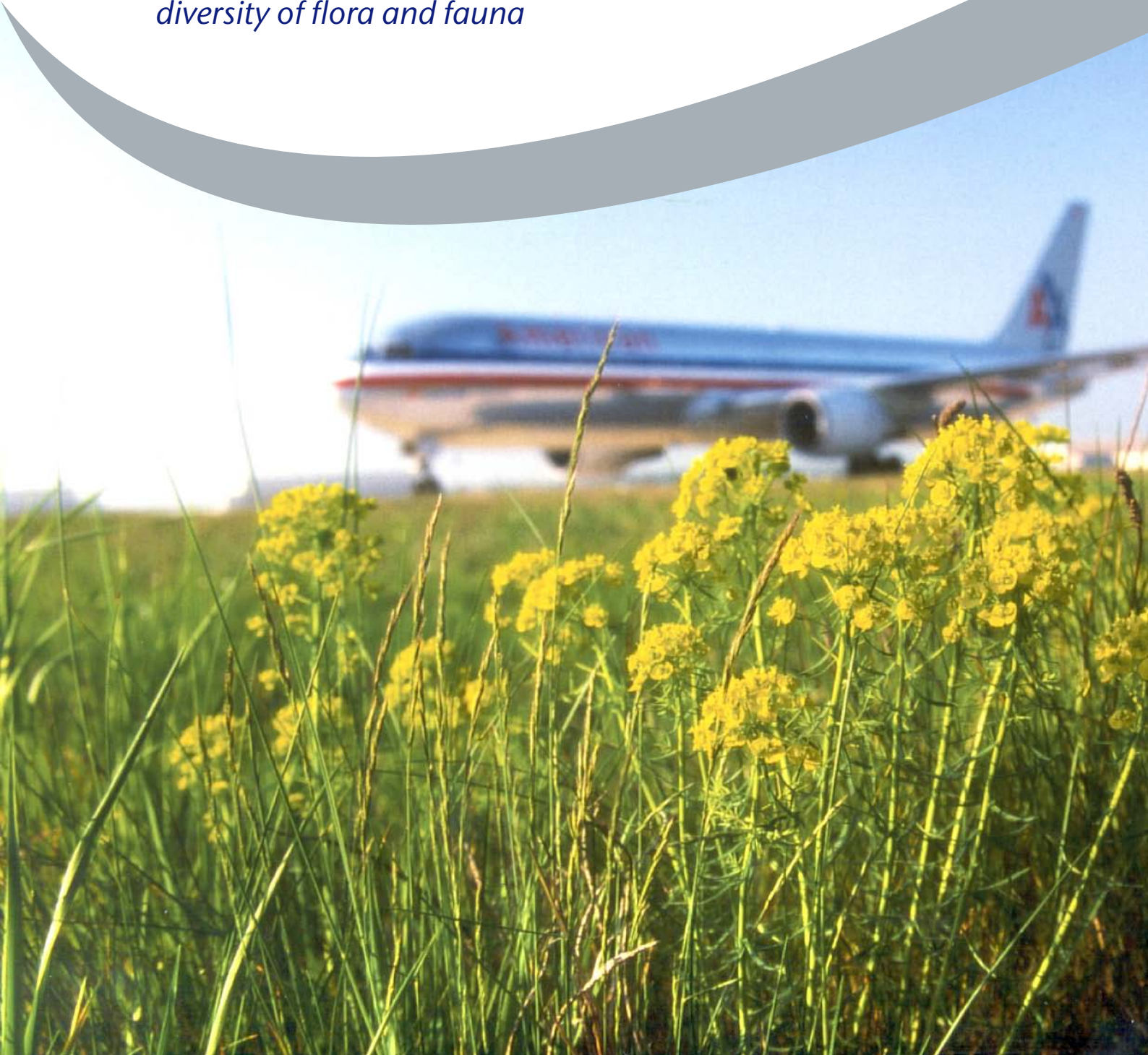


Protecting the Environment – Preserving Biodiversity

*Fraport activities for the preservation of the natural
diversity of flora and fauna*



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1 Fraport Environmental Management Principles on Biodiversity

Our business activities are compatible with the conservation of the natural biodiversity.

Near natural areas and their immanent biodiversity are maintained and promoted, with constraints of the general operating conditions in mind. Adverse effects are kept as low as possible. An at least con-

genial adjustment or an equivalent alternative is made in case of extensive disturbances, whose functional preservation we assure in the long term.



2 Foreword: Why we are involved in the protection of natural biodiversity

One would normally associate environmental aspects such as aircraft noise, air cleanliness, or resource conservation as part of an airport's environmental management. Fraport's environmental management exceeds the classic scope of duties and has, in the meantime, set itself the goal to maintain natural biodiversity at Frankfurt Airport.

We are convinced, however, that Fraport must in this case – just as it has in noise abatement and air cleanliness – take over environmental responsibility that goes beyond the legal guidelines. Our company acknowledges the goals of a lasting economic activity, and a core element of our sustainability strategy is effective environmental protection. The preservation of biodiversity is a future task that, according to many experts, plays a similarly significant role as climate protection.

