

HABIT-CHANGE

Report about existing user difficulties

Output 3.2.1

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1. Introduction, objective and method

1.1. Introduction

In the project proposal for the Habit-Change Project the content of this output is described as "Report about existing user difficulties, knowledge about existing user difficulties due to climate change. Report about 40 pages".

Output 3.2.1 describes current problems in the Habit-Change investigation areas with special regard to the **use** of land from the user point of view. It is expected that the already existing problems and utilization conflicts within the protected areas are either exacerbated or, partly, mitigated by climate induced changes.

As defined for output 3.1.2 "Stakeholder dialogue" and the questionnaires sent to all investigation areas users are persons or institutions that are present inside the boundaries of protected areas that manage parts of the area and implement measures. They influence the condition of the protected area directly (e.g. management authorities of the protected area, land users like private landowners, farmers or tourists).

The analysis of answers in the questionnaires "Stakeholder dialogue" indicated that in some investigation areas the awareness of climate change under most users except management authorities is still limited. Problems and difficulties users and stakeholders had in the recent years have been hardly ever related to climate change. Seasonal anomalies in temperature or precipitation were usually seen as normal variations of weather conditions and not put into context of climate change. Therefore it is necessary to have a closer look at conflicts, problems and user difficulties that exist in the investigation areas without regard if they are caused by climate change or not. This information will be the basis for a valuation in which existing difficulties are related to the already observed change of climatic parameters.

In this report we assign the reported difficulties either to land use and land-use-change practices or to climate change, in some cases difficulties may be caused by both. Regarding the complex interactions between climates, land use, biotic and abiotic factors the assignment of conflicts to land use or climate change is paired with uncertainties. These uncertainties will be reduced in the advancements of the Habit-Change Project, as more information will be available and results from the hydrological modelling in action 4.4 will allow to related observed impacts and climatic pressures closer to each other.

Reported difficulties have to be subscribed to the different user groups and need to be valuated differentiated. Users in nature conservation like the management authorities of the protected areas have other objectives and tasks than users from agriculture or forestry. The reported difficulties

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always have to be interpreted in regard to the specific objectives of different users. This will be a task for further outputs in the advance of the project.

1.2. Objectives

Objectives of this output are:

- The assessment of existing difficulties of different user-groups
- The assignment of reported difficulties to climate change or land use and land-use-change practices
- The identification of pressures and drivers that conflict obtaining a favourable conservation status in protected habitats
- To provide an inventory of existing conflicts, problems and difficulties as a basis for the spatial decision support system (SDSS) in work package 5

Output 3.2.1 will contribute to preparing the implementation of climate-change adapted management plans (CAMPs) in work package 5, by identifying difficulties of important and influential land users in protected areas that should be subject of adapted management plans. To solve existing problems and difficulties relevant land users have to participate in the revision of management planning.

1.3. Classification with regard to other outputs:

The results presented in this report for output 3.2.1, the compilation of knowledge about already existing user difficulties in protected areas, are closely related to the other outputs of work package 3:

Output 3.1.2: report about climate-change related problems as seen by important stakeholders

Output 3.1.5: report on user requirements related to climate change (core output)

Output 3.2.2: list of climate-change induced and related pressures on protected areas

Output 3.1.2 provides a compilation of stakeholder positions, describes their perception of climate change und focuses on those phenomena that are considered problematic and are directly or indirectly connected with climate change. It also focuses on the identification of important stakeholders and their requirements as they have to be taken into consideration in the process of adapting the management plans for protected areas.



The core output 3.1.5 specifies the **requirements** land users ask to be met in the climate-change adaptation process. The adaptation and climate-protection measures by different kinds of land users can lead to massive changes in the use and development of protected areas. This output is based on the evaluation of the research to date as well on professional and political positions.

Output 3.2.2 then lists the research to date on climate-change induced and related pressures on protected areas and the most important results of the three former outputs, and it points out the characteristics of the problems, conflicts and user claims in the investigated areas.

All outputs mentioned so far are relevant for the preparation of output 3.3.1, in which the identified user requirements are the base for the evaluation of new climate-change related management strategies and practices.

1.4. Method

The report of existing user difficulties was based on data which was collected in the Habit-Change Project and already existing sources. The used questionnaires were filled in by the protected areas management authorities or their academic partners. In some cases the stakeholders contributed as well. The questionnaires were sent to the respondents by mail at the 30.04.2010, and were returned over the entire year 2010. For this output two questions were analysed:

A) Identification of land users and other stakeholders

B) Current user known problems in the protected area

Besides the basic information from the questionnaires management plans (if existing and available) were searched for passages about user difficulties or difficulties due to climate change. Also general information from the homepages of the Habit-Change Project and the investigated areas were used to describe the characteristics of the areas. Another important source was a summary of information that was produced as preparation for the project by the lead partner of the Habit-Change Project, the IOER. Further in some areas there was additional material available:

- Schaalsee Biosphere Reserve, Germany: existing study; Regionale Bewertung des Klimawandels und Entwicklung von Klimaschutz- und Anpassungsstrategien in der Biosphärenreservatsregion Schaalsee (2008) (regional assessement of climate-change impacts and strategies for mitigation and adaptation in Biosphere Reserve Schaalsee, 2008)
- Vessertal Thuringian Forest, Germany: journal article; Profft, I. and N. Frischbier (2008).
 "Möglichkeiten und Grenzen der Integration von Klimaszenarien in forstlichen Anpassungsstrategien an den Klimawandel." Forst und Holz 63(9): 22-27. (integration of climate scenarios in forest adaptation strategies: chances and limits)

- Biebrza National Park, Poland: existing study; Jadwiga Sienkiewicz and Apolonia Ostrowska IOS Warsaw: Habitat vulnerability to climate change in the Biebrza National Park (BNP)
- Bucegi Natural Park, Romania: Habit-Change Project: Output 3.2.2 Contribution to the Report
- Triglav National Park. Slovenia: Habit-Change Project: Action 3.2: Detection and description of pressures in Triglav National Park

In this output the terms difficulties and conflicts were distinguished by the number of involved participants. Difficulties occur mostly due to shortness of resources, natural catastrophes or unsuccessful actions. They are caused by external factors (e.g. climate) for one sector alone or are shared by different sectors but without interaction between them. The difference for conflicts is that two or more sectors are affected and affect each other. Conflicts occur because of different interests and goals of the sectors. This definition of terms is important for the approach for solutions. In order to solve the difficulties a change in strategy and action is needed for each sector individually. For solutions for conflicts stakeholder dialogues may be an efficient tool. This will be addressed more specifically in the conclusions.

