickly and have been eliminated. The number of plant- and animal species has ascended steeply in relation to the starting situation. Today, 100% of the Red Zones area inside the NLH is in possession of the VNP and managed by a professional staff.



Elimination of young forest trees to protect the development of the sprouting Calluna- and Erica-flora on former Red Zones. The work is done by hand, small and big machines. On certain areas half-open forests make symbiosis with the Heath-vegetation.



Obove: Typical Heath-landscape. Shepard going out with over 100 Heidschnucke (sheep).
Below: Regerminating Calluna and Erica on former Red Zones. Megalithic chambered tomb.



3.9 THE MANNER OF PUBLIC ACCESS, RECEPTION FACILITIES AND INFRASTRUCTURES

The NLH is open to the public. Owing to its central location, that is in the immediate vicinity of big cities like Hamburg, Bremen and Hannover, a large number of people come to the NLH every year, both from Germany as well as from abroad. The annual number of visitors is estimated at more than three millions. The tourist season is short, visits concentrate on the period July-August-September, especially on the weeks when the heather (*Calluna*) is in full bloom. Between 20 and 30 special visits every year for distinguished persons, groups etc. have been carried out.

The NLH is accessible by a number of public paved roads, with various parking lots, and a network of paths and trails. It offers the visitor 700 km paths and trails and 300 km bridle paths. A lot of infrastructure for visitor's information has been developed in collaboration with the Alfred Töpfer Akademie für Naturschutz. Among other things, 35 specific theme-routes have newly been specified and illustrated. 500 Points of Interest have been created inside the Nature Reserve and in the neighbouring areas. In 2011 a GPS-System for visitor's information was established.

There are information facilities at Wilsede, Niederhaverbeck, Döhle and Undeloh. Guided tours are available on request. In addition, the VNP provides a youth hostel and three hostels for older walkers. The VNP also owns several inns and boarding houses, in addition to which there are many inns and boarding houses in the villages within and around the boundaries of the NLH. There is a topographic map (1 : 40,000) available, accompanied by a booklet with information and tips. See further § 3.3 and 3.13 (sub training and education).

In 2008/2009 VNP and Stiftung Naturschutz (Trust) operated three information centres and one open – air museum. A fourth Information centre – “Döhle” was rented to the “Ant protection society”, a private institution that informs about “Ants - secret leaders of the world”. Information centre “Haverbeck” gives general information about Lüneburger Heide and conservation aspects. A small shop offers locally produced goods. Entrance is free and visitors are not counted.

Information centre “Seume-Haus - Undeloh” was closed in 2008 and completely renovated and equipped with modern information technology. It was reopened by Mr. Sander, Minister of the Environment of Lower Saxony, on 15th of July 2009. The “Heideerlebniszentrum” (Heath land Experience Centre) explains ecology and economy of the Lüneburg Heath with modern audio-visual methods. Geology and geomorphology are presented in a new film about the ice age history of the Lüneburg heath. A small cinema with surprising effects was installed in the basement of the building. All habitats of the nature reserve are presented with installations and interactive signboards. Historic people like shepherds, bee-keepers and farmers “talk” to the visitors about rural life in former times. Traditional craftsmanship is presented and modern conservation technologies are explained. The centre was financed by grants from the EC (European Fund for Regional Development), the State of Lower Saxony, private sponsorship and funds of the VNP. Entrance is free and visitors are therefore not counted. The new “Heath land Experience Centre” is very well visited and a lot of guided tours took place.

The open – air museum “Dat ole Hus” (“The old house”) in Wilsede is one of the oldest open-air museums in Germany. The old farmstead is furnished and equipped with exhibits of the “Heidebauernkultur”, the period of traditional heath land farming. A new exhibition was installed 2009 in one of the outbuildings to commemorate the “Verein Naturschutzpark (VNP)” 100. Birthday (since 1909). The history of VNP and the most important occurrences in the nature reserve during the last 100 years are presented in form of large “history books”.