What is it all about? Biodiversity is defined as a biologically varied biologic community, giving its ecosystem a high degree of stability due to the diversity of species,

especially in the case of outside changes that affect the ecosystem. The consequence for us, in order to lastingly protect our environment, is that we must preserve the natural diversity of species.

Hence, Fraport has decided to support projects outside of the airport premises that preserve the biological diversity in the region of Frankfurt/Rhine-Main and Hesse using the Environment Fund. Our presented "Fraport Biodiversity Strategy" illustrates our principles on this important topic and documents diversity projects that we arrange or fund, both at the airport and in the region.

Dr. Peter Marx
Vice President of Environmental Management (VAU)
Fraport AG

3 Introduction

3.1 What does biodiversity mean?

Biodiversity is perceived as the variety of life forms on Earth, the result of hundreds of millions years of evolutionary history. Science differentiates between four aspects of diversity that influence one another and should be considered each with a closer examination:

- Genetic diversity
- Variety of species
- Ecosystem diversity (i.e. variety of habitats)
- Functional biodiversity (i.e. variety of biological interactions)

“Biological Diversity”, or biodiversity, became a buzzword in the 1980’s in both scientific and political discussions. Special merits were not only awarded to scientists such as R.E. Wilson-Hackenshamer and E.O. Wilson but also to the American president Jimmy Carter.

Biodiversity is imperative for the stability of ecosystems. Biotic communities with a greater variety of species are more resistant towards outside influences due to their multifaceted back coupling.



On the contrary, the reduction or eradication of species, which can happen as a result of environmental contamination or area encapsulation, leads to an impoverishment of flora and fauna and, in the worst case, to a complete collapse of the affected ecosystem. A highly developed biodiversity must be regarded as a vital prerequisite for the adaptation of species to changing environmental conditions, also amongst themselves.

3.2 Guidelines of the Biological Diversity Convention

The term “biodiversity” has gained increasing importance, also in a political context. Its historical origin is the Convention on Biological Diversity, adopted in 1992 at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro. At this conference, three goals were set when dealing with biological diversity:

- Its protection and maintenance
- The sustainable use of its components
- The fair distribution of the resulting advantages from the genetic resources

Meanwhile, 179 countries and the European Union have joined the treaty. In the year 2000, the United Nations introduced an “International Day for Biological Diversity,” scheduled on the day on which the convention had been adopted (May 22nd).

4 Habitat Frankfurt Airport

Frankfurt Airport covers an area of approximately 19 km² and is home to a notable, vast variety of animal and plant species.

In the last years, Frankfurt Airport was evaluated regarding its biotope quality. The Senckenberg Research Institute completed an inventory mapping of the airport as well as of neighboring measuring areas outside of the airport site.



The airport premises are, as expected, strongly influenced by human use. The low and very low-grade areas dominate with over 60 percent. Substantial portions thereof are the sealed runways, taxiways, aprons, parking areas, and airport operational facilities.

The middle grade areas comprise approximately a third of the airport biotope complex. This is primarily a matter of grassland assets in the vicinity of taxiways and runways. The green areas between the runways represent the largest agriculturally unused area in the Rhine-Main region and amount to approximately 500 hectares. It offers a habitat to many plant and animal species that are elsewhere partially considered endangered.

From the perspective of nature preservation, very high-grade areas have developed in the outskirt areas of runway 18 (west). The areas on which a wide range of extensive grasslands, neglected grasslands, sandy dry grasslands and heather (*Calluna*

vulgaris) are located, comprise only a small portion of the biotope complex with approximately four percent. However, area-wise it is the largest connected heath, drying, and neglected grassland area in the Frankfurt/Rhine-Main region. Over the past years, these areas evolved into a retreat area for flora and fauna, including species that are endangered and listed on the Red List.

There are approximately 300 plant species that can be found on the airport premises in total. As an example, vascular plants, which only grow in acid producing and low nutrient soils, were mapped. Furthermore, the evaluated areas within the airport premises also accommodate a greater number of uncultivated garden plants, which presumably come from nearby parks. Seven percent of the total number of identified species are considered endangered, in decline, or protected by law.

Not only the flora distinguishes itself with its remarkable variety of species but also the fauna. One can find a variety of amphibians and bird species such as the northern wheatear (*Oenanthe oenanthe*), the African stonechat (*Saxicola torquata*), or the winchat (*Saxicola rubetra*). Rare species such as natterjack toads (*Bufo calamita*), agile frogs (*Rana dalmatina*), and praying mantids (*Mantis religiosa*) appear in the spring and summer months by now.



Fraport AG owns approximately 300 hectares of forest surrounding the airport. These wooded areas are cultivated according to the legal flight clearance guidelines regarding the runways and at the same time apply the principles of sustainable forestry. Since they possess high biotope quality, these areas are largely designated as Natura-2000-areas.

4.1 Principles of Biodiversity

Experience shows that one can combine a technologically developed and economically successful airport operation with the conservation of natural biodiversity. Fraport's Environmental Management has set itself the goal to maintain and actively guide biodiversity on airport premises in a way that corresponding ecosystems are preserved, despite operational activities. The best solution in this context is to keep the impact of airport operations on the diversity of species as low as possible. Wherever unavoidable, significant disturbances due to operational activities occur, they are compensated or substituted for in a manner which is at least equal in its biological value. Whenever possible, it is aspired to further improve the quality with the implementation of such measures. The planning and execution of projects for the protection and conservation of natural biodiversity are designed so that the continuous functional integrity is warranted.