Each of the following chapters starts with an introduction containing information of general characteristics and stakeholder groups. Secondly a description of difficulties due to land use (change), climate change or both is given and summarised in an overview-table. The tables shows additionally information by distinguishing affected sectors. The affected sectors are distinguished in: nature conservation, management authorities, water management, agriculture, forestry, local communities, hunting/fishing and tourism. This assessment is based on information from the questionnaires, literature and own opinion.





2. Existing user difficulties in habit change investigation areas

2.1. Rieserferner-Ahrn Nature Park, Italy

The Nature Park Rieserferner-Ahrn measures 313 km² and is characterised by the alpine landscapes and forest zones. The glaciers capture around 5 % of the area and are important water resources. The area is shaped by numerous streams, rivers, waterfalls and fens. The climate is moderately dry, heat favoured transitional. Extreme habitats for plants and animals can be found in the park. Agriculture in the park focuses mostly on livestock and is characterised by the contrast of intensification and abandonment. The nature park is commonly led by representatives of local communities, the department of forestry and agriculture, the farmers union and experts from conservation organisations. The group of land-users is represented by agriculture, forestry, tourism, fishery, water and land organisations and landowners.³

In this area user difficulties exist due to climate chance concerning the glaciers. In recent years mass movements, debris flows and damages to high altitude huts by ground ice melting repeatedly occurred.⁽¹⁾ Also the glacier retreat is seen as a risk to tourism because of rock fall and mudflow.⁽²⁾ The retreat of permafrost is also concerned as a difficulty due to climate change.^(1, 2) As another problem the shift of the natural vegetation zones upwards is mentioned. Species adapted to cold and wet growing conditions are especially negatively affected.⁽¹⁾ There are also difficulties due to changes in land use. This aspect may be distinguished into changes caused by tourism and changes caused by agriculture. In agricultural practice fertile areas have been used more intensively whereas areas that are difficult to reach and manage have been neglected or even abandoned.^(1, 2) On the one hand overgrazing and fertilisation may lead to changes in species composition, damage caused by erosion and nutrient input into waters and moor.⁽²⁾ On the other hand the abandoning of agricultural areas may result in a decrease of biodiversity or a loss of landscape diversity due to reforestation.^(1, 2) So far no difficulties due to water shortage have been observed but the modification of some creeks is seen problematic by the park management.⁽²⁾ The differences between the intensification (frequency of mowing and fertilisation, more cattle) and abandonment of alpine pastures and meadows are likely to increase in future.⁽¹⁾ Difficulties due to tourism are mostly the disturbance of the habitats by the high number of visitors. This includes trash, damages of trails, erosion and disturbance by ski lifts which cause limitations of raptor habitats.⁽²⁾ The road through the area increases the problem of disturbance by noise pollution and habitat fragmentation.⁽³⁾ The park management considers a new hydropower plant close to the border of the park as a possible threat to the required minimum amount of water in the streams.^(2, 3)



User difficulties	Affected sector	Due to climate change	Due to land use
Mass movements	Tourism, nature	Х	
	conservation, local		
	communities,		
	management		
	authorities		
Debris flows	Tourism, nature	Х	
	conservation		
Damages to high	Tourism, local	Х	
altitude huts by	communities		
ground ice melting			
Rock fall and mudflow	Tourism	Х	
Retreat of permafrost	Nature conservation	Х	
Shift of the natural	Nature conservation,	Х	
vegetation zone	forestry		
upwards			
Intensification of	Nature conservation		Х
agriculture			
Abandonment of	Nature conservation		Х
agricultural areas			
Abandonment of	Agriculture, nature		Х
water management	conservation		
Disturbance of habitats	Nature conservation		Х
Influence on water	Water management,		X
management by	nature conservation		
hydropower plant			

Table 1: Summary of user difficulties an their causes in Rieserferner-Ahrn Nature Park





2.2. Schaalsee Biosphere Reserve, Germany

The Schaalsee Biosphere Reserve has the size of 309 km² and represents the landscape type "baltic beech wood". In this reserve there is a high density of different biotopes and high species richness on a relatively small area. The landscape is characterised by beech and swamp forests, fens and numerous lakes, but also pastures, wetlands and fields. The lake Schaalsee is the core element of the biosphere reserve. The highly structured shoreline and large height differences in the soil profile are important structures.⁽⁴⁾ Stakeholders are divided in land user like agriculture, forestry and tourism and other stakeholders as the department for nature parks, for forestry and for water and energy management.⁽⁵⁾

In the Biosphere Reserve there are concerns about user difficulties due to land use and to climate change. On the one hand the land use difficulties are due to management of touristic activities as habitat disturbance by hiking or cycling routes. On the other hand the problems occur because of agriculture and resulting difficulties in water management. There are regulations of the water level of the Schaalsee that lead to a decrease of wetlands and to continuous change of the vegetation, peat mineralisation and nutrient intake into the lake. These difficulties may also occur because of climate change. Due to reforestation a loss of planes and open landscapes is expected. Agricultural practices lead to intensive use on one area and a lack of cultivation or abandonment on another area and therefore to changes in vegetation. Another aspect is that there are lengthening in re-naturation projects because of the administrative permission processes. Also conflicts occur about tree preservation between landowners and nature conservation.⁽⁵⁾ The biosphere reserve stakeholders are highly aware to difficulties induced by climate change. Extreme weather events (calamities) are expected. Also a subsequently lack of water in summer and erosion caused by heavy rain in winter are estimated. Due to that a dry fall of habitats, like sedimentation areas and bogs is expected. For the lake there is also a disturbance of the mixture of the aquifers expected. There are concerns about a loss of humus, displacing or leaching of macro-nutrients leading to a nutrient contamination of sensitive ecosystems and an increase of mineralisation of organic substance. Other difficulties may occur regarding biodiversity. It is anticipated that there will occur a loss of moisture loving species and stepping stones (kettle holes). But it is also said that there will be an overall change in species composition for animals and plants (immigration and loss of species). Also the warm climate may lead to a longer period of predation, if for example the fish is not protected by an ice barrier in winter. It will affect fishery by a decline of CO₂ and an increase of diseases. The changing climate will also lead to less resistant trees, a higher risk of forest fire, a higher risk of disease spreading and a higher risk of floods. The stakeholders are concerned about soil fertility, erosion and soil mud silting and compaction. The tourism will be affected by climate change, too. Because of the warmer climate the region will be more attractive for tourists and that will put the ecosystem under a higher pressure.^(5, 6)