3.10 SCIENTIFIC STUDIES NEEDED AND ACTIVITIES OF RESEARCH BODIES

The VNP has a close relation with the Alfred Töpfer Akademie für Naturschutz (formerly the Norddeutsche Naturschutzakademie), established in 1981 and accommodated at Hof Möhr near Schneverdingen, just inside the NLH limits. The Akademie is a member of the "Steuerungsgruppe" (Steering Group) of the NLH. In 2010 there were organised 144 seminars. 64 managers have been educated in training courses from 2006 to 2011 with concern to the NHL. Projects concerning foodplants, landscape-education, local biodiversity, GPS-information, visitor-guiding etc. have been realised. Annually, the Akademie carries out more than 20 projects inside the NLH as the effect of management on nutrients in heathland and oligotrophic grassland systems, controlled burning of heathland, public acceptance of management measures, the Offenlandproject, development of a GIS system. It co-operates with the VNP in the landscape maintenance farm (*Landschaftspflegehof*) Tütsberg (see § 3.13). The Akademie co-operates with Lüneburg University and participates internationally in e.g. the Heathland Network, TOPAS (Training of Protected Areas Staff, approved by EU).

The actual research on flora and fauna as well as research projects suggested by this paper are described in § 2.2.

3.11 POSSIBLE MEMBERSHIP OF OTHER INTERNATIONAL NETWORKS

- Natura 2000

- European Heathland Network

3.12 RELATIONSHIP BETWEEN THE BODY RESPONSIBLE FOR THE AREA, LOCAL ELECTED REPRESENTATIVES, OFFICIALS IN THE SOCIO-ECONOMIC SPHERE AND ASSOCIATIONS

The NHL (Naturpark Lüneburger Heide), managed by the private organisation "Verein Naturschutzpark e.V. (VNP)" with its public trust, is the central area of the "Naturpark" and the even larger touristic and semi-natural holiday-region Lüneburger Heide, merchandised by "The Lüneburger Heide GmbH". The relationship between the body responsible for the Nature Reserve and local elected representatives, officials in the socio-economic sphere and associations is organised in the so called "Steuerungsgruppe", a steering group including the two political bodies "Landkreise" Harburg and Soltau-Fallingb., the Land Lower Saxony, regional government of Lüneburg, forest administration Sellhorn and the VNP. There are regular formal and informal contacts and consultations once a month. For actual problems, ad hoc advisory groups of specialists and otherwise involved parties are formed. The local municipalities show their concern by financial support, though limited of course, maintenance of roads and efforts as regards e.g. sewage treatment. They and the population are well aware of the regional socio-economic importance of the NHL. Tourism associations are represented in the enlarged Steering Group.

3.13 THE TÜTSBERG LANDSCAPE MAINTENANCE FARM

The VNP's Tütsberg landscape maintenance farm or "Landschaftspflegehof" in the NLH has been established for the conservation, management and development of biotopes characteristic for the historical semi-autarkic heathland farming system. This farm wants to exemplify the combination of economy, close-to-nature exploitation, nature protection, and sustainability for the whole region. The farmland includes not only heathland for sheep grazing, but also extensively exploited arable (360 ha) and grassland (100 ha). Tütsberg not only maintains or restores historic buildings, crop rotation systems and crop combination systems, fertilisation practices and the like, but also preserves old cereal races and arable weed communities. Tütsberg is thus a experimental research farm, and an object for education and demonstration of an ecologically sound way of farming oriented at the objectives of nature conservation and landscape maintenance. On certain areas the former cultivation of the "Drei-

Felder-Wirtschaft", fallow land, winter-cereal, summer-cereal is shown. The farm appears to be quite successful. To provide a legal and financial basis for the "Landschaftspflegehof", an exploitation agreement was drawn up between the VNP and the federal state of Lower Saxony in 1988. Research started at the same time. Since 1993, the farming by the VNP is part of a more extensive public-legal agreement regulating the landscape maintenance on the VNP grounds as a matter of principle.

4 RECOMMENDATIONS WITH THE 2002 and 2007 RENEWALS OF THE EUROPEAN DIPLOMA

4.1 RECOMMENDATIONS 2002 and 2007

The European Diploma area of the NLH was visited the last time in 2001. The European Diploma was renewed in 2002 and in 2007. By a draft resolution, drawn up by the secretariat with a view to extending the validity of the Diploma for a further five-year period (2007 – 2012 appendix II) there were attached recommendations to the renewal 2007 without on-the-spot appraisal.

Attached recommendations to the renewal 2002:

1. the effective implementation of the management and development plan be encouraged by making the necessary financial means available to those responsible for management;
2. the implementation of the federal project "Lünebourger Heide" be continued;
3. the "red zone" rehabilitation measures be extended to the 960 ha situated in the southern part (zone No. 3);
4. the current boundaries of the award-winning area be extended to include the red zones;
5. training and education work be expanded, and in particular that the establishment of a corps of "rangers" be made a priority;
6. the objective of developing an additional information centre in Wilsede in the heart of the nature reserve be maintained;
7. the ecological management of the forests be continued;
8. the level in the water table continue to be closely monitored and an attempt be made to establish a link between an observed drop and the extraction of ground water.