During the planning of construction projects at the airport, all parties involved should carry out these plans with utmost consideration of the plant and animal world, so that minimal adverse effects arise.

Since it is often not feasible to create mitigation measure areas within the airport premises, the focus is placed on creating new sustainable habitats in the direct vicinity of the airport in order to maintain the

species diversity in the region. As a result, Fraport goes beyond the legal guidelines whenever possible for example by reforesting more wood than prescribed by law.

Environmental Acceptability Studies for Larger Construction Projects

In the forefront of planned construction projects for the addition of capacity, environmental acceptability studies are prepared within the framework of plan approval procedures; thus the direct and indirect impacts of projects are picked up at an early stage and are then evaluated and presented in a report. By using the same procedures, the possible environmental effects of the planned construction of Terminal 3 and the northwest runway can be judged and assessed. The gained results flow into the decision making process on the implementation of the respective measures.

The impact of the project on man, landscape, water, air, climate, soil as well as on flora and fauna is researched within the scope of these studies. Even interactions between specific environmental facets play a role. Separate expert opinions are compiled concerning the European legal specifications on nature and species conservation. All relevant findings from the surveys are then incorporated into the precise planning process.

4.2 Development of Environmental Protection in Terms of Biodiversity at Frankfurt Airport

Fraport orientates itself strictly on the legal guidelines when it comes to the evaluation of environmental impacts on flora and fauna in their natural habitats on the airport premises. Amongst others, the Council Directive 92/43/EEC on the conservation of natural habitats and of the wild fauna and flora site (Habitats Directive), European Birds Directive, Federal Nature Conservation Act (BNatSchG) and Hessian Nature Conservation Act (HENatG) count towards these guidelines.

Environmental protection has a long history at Frankfurt Airport. Already in the year 1972, the company preceding Fraport declared environmental protection to be a major part of the company policy. In the following decades, an efficient environmental

management was gradually established. The environmental managers of Fraport attach great importance to the protection and conservation of biodiversity at the airport and its surroundings.

Inspections done by the Senckenberg Research Institute in the years 2000 to 2004 confirm the success of these activities. In 1999, Frankfurt Airport underwent the first stringent environmental audit regulated by the European "Eco-Management and Audit Scheme" (EMAS). Additionally, the environmental management is certified under the ISO 14001 since 2002.

Environmental management at Frankfurt Airport is reviewed annually by government accredited auditors. The EMAS validation requires verifiable evalua-

tions of the essential environmental impacts, the availability of a functioning environmental management system and an environmental statement in the form of a publication accessible to the public. EMAS and ISO 14001 have high standards for Fraport's Environmental Management. This means, Fraport must formulate and document its operational environmental policies and, in this context, the tracked environmental objectives and measures in an envi-

ronmental program. Major goals – aside from the legal conformity of all environmental protection measures that are implemented and followed by Environmental Management in strategic business and service units – are the continuous quantitative improvements of environmental efforts, the transparency as well as the willingness to communicate refer to public relations and activities that go beyond legal guidelines.

5 Fraport AG Biodiversity Funding

Fraport is actively involved in the conservation of biodiversity not only on the airport premises, but also in the Frankfurt/Rhine-Main region and in the federal state of Hesse.

An Environmental Fund was created to effectively contribute to the preservation of nature and environment and therewith especially biodiversity. Since its establishment in 1997, over 500 projects have been financed with over 22.5 million euros (stand 2008) in the fields of nature conservation, environmental protection (including biodiversity), environmental education and eco research. These funds demonstrate a voluntary effort on behalf of the company. Therefore, selected projects supporting lasting biodiversity in the region, that are normally depend upon sparingly distributed government aid money, can be financially assisted. Alone for the years 2009 and 2010, subsidies in the amount of approximately four million euros are planned.

Preferably high percentage of near-natural green spaces and minimized encapsulation during the execution of construction projects

In line with the airport extension, measures are also being taken to promote a lasting biodiversity. That means that operational interferences in habitats are to be kept at a minimum level. The goal is to allow a large portion of near-natural green spaces to remain, for example, during the execution of con-

struction projects and to keep the area encapsulation as low as possible. For Fraport, it is of particular concern to establish compensation areas as an adequate alternative for encroachments in the environment and nature to maintain natural resources in the airport vicinity and in the Frankfurt/Rhine-Main region.

In order to lastingly support the ecological variety, one must solidly and knowledgeably establish mitigation measures. Based on this, Fraport has decided to go beyond the legal specifications and place professional considerations in the foreground.

In terms of the planned airport expansion, areas were bought and reforested in advance. It is a primary objective to recreate valuable forest stands, like the alluvial forest along the Rhine.

Often, agriculturally used areas were transformed into forests again within the compensatory measures. By these means of renaturation, fauna and flora noticeably improved in the affected areas. This also benefits the whole region.

Today, Fraport is amongst the few companies worldwide that has long lasting and extensive experience in the development of high-quality biotope complexes and can show the best results at the same time.