Table 2: Summary of	Table 2: Summary of user difficulties an their causes in Schaalsee Biosphere Reserve			
User difficulties	Affected sector	Due to climate change	Due to land use	
Disturbance due to	Nature conservation,		х	
tourism	forestry, fishery			
Extensive land use	Water management,		X	
	nature conservation			
Lack of cultivation	Nature conservation		Х	
Water management	Agriculture, water	Х	Х	
	management, fishery,			
	nature conservation			
Decrease of wetlands	Nature conservation,	Х	Х	
	water management			
Peat mineralisation	Nature conservation	X	x	
Loss of planes	Forestry, nature		X	
	conservation			
Long administrative	All sectors		Х	
processes				
Land-use conflicts	Nature conservation.		X	
between landowners	local communities			
and nature	management			
conservation	authorities			
Lack of water	Agriculture, nature	x	x	
	conservation, fisherv			
Frosion	Nature conservation	X		
	agriculture			
Loss of humus		X		
	conservation			
Nutrient	Water management		X	
contamination	nature conservation			
containination	fishery			
Higher number of	All sectors	× ×		
	All Sectors	X		
Loss of moisture loving	Nature conservation	v		
coording	fichory	× ×		
species	Natura conconvotion	v		
Loss of steppingstones	Nature conservation	×		
Changes in species	Nature conservation,	X		
composition	fishery, forestry,			
	agriculture			
Damages due to	Forestry, nature	X		
drought or early frost	conservation,			
	agriculture			

Table 2: Summary of user difficulties an their causes in Schaalsee Biosphere Reserve





User difficulties	Affected sector	Due to climate change	Due to land use
Extreme floods	All sectors	X	
Higher risk of forest fires	Forestry, nature conservation, local communities	X	
Higher vulnerability of trees	Forestry, nature conservation	X	
Less productive agriculture	Agriculture	X	
Soil mud silting and compaction	Nature conservation, agriculture	x	
Peat bog degradation	Nature conservation	x	
Fish: lack of O ₂ and spreading of diseases	Fishery, nature conservation	X	
Higher predation rates	Fishery, nature conservation	X	
Disturbed mixture of aquifer	Water management, fishery, nature conservation	X	
Higher pressure from increasing tourism	Nature conservation	X	Х

2.3. Flusslandschaft Elbe-Brandenburg Biosphere Reserve, Germany

The Biosphere Reserve Flusslandschaft Elbe-Brandenburg consists of 530 km² and is characterised by the river Elbe. The area is only a part of the bigger nature reserve "Elbe river landscape". The natural floodplain is limited to a width of between one and three kilometres. In addition to the remaining alluvial plain, lowlands formed by peat, extensive areas of Talsande and dune systems exist.⁽⁷⁾ The extensive and relatively near-natural river basin landscape is still largely influenced by flood dynamics. Also there are extremely different habitat types on a relatively small space. Key habitats are aquatic habitats, intermittently wet sites, grassland sites with a great variation in nutrient supply and nutrient-poor, dry habitats. Due to the mosaic of diverse habitats the whole Biosphere Reserve contains unusually large populations of species with continental, atlantic, boreo-alpine and boreal distributions. The area is located in a transition zone between the sub-continental climate and the sub-oceanic-sub-atlantic climate region. The development of the region is under the (sometimes) conflicting priorities of nature protection and flood protection.⁽⁸⁾ The stakeholder are divided in land owner, forestry, tourism, fishery, hunting, water and soil management and shipping and in the

departments of environment, dike construction, water management and agriculture, tourism and conservation organisations.⁽⁹⁾

The questionnaire showed a high awareness of difficulties due to climate change. There are concerns about the changing rainfall distribution and therefore about the possible loss of fens and wetlands because of an inadequate water supply. Also insufficient water retaining and a dry fall of water bodies are expected. A loss of habitat due to extension of flood protection is estimated, too. It is pointed out that in agriculture and forestry a change in species composition will be needed and that in forestry the species are not site specific in present. A general change in species composition is expected, too. Additional an increase of pests and disease spreading organisms is estimated.⁽⁹⁾ By the stakeholders there are also difficulties due to land use seen. For example there is an impact of the renewable energies act expected. The law may lead to single crop farming, an intensification of water shortage and a loss of habitats.⁽⁹⁾

Table 3: Summary of user difficulties an their causes in Flusslandschaft Elbe-Brandenburg **Biosphere Reserve**

User difficulties	Affected sector	Due to climate change	Due to land use
Changing rainfall	All sectors	Х	
distribution			
Loss of fens and wetlands	Nature conservation	Х	
Insufficient water	Water management,	Х	
retaining and dry fall of	fishery, local		
water bodies	communities, forestry,		
	nature conservation		
Extension of flood	All sectors	Х	Х
protection			
Change in species	Agriculture, forestry,	Х	
composition	nature conservation		
Increase of pests and	Agriculture local	Х	
disease spreading	communities, forestry,		
organisms	nature conservation,		
	tourism		
Impacts of the	Agriculture, forestry,		Х
renewable energies act	nature conservation,		
(land use changes and	tourism		
intensification)			



2.4. Vessertal - Thuringian Forest Biosphere Reserve, Germany

The area of the Biosphere Reserve Vessertal - Thuringian Forest measures 170,8 km² and consists mainly of rural area. Only at the edge it is affected by the densely populated area Suhl-Zella-Mehlis. The Thuringian Forest, a mountain ridge area, is cut by a system of deep valleys. The landscape is dominated by forests. Small upland meadows are found only in stream valleys and in certain high areas. Runoff from ridge areas has led to the formation of small raised bogs and a dense network of streams.⁽¹⁰⁾ The Biosphere Reserve can be characterised as a almost completely continuous forest landscape, interrupted by agricultural land and by fens and mires, tall-perennial communities and succession areas. The agriculturally used land consists exclusively of grassland; no farming takes place within the reserve.⁽¹⁾ The area is located in the transition zone between Atlantic and continental climate but has as a massive crossbar also a strong influence on the climate.⁽¹¹⁾ The main tree species in Vessertal is spruce which was mostly planted for economic interests. It is distributed in the whole area with a broad range of soil and stand characteristics.⁽¹⁰⁾ The stakeholders are forestry, agriculture, hunting associations, water management, tourism, local communities, traffic and energy. This list must be supplemented by conservation organisations and numerous administrative authorities.⁽¹²⁾