Attached recommendations to the renewal 2007:

1. To pursue assignment of the ownership or the management of the state-owned grounds in the Red Zones to the Verein Naturschutzpark e.V.
2. To pursue complete termination of ground water extraction; if this proves futile, to pursue reduction or, at least, limitation of the concession to the quantity *de facto* extracted so far.
3. To pursue political recognition of the VNP's Lüneburger Heide Nature Reserve as deserving the same provisions for public financial funding as the Federal Nature Parks do have.
4. To create a corridor between the large heathlands east and west of Wilsede.
5. To continue the restoration of brooks and associated wetland biotopes (wet brook valley grassland).

6. To adhere to the model plan for annual reports.

4.2 STATE OF AFFAIRS

The recommendations to the renewal 2002 have been fulfilled completely except point 5, which is only partly fulfilled. The existing nature-warden-corps of 5 volunteers and part-timers is an insufficient situation for a big area like the NLH. At least one well educated full-time warden is necessary. The ranger service in the NLH should be elaborated and funded comparably to the situation in National Parks.

The recommendations to the renewal 2007 and newly appearing facts are commented as follows.

- *Ownership and the management of Red Zones*

In the last few years the VNP succeeded to acquire 100% of all Red Zones areas inside the NLH. The restauration and management is successful and assured on a high professional level.

- *The plan to build a railway line*

This project has been stopped. There are no more railway plans inside the Nature Reserve.

- *Water pumping*

Groundwater extraction is generally seen as possible in a quantity of max. $16 \cdot 10^6 \text{ m}^3$ a year. Experts of the VNP advert to the fact, that any increase of extraction could destroy the ecological system. The complete termination of ground water extraction is not seen as necessary. Water extraction by farmers irrigating their farmland is seen as a serious impact and must be coordinated with the extraction plans of the Wasserwerke Hamburg.

- *Availability of sufficient financial resources*

In § 3.2 sub b the difficult situation of the NLH because of lacking federal funding is described. The classification of the NLH on a level comparable with National Parks must be checked, because the value of the NLH as a hotspot for biodiversity and as a Nature Reserve can be classified higher than in a National Park. The political recognition of the VNP's Lüneburger Heide Nature Reserve as deserving the same provisions for public financial funding like the Federal Nature Parks do have, must be pursued. The Federal Republic of Germany gives strong regulations to the NLH, as well as to Federal National Parks, but gives not the same funding to the NLH.

- *Corridor between the large heathlands east and west of Wilsede*

A corridor to connect the heath east and west of the visitor's center Wilsede will be realised by the forest administration. The realisation and controls of this project should be kept on the agenda.

- *Restoration of brooks and associated wetland biotopes*

In § 3.2 sub a the situation of restoration is described in detail. The necessary works are proceeding well. The quality of the brooks and wetlands needs further development of measures.

- *Training and education: expansion of training and education work, establishment of a corps of "rangers"*

The development of a ranger service ("Naturwacht") is still on planning, but it is still detained by continuing lack of financial means. This problem is connected with the fact of political recognition of the VNP's Lüneburger Heide Nature Reserve as deserving the same provisions for public financial funding like the Federal Nature Parks.

- *Additional central nature information centre*

The information facilities at Niederhaverbeck, Döhle, Wilsede and Underloh continue to function well. The new heath land centre at Undeloh, a modern museum with interactive exhibits was very successful in its first year. The museum is open daily and more than 40.000 visitors came to see the new exhibits since reopening in July 2009. The museum is specialised in history, ecology and nature conservation of the reserve. During 2010 some new exhibits were taken on display as the museum is based on a modular concept that can easily be extended. In September 2010 VNP got several new “Nature – Discoverer Waistcoats”. These garments were developed by University of Göttingen, Department of Environmental Education, with focus on children and teenager in order to encourage their interest in ecology. The waistcoats contain field guides and small instruments like magnifying glass, compass and forceps. School classes can hire the waistcoats and organize their own excursions.

- *Continuation of ecological management of the forests*

Ecological management of the forests in state and associated ownership is assured. The responsible forestry authorities are represented in the Steering Group for the NLH by the head of the Staatliche Forstamt Sellhorn. See also § 3.7. Still there are monocroppings of spruce (*Picea abies*) inside the Nature Reserve. They are managed as well as possible by converting them to mixed forest, especially with pine and beech. One important thing to mention is, that also the Oak must be respected in this process as a typical species of the region.