6 An Overview of Projects funded by Fraport

The following pages detail a few selected projects that protect and promote biodiversity. On the one hand, this includes measures that Fraport undergoes and underwent during construction projects at

the airport. The second part describes the projects in the Rhine-Main region and in Hesse that receive financial aid from the Fraport Environmental Fund.

6.1 Reforestation and Enhancement

Within the framework of airport expansion and larger construction projects, such as the construction of the A380 maintenance hangar, Fraport is carrying out mitigation and improvement measures elsewhere. It is of particular interest to create and develop long-term, near-natural biotopes worthy of protection. Forests are either taken out of cultivation or monotonous fields are turned into near-natural forested locations. The improved areas can be used for local recreation wherever compatible.



6.1.1 Natural Conservation Area Hohenaue – Alluvial Forest

The Natural Conservation Area Hohenaue, located in the rural district of Groß-Gerau, is an area previously used for intense agricultural purposes, which was planned and executed as a legal nature and forest protection compensation measure especially for the CargoCity South.

Purchased by Fraport in 1991, this area encompasses approximately 100 hectares of land and is located near Trebur at a backwater of the Rhine River.

The terrain was reforested to allow new woodland area to emerge. The goal of the reforestation was to create an interconnected, near-natural wooded area that could also be used for recreational purposes by the public in the surrounding area. Groves of hard and soft woods, native to water meadows, were planted on the terrain. Additionally, a scenic trail was designated, which is regularly cultivated; information boards were put up so that visitors can inform themselves about the natural history features as well as the variety of flora and fauna in this area. Based on the outstanding development, Hohenaue was declared a nature conservation area in 1998.

Result Testing of Compensation, Contingency and Mitigation Measures

Ten years after the reforestation, Fraport commissioned the University of Gießen to conduct a functional control. The irrefutable result was that the reforestation and extensification measures had explicitly improved the flora and fauna of the surrounding region. The experience gained from the planning and execution of the initiative at Hohenaue is being incorporated into the upcoming further development of the alluvial forest in the regions of Langenau/Nonnenau, Kornsand-Nord, and Rockenwörth/Rauchenau. The planning of near-natural woods, the design of skirts of the wood, the acquisition of suitable seeds for trees and shrubs, as well as the layout of glades and wetland biotope are placed in the center.

6.1.2 Reforestation of Hofgut Schönau

Fraport is reforesting 21 hectares of land within the realm of the project "Hofgut Schönau" in the district of Rüsselsheim to compensate for the loss of land due to the construction of the A380 maintenance hangar. Before the first tree was felled in September 2005 on the hangar premises, the compensatory planting had already been started.

Over 130,000 trees and 10,000 shrubs were planted at Hofgut Schönau in Rüsselsheim in order to create a new site for a mixed deciduous forest, dominated by oak trees, on agricultural cropland. The concept contains upstream grasslands, optical paths and shrub hedges, and existing kindlings were integrated into the planning. A pond was installed in spring 2006 in order to improve the habitat quality



by providing a spawning ground for dragonflies and amphibians.

The selection of plantings ranges from the common oak (*Quercus pedunculata*) to the beech (*Fagus*), cherry (*Prunus*), sycamore maple (*Acer pseudoplatanus*) and the common walnut (*Juglans regia*). All of the seedlings originated from seeds from the region and were cultivated in a local tree nursery.

6.1.3 Upgrading of existing forests: utilization and abandonment of the Mörfelden wooded area



Within the addition of the plan approval for the construction of the A380 maintenance hangar, the wooded area "Mönchbruch of Mörfelden" was designated as a mitigation area. The goal in this case was to improve the state of the existing forest stand.

The forest contains a high number of oaks and partially mixed forest – among others European Hornbeam (*Carpinus betulus*), pines (*Pinus*), and Silver Birch (*Betula pendula*). With accordance to the Habitats Directive and the here stated preservation objectives, the amount of Common Oak old growth and dead wood is a quality characteristic of the favorable peculiarity of the type of habitat. Therefore, the measures areas are cultivated so that a multi-layered age distribution – a result of time staggered development – is maintained to preserve old and dead wood, preferably oaks. This means that these exist as long as possible and existing old trees are kept free of disturbing and incapacitating trees.

In view of the faunistic sustainability and biodiversity, the revaluation measure also proves itself to be suitable. The woodland serves as a habitat for species worthy of protection, such as the Bechstein's bat (*Myotis bechsteinii*), which prefers a structurally-rich deciduous forest with adequate quarters. The area is monitored to assure the effectiveness of the measures. Furthermore, Fraport AG has mounted bat-nesting boxes in suitable places with little dead wood.

Stag beetles, for example, also have a suitable habitat due to the existence of uprooted stumps. Moreover, Bechstein's bats find good food sources and enough living quarters in the structurally-rich deciduous forest.

6.2 Resettlement of faunistically valuable species

If encroachments or disturbances threaten existing biodiversity in the course of the construction projects, mitigative and preventative measures will be taken, such as the resettlement of protected species.

Fraport not only engages itself in connection with supporting lasting biodiversity, but also pays particular attention to the execution of special measures that serve to protect species worthy of conservation. An example of such a measure is the relocation of small animals.