The existing user difficulties are divided into problems due to land use and due to climate change. The tree species composition and forest structure (e.g. age) is due to anthropogenic intervention impoverished and therefore vulnerable to abiotic and biotic harmful events and pests.⁽¹³⁾ It is concerned that the high game population leads to a restraint of a natural forest with deciduous trees and rare species. The morphology of the area complicates the use of high technology for forest management and harvesting. Also the stakeholders are concerned about the loss of ability to preserve open areas if subsidies are cut.⁽¹²⁾ In regard to climate change financial difficulties are among expected problems. The risk of calamities and the resulting costs are a concern. Also management risks due to extreme weather events and mal adapted species are expected. Positive effects and developments may be caused by longer vegetation periods. Land use and climate change both threaten the species/habitat composition and the achievement of nature conservation objectives. The changes in vegetation pattern have a negative effects especially for species adapted to cold and wet conditions such as spruce.⁽¹⁰⁾ But it has to be taken into account that vascular plants are mostly dominated by the general condition of the forest and not by climate.⁽¹²⁾ Because of its topography, the Vessertal is part of an important catchment area and with its forests it prevents floods and high water levels. This aspects gains even more importance when extreme weather events like heavy rainfall will occur more often.⁽¹⁰⁾

User difficulties	Affected sector	Due to climate change	Due to land use
Tree species	Forestry, nature		Х
composition and forest	conservation		
structure			
Pests	Forestry, nature	Х	Х
	conservation		
Restraint of a natural	Forestry, nature		Х
forest	conservation		
Morphology	Forestry		Х
complicates the use of			
high technology			
Conservation of open	Nature conservation,		Х
areas	agriculture,		
	management		
	authorities		
Management risks	Forestry	x	
Change of species	Forestry, nature	Х	
composition	conservation		
Change of habitat	Nature conservation,	X	
composition	management		
	authorities		
Floods and high water	All sectors	X	X
levels			

Table 4:Summary of user difficulties an their causes in Vessertal - Thuringian Forest Biosphere
Reserve

2.5. Balaton Uplands National Park, Hungary

The National Park Balaton Uplands has a size of 570 km² and is separated into six areas (Pécsely Basin, Tihany Peninsula, Tapolca Basin, Keszthely Mountains, Sásd meadows, Kis-Balaton).⁽¹⁶⁾ The landscape varies between marshlands at Kis-Balaton, fluctuating dolomite-limestone surface of the Keszthelyi Hills and Pécselyi Basin, dense basalt hills in the Tapolca Basin and the surface of the Káli Basin dotted by volcanic craters, plateaus, stone seas and small lakes. The area is influenced by a mild, Mediterranean-like climate but in the mountains also extreme climatic and geological conditions occur and the flora and fauna is determined by these special ecological conditions.⁽¹⁴⁾ The area is used and managed by the National Park Directorate, departments of nature conservation, water management, agriculture and development, local governments, tourist associations, forestry, mining and fishing companies, hunting associations. Furthermore the park is influenced by landowners (farmers, vineyard owner), residents and touristic and sportive outdoor activities.⁽¹⁵⁾





In general the awareness of difficulties due to climate change is low in the National Park Balaton Uplands. Changes are mostly seen as recent weather occurrences that are not related to climate change. But the expressed difficulties may lead to an awareness of difficulties due to climate change. For example: on the one hand there experienced extremely wet years with negative effects in agriculture. On the other hand in recent dry years difficulties in agriculture increased and the spread of invasive weeds got stronger. Another problem exists in water management because high water levels threaten endangered species. Extreme weather events led to tree fall and remaining inland water caused damages in agriculture. The unpredictable summer season may cause a loss of income for those who live from tourism.⁽¹⁵⁾ At present in the warmer watercourses (near Thermal Lake Hévíz and Tapolca stream) many invasive species spread and in the forests growing up young trees suffer from shifts in precipitation patterns. In 2007 forests were dying of draught.⁽¹⁾ The park management and some stakeholders started to relate these difficulties to climate change. Therefore they expect difficulties due to climate change with water management (excess or lack of water) and expansion of invasive species. There is also a concern that wet habitats will become more sensitive and vulnerable.⁽¹⁵⁾

User difficulties	Affected sector	Due to climate change	Due to land use
Floods	Agriculture	X	
Drought	Agriculture	X	
Spread of invasive weed	Agriculture	X	
High water level	Nature conservation, water management	Х	
Tree fall	Agriculture, forestry	Х	
Continuously remaining inland water, insufficient drainage of agricultural land	Agriculture	X	
Loss of income	Tourism	X	
Excess or lack of water	Water management, agriculture, nature conservation	X	
Expansion of adventive and invasive species	Nature conservation, forestry	Х	

Table 5: Summary of user difficulties an their causes in Balaton Uplands National Park



User difficulties	Affected sector	Due to climate change	Due to land use
Wet habitats will become	Nature conservation,	Х	
more sensitive and	management		
vulnerable	authorities		

2.6. Fertö-Hansag National Park - Lake Neusiedl, Hungary, Austria

The Fertö-Hansag National Park-Lake Neusiedl with an estimated size of 300 km² is a cross-border project between Hungary and Austria. The lake Neusiedl is a part of both countries and connects both parks. The open water is surrounded by 180 km² reed belt, which is the largest closed monoculture of Phragmites area in Central-Europe. The reed area covers more than 50% of the whole lake surface and in the Hungarian part it is about 85 %.⁽¹⁾ Along the eastern and south-eastern shores of the lake lies a belt of saline and marsh meadows. Between the grassland habitats several shallow, partly saline lakes can be found.⁽¹⁶⁾ By rising and stabilising the water level in the lake reed growth was stopped. Formerly the water level has been highly astatic and fluctuating. In the last two centuries the lake almost or completely dried out on several occasions. The lake is one of the most turbid, opaque inland waters in Europe, with a low degree of transmission. Even light breezes whirl up mud and organic/inorganic substances. The lake is meso-(eutrophic).⁽¹⁾ The land users on the Hungarian side are: Hungarian State, North Transdanubian District Environment and Water Directorate, Fertő-Hanság National Park, Sailing association in Lake Fertő, Fertő-tavi Vízitelep in Fertőrákos, Fertő-tavi Nádgazdasági Zrt. (reed management public company) and other limited companies, enterprises and land owners. Other stakeholders are the North Transdanubian Regional Environmental Nature Conservation and Water Management Inspectorate, the Austrian-Hungarian Water Commission, local governments in the area, the Hungarian Counsil of the World Heritage "Fertő Area", associations in the area, tourism. Vine-yards owners and other farmers in the river basin area are also mentioned as important land users and stakeholders.⁽¹⁷⁾