- *Annual reports*

Annual reports are given by the VNP with all the necessary content. During the on-the-spot appraisal in 2011 the structuring of the annual reports was discussed and some ideas for amelioration were given.

- *Wind turbines and corridors*

Planning procedures and public discussion concerning more and even higher wind turbines continued in 2010. A planning zone for a new wind park was allocated in the latest Land Development Document for the district of Soltau-Fallingb. (Flächennutzungsplan). Very high turbines can now be erected only a few kilometres east of the reserve boundary (over 150 metres). Decisions were made without taking VNPs' concept concerning migration routes for black grouse (see last years' report and Map 2) adequately into account. The new wind park near Volkwardingen might block one of the most important migration routes for black grouse from Lüneburger Heide nature reserve towards the large military exercise grounds east of motorway 7. Populations of these highly endangered birds do only exist within the nature reserve and on a couple of military training areas. The black grouse is extinct in all other parts of north western Germany.

- *Impact from projects planned outside but near the Nature Reserve – regional planning*

Regional planning in the Naturpark-area (107'000 ha) has to respect and include all the knowledge existing for nature protection in the NLH. Direct negative impacts of the above mentioned matters have to be specified and eliminated. The elaboration of a concept to realise buffer-zone-areas with a high protection status is recommended.

4.3 CONCLUDING REMARK ON THE ANNUAL REPORTS

The management board of the Nature Reserve Lünebourg Heath and it's staff succeeded in fulfilling nearly all the recommendations of the last ten years. Some remaining agendas are mostly up to the missing federal funding and the acceptance of the status of the NLH comparable to Federal National Parks. Some problems like the restoration of brooks or the increasing cultivation of energy crops are linked with private ground owners and funding strategies. The coordination between regional planning administration and the VNP/NLH is dissatisfying and creates possible negative impacts for the Nature Reserve. Scientific research is on a high level and the data available are sufficient, if respected by all parties involved, as a basis to achieve the goals.

5 RECOMMENDATIONS

In view of my findings as presented in the preceding, and considering the dedication and professional skill of the managers, I propose that the European Diploma be renewed. I suggest attaching the following recommendations to the renewal:

1. to pursue reduction or, at least, limitation of the concession of ground-water extraction to the quantity extracted so far and coordinate the ground-water extraction for irrigation on farmland technically and quantitative with the activities and infrastructures of Wasserwerke Hamburg. Carry out additional studies and monitorings in order to collect more information about influences of all kind of water extraction on nature and ecosystems. A simulation modelling should be made for all factors possibly influencing the groundwater level, the soil, the brooks, the different types of vegetation including forests, the biotopes of red-list-species and the natural dynamic of the whole ecosystem
2. to pursue political recognition of the VNP's Lüneburger Heide Nature Reserve (NLH) as deserving the same provisions for public financial funding as the Federal Nature Parks do have.
3. to reconsider the ongoing practice of agricultural funding and to persue recognition of all types of heathland cultivation and all heathland restoring activities as a kind of greenland cultivation with the same amount of financial funding, especially by the EU-funding period 2013-2020.
4. to persue continuation of funding the rearing of the "Heidschnucke" (Heathlandsheep) by the Land Lower Saxony and the Federal Republic and recognition of the "Dülmener Pferde" (Heathlandhorses) as worth to subsidize by the rear-premium of the Land Lower Saxony.
5. to develop a concept for connecting the large heathlands areas east and west of Wilsede by a ecological corridor.
6. to persue restoration of brooks and associated wetland biotopes.
7. to reduce areas with cultivation of energy-crops, especially Maize, to a level, that might not affect the Nature Reserve's flora, fauna, groundwater and the scenic attractions.
8. to continue ecological forest management and convert monocroppings of spruce into mixed forests including the Oak.
9. to assure, that existing scientific data are included and respected in regional planning processes and to ensure that negativ impact to the Nature Reserve from outside the area's boundery is prevented. Before licensing a wind farm or any other project in the neighbourhood of the reserve, carry out sufficient and detailed studies taking into account the duly formulated VNP recommendations,
10. to complete data base of the Land Lower Saxony concerning FFH-Species so that all species existing in the reserve are listed and considered in regional, national and federal planning procedures.
11. to create suitable ecological corridors between the Nature Reserve and Black Grouse biotopes outside the Reserve without endangering infrastructures like wind-turbines or the like.
12. to elaborate a concept to realise buffer-zone-areas with a high protection status in the neighbouring areas of the Nature Reserve.
13. to establish a corps of rangers (Naturwacht).