6.2.1 Resettlement of sand lizards

Even though they appear quite often in the Rhine-Main region, the Sand Lizard (*Lacerta agilis*) is a species that is to be stringently protected according to the Ordinance for the amendment of the Federal Ordinance on the Conservation of Species and the

Habitats Directive. In the area of the fuel depot ("POL yard"), in the former US-Air Base that is to be dismantled, a main source of this lizard species was detected, since it feels particularly comfortable on the sunny, dry and earth covered tank mounds. In agreement with the lower nature conservation authority, the lizards were caught and transferred to



the treeless, shifting sand dune area, west of the Airportring (Okrißteiler Straße) in the extension of the southern runway.

Ongoing monitoring of this resettlement will continue at least until 2013. Every spring, when weather conditions are suitable, three area-wide inspections of the compensatory location are made, where number, age and locality of the lizards are documented.

6.2.2 Relocation of stag beetles

As a special species conservation measure, tree roots containing stag beetle (*Lucanus cervus*) larvae were relocated in August and September of 2005 before the construction of the A380 maintenance hangar started. In the course of the construction project, approximately 20 hectares of forest in the south end of the airport were to be uprooted. This forest sheltered numerous sources of the stag beetle species *Lucanus cervus*. The stag beetle species favors a moderate climate in combination with a sandy, dry land and a high proportion of oak trees. Worth mentioning is that this species is to be stringently protected according to the Ordinance for the amendment of the Federal Ordinance on the Conservation of Species and the adaptation of further legal provisions and the Habitats Directive.

The new locations can be found no more than one kilometer away from the area of intrusion and they respectively offer optimal soil requirements. Stumps were chosen that exhibit a high likelihood to be colonized by stag beetles. The majority of stumps



was covered with trunk wood to prevent them from being churned up by wild boars.

In addition, ten tree stumps were fenced in and covered with nets to control the success results. Many stag beetles were found in the months of May and June 2006, which proves the effectiveness of the resettlement measure.

6.3 Frankfurt Region – Promotion of sustainability and landscape

It is one of Fraport's principles to not limit the company's environmental protection to the airport premises. That is why one is aspired to support projects within the surrounding region of Frankfurt that are interesting from an environmental protection point of view; these projects deal with the existing species or areas that are in danger or require lasting support measures. Fundamentally, it is Fraport's goal to maintain the diversity of the Frankfurt/Rhine-Main region with regard to the attractive nature and landscape experiences and, whenever possible, to support its further development. The following examples demonstrate how the guidelines are practically implemented.

6.3.1 Rhine-Main Regional Park – Sponsoring of Environmental Protection Concepts in the Surrounding Area

The most extensive environmental project that Fraport sponsors is the Rhine-Main Regional Park, initiated in 1994. This project follows the philosophy of not only passively protecting and conserving existing open spaces, but instead to actively develop and duly feature them. An infrastructure for experiencing nature is encouraged for this purpose.

Since the initiation of the development, 70 km of routes were laid out and over 100 individual pro-

jects, costing approximately 30 million euros, were set into action. This was financed by donations of associations from communities, federal and EU funds, as well as from sponsorship money, particularly from the Fraport AG.

Overall, the regional park is a multifaceted reflection of the natural and cultural diversity of the region. One of the first projects to be conceived was a bike path that goes around the regional park. In addition, a bike path and hiking trail enclose the city of Offenbach. A weather park on the Buchhügel can also be found there, which allows visitors to get information about weather formation, recording and forecasting.

The Flörsheim watchtower is part of the regional park, as are an orchard route, a rose garden, a playground for children, several observation towers and

in the Taunus. Favorably reviewed were Orchids, types of fens and species with specific indicator values, for example fascinating cold and low temperature indicators with regard to the current global warming. The goal is the development and later release of updated distribution maps of the plants.

The Faculty of Botany at the Johann Wolfgang Goethe University in Frankfurt has been working together with the Taunus Botanical Working Group since 1997 concerning the execution of the plan to comprehensively document the scenic changes in respect of the Taunus flora.

The data needed for this documentation is taken so that it is analyzable for the different requirements of nature conservation, environmental monitoring and landscaping. In addition to a detailed census of the species population in the spatially defined habitats



many other things. Alongside the promotion of biodiversity, the regional park contributes to giving the Rhine-Main area a "natural" identity, to increase the recreational value and to boost the attractiveness as a living and working area.

6.3.2 Unique Flora in the Taunus

The Taunus, a German low mountain range and part of the Rhenish Slate Mountains, extends through the state of Hesse north of the cities Frankfurt and Wiesbaden. The Taunus is an area characterized by its touristic infrastructure displayed in the very environmentally friendly landscape. Hiking trails with refuges, nature trails, and cross-country ski-tracks shape the scenic picture in winter. In the summer, sunbathing areas, spring tapping and observation towers are used for recreation. Additionally, water treading pools, barbecue areas and youth camping sites allow for active contact with the nature. It is of utmost concern to Fraport AG to conserve this natural scenery and its unique flora. That is why it was decided to make a current survey of the plant communities. For this reason, the Fraport Environment Fund has funded the mapping of vascular plant flora

and grids, permanent landscape ecological observation areas were established for biomonitoring. The data gained allows statements about the landscape changes over a longer period and can be used in the preparation of operation proposals for the nature conservational landscape preservation.