In the National Park the concerns of stakeholders were not related to climate change. They detected difficulties with water quality especially in the reed belt where inner nutrient pollution, sedimentation and silting take place. Also a significant growth of algae and a spread/growth of the reed-belt that causes a decrease of the water surface were observed. Occasional low water level and difficulties of water supply of the reed-belt due to the silting and macrophytes-overgrowing of channels were observed. In rainy periods the "water-outlet" is a problem because it causes water problems near the Hanság-channel. In reed management difficulties with reed quality and the harvest due to a warmer climate are reported. These difficulties also effect recreation and therefore tourism.⁽¹⁷⁾ The described difficulties may be amplified by climate change. Stakeholders' interest in climate change and its impact on the National Park is expressed in questions like: "Will climate







change have an impact on water balance? Will climate change have an effect on the habitat diversity? Will a management of water level in Lake Neusiedl be necessary due to the climate change? Can Lake Neusiedl be preserved in the present form? If endowment is necessary, when it must be began? What kind of measures should we take? How will the eutrophication develop in respect of climate change?".⁽¹⁷⁾

User difficulties	Affected sector	Due to climate change	Due to land use
Inner nutrient	Water management,		Х
pollution	nature conservation		
Sedimentation	Water management,		Х
	nature conservation		
Silting	Water management,		Х
	nature conservation		
Growth of algae and a	Water management,		Х
spread/growth of the	nature conservation,		
reed-belt	management		
	authorities, tourism		
Low water level and	Water management,	Х	
difficulties of water	nature conservation		
supply			
"Water-outlet"	Water management	Х	
Reed quality and	Management		Х
harvest activities	authorities		

 Table 6:
 Summary of user difficulties an their causes in Fertö Hansag National Park - Lake

 Neusiedl
 Neusiedl

2.7. Körös-Maros National Park, Hungary

The National Park Körös-Maros measures 8000 km² and is situated at the Csanádi and Békési plateaus that stretch between the rivers Körös and Maros. In spite of the considerable agricultural development natural plant communities still exist, first of all, the loess fields. The region is covered by the meandering branches of river Körös and on the Dévaványai, Békési and Csanádi plains by spacious sodic steppes, remnants of wooded grasslands and marshlands as well as meadows, groves and wetlands. The flora and fauna is exclusive and includes numerous rare and protected species.⁽¹⁸⁾ The National Park is managed by Körös-Maros National Park directorate, nature conservation guards, regional environmental and water management directorate, water management association, and used by farmers and shepherds (hired by the National Park) and visitors of the study trail.⁽¹⁹⁾

In the National Park land use difficulties due to extreme weather events occurred in the recent two years. Those events were related to climate change. In 2009 the drought led to a lack in grass production and in water shortage. The National Park Management had to prevent the drying out of Szőrét swamps. In 2010 an extremely wet year led to difficulties in grazing and mowing practice, and physical barriers caused floods. Another problem was that the Kisgyanté area remained wet the whole summer and blocked mowing and accelerated succession. The concerns due to climate change by stakeholders include extremities in the amount and rate of rainfalls that result in excess water in some areas or their drying out after a lack of rainfall. Stakeholders and land users are worried about the expansion of invasive species stronger winds, warmer winters, hotter summers and droughts. It is expected that wet habitats will become more sensitive and vulnerable and their area will decrease. But even though these thoughts are sometimes expressed and land users start to adapt to the present situation neither regular conversation about climate change nor strategic planning for the entire National Park took place so far.⁽¹⁹⁾

User difficulties	Affected sector	Due to climate change	Due to land use
Droughts	Agriculture, water	Х	
	management, nature		
	conservation		
Floods	Agriculture, nature	Х	
	conservation,		
	management		
	authorities		
Invasive species	Nature conservation	Х	
Wet habitats will	Nature conservation,	Х	
become more sensitive	management		
and vulnerable, area	authorities		
decreases			

Table 7: Summary of user difficulties an their causes in Körös-Maros National Park





2.8. Biebrza National Park, Poland

The Biebrza National Park contains areas of forests, agriculture and wetlands by a size of 592 km². The area is shaped by the river Biebrza and the surrounding valley. The valley contains non-drained floodplains, marshes and fens and is surrounded by a post-glacial landscape with ice-pushed hills, moraines and outwash plains. The almost natural character of the Biebrza peat-lands is reflected in a regular pattern of peat-forming plant communities which run the length and breadth of the valley.⁽¹⁾ With an exception of the mountains, this area has a reputation for being the coldest region in Poland. The overlapping characteristics of continental and sub-boreal climate are due to the wide marshy areas that condense moisture on a very large scale and the valley's geological formation. Winds are commonly strong and have a west to southwestern direction. Due to the valleys high humidity wind storms and tornadoes are very rare.⁽²⁰⁾ The area is used by farmers, who are also involved in decision making for the management of areas inside the park. Stakeholders are the Regional Board of Melioration and Hydrotechnics, Towarzystwo Biebrzańskie (NGO), Polish Birds NGO, Polish Association of Bird Protection (NGO) and most important local authorities.⁽²²⁾

Most stakeholders so far didn't express any concerns about difficulties due to climate change. The reported difficulties were all related to land use. There were problems in agriculture caused by flooding events in summer. Other difficulties concerned the drainages. Most of ditches were not maintained properly and overgrown with shrubs and reeds so they do not function properly.⁽²²⁾ This overgrew results in the invasion of marshes by shrubs and trees.⁽²⁰⁾ There is a strong pressure from land users to maintain the ditches more frequent but this would cause an alteration of hydrological conditions of habitats. The farmers claim a need for financial support.⁽²²⁾ The loss of sedge and moss communities is accelerated as farmers stop mowing for hay production because it's not rewarding any more. Overall discontinuance of extensive agriculture at Biebrza marshes and changes in water conditions in the area caused scrub and forest vegetation succession upon non-forest ecosystems of peat land. This leads to transformations of soils, flora and fauna, which endangers protected biodiversity of marshy ecosystems. The marshy ecosystems were formed as a result of stable ground water inundation or yearly spring flooding. That is why building of canals and drainage ditch network caused drastic changes in water supply conditions and successively brought peat-forming processes to a stop and causing degradation of wetland ecosystems.⁽²⁰⁾

Other sources show that difficulties caused by climate change are expected. A general decrease in soil water saturation and a disruption of soil functions, such as biomass production and decomposition; storing, filtering and transforming nutrients, substances and water are expected. The overall hydrological balance in the river valley may be significantly impaired by rising temperatures and shifts in precipitation patterns, leading to the degradation and loss of wetland habitats. Other impacts of climatic changes will be the increased evapotranspiration from mire surfaces due to rising temperatures and the decreased water inflow to some of the mires. Warmer temperatures may accelerate the processes of organic matter mineralization and stop the peat producing processes

what leads to peat decay. This will result in rising CO₂ emissions and leaching of mineral elements, especially N, to groundwater. Changes in temperature regime are also likely to disturb vegetation phenology and affect the length of growing period. Also some sites located closer to the river bed may receive more intense flooding and/or more water logging due to a rise in groundwater table.⁽²¹⁾