The mapping takes place in four sections, the first one being the area that encompasses the central Taunus region. The southern and the near-ridge northern Taunus region belong to the second section. The presentation of these mapping results is conducted on grid maps, which make the processing using a geographic information system possible. A precise survey of the sources of floristic remarkable species, such as species on the Hessian Red List, is made.

More than 450 species were verified in the grids. In addition, many endangered species from the Red List could be identified. Additionally, atlantic-sub-mediterranean species were detected such as the stinking hellebore (*Helleborus foetidus*) or the wall barley (*Hordeum murinum*). The latter is encountered near human settlements.

6.3.3 Variety of species in the River Meadows

Fraport supports the “Stromtalwiesen” project in the community Riedstadt by Leeheim, which borders the largest Hessian nature conservation area Kühkopf-Knoblauchsäule. “Stromtalwiesen” are alluvial meadows of river valleys.

As explained in Annex I of the EU Habitats Directive, the “Stromtalwiesen” is a type of biotope for which Germany carries special responsibility with regard to its protection and preservation. The in place encountered wet grasslands belong to the most endangered plant communities in Central Europe as a result of dehydration measures, grassland change and intensive agricultural usage. An extremely



unstable water balance is typical for the meadow grassland community sites. Due to snowmelts, the spring months bring floods lasting for several weeks, whereas the dry and hot summers dry out the land, leaving the vegetation in extremely dry conditions due to the lack of ground water. Therefore, the existing species must be tolerant towards both dry and wet conditions.

The main interest in the project was to recreate the rare “Stromtalwiesen” as well as to resettle quality-determining key species. The execution of these measures was carried out in collaboration with the Riedstadt community, the University of Gießen, the federal state of Hesse, the Federal Nature Conservation Agency and with the most important sponsor, the Fraport AG. Based on the little success of previous efforts for the renaturation of the species-rich “Stromtalwiesen” as well as exceptionally high national and international professional nature conservation importance of this FFH habitat type, a testing and development plan of the federal office for environmental protection was conducted in the community of Riedstadt in the area of the Hessian Upper Rhine west of Darmstadt from October 2000 until March 2005. A total of 47.7 hectares of suitable

land were allocated for the renaturation projects, of which a large portion had been used for intense agronomic purposes before. An essential part of the project was the process of renaturing the “Stromtalwiesen”, the evaluation of agricultural land use options that conform with nature protection, as well as the protection and development of the remaining, endangered “Stromtalwiesen” sites that are of international importance.

The transference of areal grass cuttings was used in the project. The growth of existing stocks of alluvial and molinia meadows in the vicinity of the project area served as a donor for the grass cuttings. The areal grass cutting measures were carried out by local farmers, who partially took over the utilization later. A trusting cooperation arose with the farmers during the project, which will as users guarantee the long-term preservation of this species-rich green space. The measures were recorded in detail and pinpointed in a geographic information system as a basis for scientific monitoring by the University of Gießen. The results from the project are consistently positive. Within three to four years, over 100 plant species could develop from the grass cuttings, including the endangered species previously found on the Red List such as the blue iris (*Iris spuria*), the meadow violet (*Viola pumila*), and the spear-leaved skullcap (*Scutellaria hastifolia*).

Within three years, these project areas have demonstrated a remarkable species and individual-rich fauna. From a faunistic point of view, the “Stromtalwiesen” represent very species-rich habitats. Within this time period, over 600 animal species could be identified at these sites – including ground beetles (*Carabidae*), bugs, grasshoppers, butterflies and zygaenidae. Even rare and endangered animal species from the Red List such as the bug species *Strongilocoris* and the Fisher’s estuarine moth (*Gortyna borelii*) were found.

6.3.4 Orchard meadows in the Maintal

The maintenance and tendance of specific habitats in the region are of special importance regarding its promotion with the aid of the Fraport Environmental Fund. Included in this is the largest Hessian orchard meadow complex near Bergen-Enkheim and Maintal.

Orchard meadow is a traditional cultivation method for commercial fruits that is characterized by is high-stemmed fruit trees of different ages and species. These meadows, established in the immediate vicinity of settlements, were historically used for the direct food provision of the local population. They are used commercially in many ways: on the one hand for fruit production and on the other hand as



hay meadows for the production of hay or grazing land for livestock. In some cases, these meadows are used for beekeeping or for fruit and vegetable gardens.

Orchard meadows are one of the most endangered biotopes in Central Europe. If one examines the biodiversity, orchard meadows accommodate typical old varieties of fruit species that have, over the years, become regional. These meadows are also species-rich in terms of fauna. Many Central European bird species are drawn to the orchard meadows as breeding grounds due to the available hollows and deadwood. Furthermore, insects – such as honeybees, which play an important role in the pollination of the fruit trees – can excellently settle here. Spiders can also often be found because of the favorable microclimate. In addition, amphibians and reptiles, such as the European tree frog (*Hyla arborea*) and slow worms (*Anguis fragilis*), can find a suitable habitat.

It is of special importance to the Fraport Environmental Fund to support the maintenance of orchard meadows in the region, given the biological quality and the culturally historical value.

6.3.5 Old wooded areas in Kinzigtal by Hanau

Old wooded areas are a key factor in the maintenance of the biological diversity in forests. They are comprised of old tree stands, for which the utilization was renounced until the beginning of the decomposition phase. Therewith, the black woodpecker (*Dryocopus martius*) and the succeeding hollow nesting birds, as well as other old and dead-

wood inhabitants will be supported. This area is an important component of nature conservation in the forests of Hesse and an important element for the regional biodiversity.

Today, 958 old wooded areas are found in the Hessian forest area with a total area of 1,708 hectares. Altogether, the old wooded areas take up 0.21% of the total Hessian wooded area. Merely 2.5% of the appropriate beech tree stands are declared to be old wood areas.

Given that the old wood areas have a unique biodiversity, their protection is of utmost importance for the Fraport Environmental Fund. In the course of a Hesse-wide survey of the existing old wood areas, relevant forest areas were examined with respect to condition, species spectrum, dead wood and tree hollows. The results showed that the old wooded area exhibits a habitat quality that cannot be found in cultivated forests in such a high local concentration. The existing stand of old wood areas should thus be preserved without exception as long as the crucial habitat qualities (e.g. old and dead wood tree hollows) exist. Forestal operations in old wood areas should remain out of bounds, also in the case of overbalanced trees in an event of storm.



6.3.6 Alluvial forests in the Kinzigtal by Hanau

A further priority for the Fraport Environmental Fund is the preservation of the Hessian alluvial forests, since their landscape and their nature is of high importance.

Alluvial forests grow along rivers and streams that are been flooded in periodic intervals. Near-natural riverside forests and wetland forest communities are characterized by their structural diversity. Its features include a high percentage of old and dead woods, different compositions of tree species, unique local conditions and a wide range of species. With regard to the species diversity, alluvial forest biotopes feature the largest array of birds in Central Europe.

Alluvial forests currently comprise only 0.3% of the total forested area in Hesse. Forests that are located

within the flood plain of streams are referred to as streamside forests. They often contain black alder (*Alnus glutinosa*) and European ash (*Fraxinus excelsior*), as well as an herb layer and they are most likely to be found on the valley floors of forested low mountain ranges. Wetland forest communities that are similar to alluvial forests are also found at sites with groundwater near to the surface.

Alluvial forests are one of the most endangered forest biotopes in Germany. Especially the drainage measures and the lowering of groundwater (e.g. for the production of drinking water) contribute to this situation. Alluvial forests are also often subject to pressure from settlement and have to give way to the construction of new buildings and industries.

Fraport represents a reliable partner for the Main-Kinzig research group from the Hessian Society for Ornithology and Nature Conservation (HGON) by financing the forest conservation for many years using the Fraport Environmental Funds. The main goal was to lastingly and enduringly protect and preserve the alluvial forests, thereby

making an important contribution to flood control. Until now, no concrete data existed on the streamside forests. Due to Fraport's financial support, HGON had the possibility to document the most important Hessian streamside forests.

The long-term concern of this project is to relinquish the Hessian near-natural wetland forests without



anthropogenic influence. Forestal, over-influenced alluvial and streamside forests should be converted into near-natural forests and will undergo a dynamic protection of natural processes in the future. Flowing waters with vegetation along the stream and near-natural water segments make important contributions to the preservation of plant and animal species; they act as integration elements in agriculturally influenced water meadows and settlement areas. The streamside meadows and their streamside forests have special structures that offer many adapted animal species a suitable habitat.

Intact streamside meadows have a major significance for bird species such as the white throated dipper (*Cinclus cinclus*), the grey wigtail (*Motacilla cinerea*), or the common kingfisher (*Alcedo atthis*). The streamside meadow, a semi-aquatic biotope, is a habitat for countless insects such as the beautiful demoiselle (*Calopteryx virgo*) or the large marsh grasshopper (*Stethophyma grossum*). The shallow waters rich in vegetation and the water banks are the ideal habitat for aquatic invertebrates. The streamside meadow is one of the

most important semi-aquatic habitat for amphibians such as the natterjack toad (*Bufo calamita*), the yellow-bellied toad (*Bombina variegata*) and the fire salamander (*Salamandra salamandra*). Moreover, fallen trees as well as old and dead woods provide an unique habitat for fungi, mosses and lichens, beetles and ants.

6.4 Registration and monitoring of species diversity

Regular ecological audits to determine the status quo and its changes

The Frankfurt Airport premises represent a suitable habitat for a considerable number of animal and plant species because the favorable conditions make a positive development in the respective populations possible. In collaboration with scientific institutions, Fraport has an on-site monitoring process to observe the specific species of flora and fauna. At

this point, one must differentiate between two approaches:

- Continual monitorings over many years at the airport, and
- Special monitorings made within the scope of new plans which also verify possible interferences with biodiversity.

A continual observation to regularly control the avifauna is carried out within the frame of the bird strike management. A further example is the use of honey bees to detect environmental encroachments on airport premises.

When new construction projects, such as hangars are planned, special monitorings are carried out during as well as after the execution the construction of the project.

6.4.1 Monitoring system for the detection of biodiversity – honey bees at Frankfurt Airport

Since spring 2006, eight honey bee colonies from the Institute for Apiology of the Polytechnic Society in Frankfurt were settled on the airport premises. Eight honey bee colonies were set up in the Niederursel and in the northern Taunus region as a source of reference.