User difficulties	Affected sector	Due to climate change	Due to land use
Flooding	Agriculture, nature	Х	
	conservation		
Loss of sedge and	Nature conservation		Х
moss communities			
Succession with shrubs	Nature conservation,		Х
and trees on marshes	forestry		
Decrease of	Nature conservation		Х
biodiversity			
Changes in water	Nature conservation,		Х
management	agriculture, water		
	management		
Decrease in soil water	Nature conservation	Х	Х
saturation and			
disruption of soil			
functions			
Hydrological balance	Water management,	Х	
will be impaired	nature conservation,		
	agriculture		
Increased	Nature conservation,	Х	
evapotranspiration	water management		
Peat decay	Nature conservation	X	
Increased CO ₂	Nature conservation	Х	
emission and leaching			
of mineral elements,			
N, to groundwater			
Shifts in vegetation	Nature conservation,	X	
phenology	forestry, agriculture		
Longer growing	Nature conservation,	X	
periods	forestry, agriculture		

 Table 8:
 Summary of user difficulties an their causes in Biebrza National Park





2.9. Bucegi Natural Park, Romania

Bucegi Natural Park has a size of 327 km² and contains numerous habitats as e.g. alpine and subalpine grasslands, tall forbs habitats, scrubs, rocks and screes habitats, chasmophyte vegetation on calcareous rocks, peat bogs, deciduous forests, coniferous forests and mixed deciduous and coniferous forests, rivers and lakes, communities of hydrophytes along the waterways. The park's biodiversity is formed by a temperate continental climate and located in an alpine zone.⁽⁷⁾ Landowners are churches, town councils, private persons and the Romanian state. The park area is used by tourism, forestry, research, Ministry of National Defence and Ministry of Administration, meteorological stations and power stations. The other stakeholders are the National Agency for Natural Protected areas and the Conservation of Biodiversity, National Forest Administration, Protected Areas Department, Territorial Forest Administration, Environmental Protection Agencies, local communities, Romanian Water National Agency, lifeguards, S.C. Teleferic Prahova S.A., School Inspectorates, Mountain Police Departments and environmental guards.⁽²⁴⁾

The group of stakeholder is very diverse and that is also true for their awareness and interest in difficulties due to land use or climate change. Difficulties due to land use involve mostly tourism, agriculture and construction management. Most stakeholders see tourism as the biggest threat at present. There are concerns about pollution and disturbances (erosions produced on the mountain sides, damage of the ecosystems and also of fauna and flora habitats) due to uncontrolled tourism. Another problem is the uncontrolled construction of houses and settlements in the Park's perimeter, Babele area. Overgrazing on pastures and meadows causes difficulties, too.⁽²³⁾ Climate change is expected to intensify and worsen already existing difficulties. Climate change is projected to bring more heavy rains, storms, torrents associated with erosion, ruptures and forest damages to the park. In recent years in springtime after a mild winter, a short period of time, with very cold temperatures, was observed. Frost damages on buds and reduced plant vitality were consequences.

The high temperatures during summer associated with draught and mild winter without or little snow are associated with the reduction of the habitats of the relict plants at high altitudes. This development advantages the increase of parasites and invasive species dispelling local and protected species. There are concerns about a shortened snow period that will especially affect tourism. Rising temperatures accelerate the snow melt and changes the water course debits. The increasing evaporation will amplify altering the seasonal water availability. There are concerns about soil degradation and overall geomorphological changes of the mountains side due to climate change. The expected higher frequency of extreme meteorological phenomena will disturb human activities and may endanger the lives of tourists. The impact of climate change on tourism will lead to financial problems and erode the economic basis of many inhabitants.

Climate change may lead to an intensification of the competition over land use and access to water sources, amplify existing conflicts, which will be triggered by demographic pressures. The effects of

already existing pressures on the habitats integrity and diversity, as air pollution, ozone, acid rainfalls, eutrophication, habitats fragmentation due to the anthropogenic activities, will be intensified by the cumulative effects of climate change.^(23, 24)

User difficulties	Affected sector	Due to climate change	Due to land use
Pollution and	Nature conservation,		Х
disturbances	management		
	authorities		
Uncontrolled	Nature conservation,		Х
constructions	management		
	authorities		
Overgrazing	Nature conservation		Х
Erosion	Nature conservation,	Х	Х
	management		
	authorities		
Forest damages	Forestry, nature	Х	
	conservation		
Reduction of plants	Forestry, nature	X	
vitality	conservation		
Reduction of the	Nature conservation	X	
habitats of the relict			
plants at high altitudes			
Increase of parasites	Nature conservation,	Х	
and invasive species	forestry		
Decrease of snow	Tourism	Х	
period			
Changes of water	Nature conservation,	Х	
course debits	water management		
Seasonal water	Nature conservation,	X	
availability	water management,		
	forestry, local		
	communities		
Soil degradation and	Nature conservation,	Х	
overall	management		
geomorphological	authorities		
changes			
Extreme	Tourism, management	X	
meteorological	authorities		
phenomena			
Intensification of	All sectors	X	
existing problems			

 Table 9:
 Summary of user difficulties an their causes in Bucegi Natural Park





2.10. Danube Delta Biosphere Reserve; Romania

The Danube Delta Biosphere Reserve measures 5800 km² and includes the bioregions steppe and pontic area. The main types of vegetation are marshy, aquatic, beach and sea dunes, forests flood lands, steppe and forest dunes. The region is characterised by a moderate – continental climate with pontic influences.^(1, 26) The Danube Delta Biosphere Reserve Administration, Romanian National Forests Administration, Romanian Waters Administration, Fishing and Hunting Administration, Tulcea County Council and local communities are land user of this area. Also private landowners who restrict access on their land are stakeholders.⁽²⁵⁾

The stakeholders express difficulties due to climate change, but there is no real awareness or considerations of the future. The water administration sees difficulties due to droughts. The channels are inaccessible because of sedimentation or low water levels. There are concerns by the reserve administration due to the decrease of reed beds. In forest areas dying trees are reported (especially alder and oak trees). Changes in groundwater levels, especially in spring have negative effects on humid to dry vegetation. The spreading of alien species causes difficulties, too. In fishery and hunting the decrease of species for hunting and fishing is a problem, but the possible reasons for the decline aren't known yet. The communes are concerned about ineffective agriculture and the spread of diseases and pest on crops.⁽²⁵⁾

Statistically the main problem for biodiversity in the Danube Delta is the loss of habitats triggered by the spreading of invasive species, forest clearing, dredging, over-grazing, ditching of marshes for mosquito control (isolate areas), mowing and erosion control activities. In present conditions, natural disturbances, such as fires, floods, bank-slides and tree falls also have impact on the protected habitats. It is unknown if climate change or anthropogenic pressures are more important for that development.⁽¹⁾ Additionally there are concerns about flood management under the pressure of climate change. The changing weather conditions may provoke hydrological alterations within the waters that affect its ecological and chemical status negatively.