In general, honey bees are very sensitive to pollutants, unfavorable conditions and disturbances in their environment. That is why they are a suitable indicator for encroachments in their environment.

The developments in the bee colonies are precisely tracked. In the year 2006, approximately 100 eggs from the queen bee were mapped and observed



until they developed into a mature bee pupa. The bee colonies at Frankfurt Airport are developing as successfully as the bees in Niederursel and in the northern Taunus region; their well-being is confirmed by their rich and qualitatively high-grade honey harvests, with an average of 19.9 kg per colony. The results of an examination from the Institute for Apiology in Celle show that the criteria for the honey provision were fulfilled and that the honey meets the high demands of the German Beekeeper's Association.

The honey shows an above average pollen spectrum and a high enzyme activity, which suggests a high natural finish. This does not only speak for the positive development of the bee colonies but also for the friendly conditions on the Fraport premises.

6.4.2 Ecological building inspection and monitoring by example of the A380 maintenance hangar

Ecological Building Monitoring

According to the Federal Nature Conservation Act, Fraport is obligated to avoid avertable encroachments on nature and landscape and to compensate for inevitable encroachments. The following measures were taken during the construction of the A380 maintenance hangar:

- Reptiles (sand lizards) were caught and resettled.
- Suitable old wood was cut out and placed outside of the construction area in the suitably sunny oak forest for the stag beetles.
- Additionally, formicaries were moved.

The transference of formicaries is not stipulated by the Federal Nature Conservation Act and the corresponding collateral clauses. However, it seemed sensible in terms of species conservation. The compensatory sites are located near sunny areas close to conifers; already shortly after the resettlement, lively activities in the formicary could be observed, deeming this measure a success.

Additionally, Fraport AG, in the interest of bat preservation, voluntarily checked all appropriate tree hollows to allow the potentially available bats a safe escape.

Before the erection of a fence, the construction premises were checked for hoofed animals. Not until construction had already started, a doe with fawns was noticed. After that, a large section of fence was left open to allow the animals to exit, which they finally did.

Small random findings are also not being disregarded during large construction projects. During the clearing of the land, the striking larva from a goat moth (*Cossus cossus*) was found and taken out of the construction site.

Measures were also taken with regard to the floristic species diversity. Several purebred wild European pear trees (*Pyrus pyraster*) were relocated. Numerous oak trees, which Fraport intends to keep, are still standing in the cleared areas.



Monitoring of the A380 Hangar

An encroachment of the environment in the vicinity due to the construction of the A380 hangar cannot be excluded. Hence, monitorings are being carried out in the Habitats Directive area "Mark- und Gundwald" and in the bird sanctuary "Mönchbruch" and in forests at communities of "Mörfelden, Walldorf as well as Groß Gerau". The goal of the evaluation is to make forecasts of the summation of the possible impacts as well as to efficiently implement obligations of the official approval.

The following efforts for the basic data compilation will be made during the monitoring of the Habitats Directive area "Mark- und Gundwald" according to the guidelines from the Hessian Service Centre for Agriculture, Horticulture and Nature Conservation (HDLGN):

- The acquisition of birds is carried out according to the standard procedures for the logging of breeding birds in Germany. These procedures suggest a territorial mapping of the value-determinant species for the formulation of the monitoring. It thereby deals with the species in Annex I of the EU Birds Directive as well as other species, such as the ones on the Red List. The compilation of the species enables a precise declaration of the qualitative value of the habitat structures and the quantitative changes in the symbiotic community. The monitoring of the avifauna is planned through the year 2016.

- In addition, the monitoring of bats will take place. By this, the long-term preservation of the Bechstein's Bat population in the "Mark- und Gundwald" will be supported, despite the interferences. Data based on population and habitat will be collected for the monitoring. Additionally, the animals will be marked so that the individual nursery roosts and changes in the activity area of the colonies can be determined.

- Stag beetles were collected in the cleared areas for the A380 maintenance hangar. The collection and estimation of the population are placed in the foreground. Additionally, the examinations comprise the inspections of the transferred tree stumps and of the areas surrounding the cleared area to possibly judge the side effects – especially the adverse effects of light – on the adjacent forested areas. As the previously mentioned monitoring, this documentation will be carried out up to the year 2016.

- Great crested newts (*Triturus cristatus*) will be documented by means of observation and fyke traps within the scope of the monitoring. The compilation and documentation will be carried out in three year intervals.

These results will be put together every two years in a cumulative report. Based on this foundation, a documentation is developed that includes an assessment and respectively potential changes and recommendations, as long as the measure appears necessary.

7 Biodiversity – Perspectives for Fraport Environmental Management

Our goal is to maintain sustainable economic activities. Hence our corporate actions equally support economic, social, and ecological criteria.

Our special involvement is to lastingly preserve the environment and with it its biodiversity.

With the future plans to expand the airport, we aim to go beyond the legal guidelines in terms of corporate activity and quality of life in the region. The

conservation of biodiversity represents a key factor and will be extensively and systematically funded. We are aware that a lasting biodiversity strategy cannot end at airport premises and that a long-term planning strategy is needed.

We will continue to be involved in the preservation of the environment and flora and fauna in the region; supported by the positive results from both accomplished and current projects.



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