On the one hand droughts lead to a decrease in water flow, a disconnection of wetlands and floodplains, changes in sediment transport, an increase in local pollution and insufficient groundwater recharge. The drought could also lead to difficulties in water supply for various sectors. On the other hand flood events increase the mobilisation of pollutants, affect the basic physical and chemical conditions and amplify land erosion with negative effects on aquatic organisms. Salt water intrusion in coastal areas may occur because of sea level rise and/or the lowering of river levels.⁽²⁷⁾



User difficulties	Affected sector	Due to climate change	Due to land use
Sedimentation or low water levels in channels	Water management	X	
Decrease of reed beds	Nature conservation	Х	
Forest dying	Forestry	Х	
Changes from humid	Forestry, nature	Х	
to dry vegetation	conversation		
Alien species	Forestry, nature conservation	X	
Decrease of species	Hunting, fishery		
Ineffective agriculture	Agriculture	Х	
Spread of diseases and	Agriculture	Х	
pest on crops			
Loss of habitats and biodiversity	Nature conservation	x	х
Flooding management	Water management,	Х	
	nature conservation		
Decrease in water flow	Water management,	X	
	nature conservation		
Disconnection of	Nature conservation	X	
wetlands and			
floodplains			
Changes in sediment	Nature conservation	Х	
transport			
Increase in local	Nature conservation	Х	
pollution			
Insufficient	Water management,	Х	
groundwater recharge	nature conservation		
Water supply	Water management,	X	
	nature conservation,		
	forestry, fishery,		
	agriculture		
Increased land erosion	Nature conservation	X	
influencing on aquatic			
populations			
Salt water intrusion in	Water management,	X	
coastal areas	nature conservation		

Table 10: Summary of user difficulties an their causes in Danube Delta Biosphere Reserve





2.11. Triglav National Park, Slovenia

The Triglav National Park has a size of 838 km² and is characterised as young folded ranges of the Eastern Julian Alpes with varied relief forms and pointed summits, steep rock faces and deeply carved glacier valleys. Two thirds of the park is covered with forests. In the past species adapted to the altitudinal conditions in this area and now form an unique set of species.⁽²⁸⁾ The land is used by farmers, forestry and local residents. Also the Ministry of Environment and Spatial Planning, of Agriculture and other ministries influence the area. Other stakeholders are regional development agencies, nature protection and environmental NGOs, media, local communities, research institutions, universities, private financiers and tourism.⁽²⁹⁾

The stakeholder awareness of difficulties due to climate change is according to the questionnaire "Stakeholder Dialogue" low. There were no concerns expressed. But it was clarified that the political interest and commitment depends on the economic situation. The participation of local inhabitants depends strongly on their motivation, which was low in the past. There is an overall concern that private interests are often more important than public interests.⁽²⁹⁾

Other sources identified difficulties due to land use and/or climate change. The spotted difficulties related to climate change are caused by rising temperatures. This leads to a decline and continuous retreat of the glacier, a shorter duration of snow cover during winter and a decreasing height of the snow layer. Greater risk of avalanches is expected, too. The observed change in vegetation structure and species composition (mainly in grassland and for snow-bed plant communities above the timberline) is related to increasing temperatures. Droughts cause a fall of water levels in water bodies which leads to higher water pollution, higher concentrations of organic matter and algae blooms. It is also expected that the demand for drinking water will increase. Difficulties caused by land use in the past may be intensified by climate change in the future. The peat bogs are negatively influenced by tourism, agriculture and forestry. Climate change will have an additional negative impact on peat bogs due to increasing air temperature and declining relative air humidity in the future. In forestry the observed loss of biodiversity is caused by the removal of dead and decomposing trees and woodland undergrowth. The expected increase in frequency and strength of extreme weather events caused by climate change may lead to severe forest destruction and an increase of pest insects. The invasion and expansion of invasive species was driven by anthropogenic influence in the past and will be boosted by climate change. Difficulties due to land use and changes in land use are related to tourism, agriculture and forestry. In agriculture changes in biodiversity due to abandonment or intensification of pastures are observed. An increase of pollution of springs is expected because of the development of mass - tourism. The use of fertilizer and pesticides in agricultural practice causes ground water pollutions.⁽³⁰⁾



Table 11: Summary of user difficulties an their causes in Triglav National Park			
User difficulties	Affected sector	Due to climate change	Due to land use
Decline and	Nature conservation	Х	
continuous retreat of			
the glacier	Tourism	v	
snow cover and	TOUTISH	^	
declining height of the			
snow laver			
Risk of avalanches	Tourism. local	Х	
	communities,		
	management		
	authorities		
Change in vegetation	Nature conservation,	Х	
structure and species	forestry		
composition			
Sinking of water level	Water management,	Х	
	nature conservation		
Higher water pollution	Water management,	X	
	nature conservation		
Higher concentrations	Water management	Х	
of organic matter			
Algae blooms	Water management,	X	
	nature conservation		
Demand of drinking water.	All sectors	X	
Negative influence of	Nature conservation	Х	Х
peat bogs			
Loss of biodiversity	Nature conservation,	X	Х
	forestry		
Forest destruction	Nature conservation,	X	
	forestry		
Increase of pest insects	Nature conservation,	X	
lumenta a sud	forestry	N N	N N
	forestry	X	X
species	lorestry		
Changes in the	Nature conservation		x
ecosystem			^
Pollution of springs	Nature conservation		X
i shaton or springs	water management		
Ground water	All sectors		X
pollution			
		1	

Table 11: Summary of user difficulties an their causes in Triglav National Park





2.12. Secovlje Salina Nature Park, Slovenia

The Secovlje Salina Nature Park measure 6,5 km² and is characterised by the diverse salina ecosystem and its habitat types that are associated with a characteristic biodiversity. The area is divided in different parts that are influences by the sea or the Dragonja River. The park is influenced by a mild sub – Mediterranean climate.^(31, 7) The areas stakeholders are the park management and the salt producing company (Soline d.o.o.) and their employees. Also the Ministry of Environment and the Ministry of Economy are important decision makers. The National Institute of Biology, University of Maribor and the Water Management Institute influence decisions concerning research.⁽³²⁾

In the Nature Park there are mostly concerns about the area close to the sea. Due to climate change it is expected that the sea level will rise and cause flooding. This may affect the biodiversity (breeding habitats, hallophytes, other fauna species, especially fish, reptile and insect populations) and salt production negatively. Also changes in hydrological dynamics of the Dragonja River are seen as a problem by water management. The increasing motorised access to the area causes excessive carbon output that is problematic for the park's biodiversity. The spreading of invasive species causes major concerns, too.⁽³²⁾

User difficulties	Affected sector	Due to climate change	Due to land use
Flooding	Nature conservation, salt production	x	
Changes in hydrological dynamics	Water management	X	
Excessive carbon output	Nature conservation, salt production		X
Invasive specie	Nature conservation, salt production	Х	Х

 Table 12:
 Summary of user difficulties an their causes in Secovije Salina Nature Park

2.13. Shatsk National Nature Park, Ukraine

Shatsk National Nature Park has a size of 489 km² and consists mostly of temperate and sub-polar broadleaf forests or woodlands and freshwater lakes.⁽³³⁾ Both natural and anthropogenic transformed ecosystems are present (natural forests, multiple-aged forests, untouched marshes and meliorated peat bogs, meadows, agricultural lands and meliorated marshes on the majority of the park area).⁽¹⁾ The Nature Park is used by the Park Administration, forestry, private landowners, farmers and tourism. The Ministry of Environment and Regional State Administration are important stakeholders, too.⁽³⁴⁾

There were no concerns due to climate change or land use expressed. Only the need for additional time and resources to carry out meetings and workshops for stakeholder dialogues was declared in the questionnaire.⁽³⁴⁾





3. Resume and conclusions

This report gives a compilation of knowledge about existing user difficulties in the investigation areas of the Habit-Change Project. This knowledge was mostly provided by the management authorities of the investigation areas and their scientific project partners. In some cases the perspective of important stakeholders was included. User difficulties indicate what problems the management authorities for the protected area have to achieve their objectives in nature conservation e.g. maintaining or reaching a favourable conservation status of protected habitats. User difficulties are also the problems other land users and stakeholders have in reaching their economic and social objectives.

This compilation is the basis for the identification of important drivers and pressures that may conflict the achievement or maintenance of a favourable conservation status (FCS) of protected habitats. Because of the still continuing discussion about standardised definitions for terms and categories of the DPSIR approach the collected difficulties and problems were not yet assigned to the categories "pressures" and "drivers". Which of the reported difficulties will be assigned as pressures or drivers that influence the conservation status of protected habitats may be decided after the project workshop in April 2011. The required information for the spatial decision support system will then be provided. We suggest that all impacts of climate change are considered "pressures" while impacts from land use and land-use change are considered "drivers". If difficulties or conflicts are due to drivers like land use or land-use change these conflicts may be solved by means of stakeholder dialogue. If the reported difficulties are due to climate change the adaptation of management objectives, strategies and measures would be the appropriate way to mitigate difficulties.

The reported existing user difficulties are highly depending on the habitat and on the stakeholder type and the objectives and interests (economic, ecologic or social) of stakeholders, respectively. Nevertheless the stakeholders and the management authorities of the investigation areas expressed some major difficulties that are similar in many areas (table 13). Rieserferner-Ahrn Nature Park and Triglav National Park share the problem of glacier retreat. The concerns about a shift of natural vegetation zones were expressed for the alpine landscapes in Rieserferner-Ahrn Nature Park and Bucegi Natural Park. In different areas there are concerns about a decrease of wetlands and an increasing vulnerability of protected habitats due to changing climates. In Triglav National Park this development was related to conflicts with tourism and changes in climate. Conflicts between nature conservation and tourism were reported repeating. The disturbance by tourists that visit the parks for recreation stands in conflict with nature conservation goals and area management. Conflicts also exist between agriculture and nature conservation. Intensification with an increased use of fertilisers and pesticides or overgrazing on the one hand and abandonment of agricultural areas due to economic inefficiency on the other hand has crucial impacts on biodiversity and the preservation of

protected habitats. In Vessertal – Thuringian Forest Biosphere Reserve the conflict between the economic uses of forests and the restrictions from nature conservation requirements are related to insufficient financial resources. Extreme weather events are expected to affect all areas but only some Parks/Reserves see this recurring difficulty that will become more common due to climate change.

Almost all areas (Rieserferner-Ahrn Nature Park, Schaalsee Biosphere Reserve, Flusslandschaft Elbe-Brandenburg Biosphere Reserve, Fertö-Hansag National Park, Biebrza National Park, Bucegi Natural Park, Danube Delta Biosphere Reserve, Triglav National Park, Secolvje Salina National Nature Park) had similar difficulties with water management. These problems differed in their characteristics and have a range from lack of water to excess of water. Besides these difficulties due to changes in water balance conflicts occurred between hydropower plants and nature conservation in Rieserferner-Ahrn Nature Park. In general water management is an important topic that the areas have to deal with. Changes in water management and in water balances due to rising temperatures and seasonal precipitation shifts are expected to have serious impacts on biodiversity. The investigation areas share their concerns about changes in species composition, the spreading of invasive species and the loss of protected species. Another widespread difficulty is the increasing spread of pests and disease that affects all sectors.

The analysis of the questionnaires revealed the different perspectives of involved stakeholders and land users. Depending on their special interests and objectives different stakeholders and land users reported specific problems in achieving their goals. Since most questionnaires were answered by the management authorities of the investigation areas many answers and reported problems reflect the difficulties in obtaining objectives in nature conservation. But especially in Biosphere Reserves the ecological, economical and social development are equally entitled goals of the management authorities. Conflicts between different sectors and tasks have been reported more often. This is particularly shown for Schaalsee Biosphere Reserve where many conflicts concerning administrative processes and different goals of land owners and nature conservation occurred.

For Bucegi Natural Park an extensive stakeholder dialogue with interviews was carried out to get an overview of perceptions, problems and conflicts as seen by important land users and stakeholders. For Bucegi Natural Park every stakeholder answered the questionnaire separately and the variety of interests and concerns could be displayed. Nature conservation organisations have a completely different view on difficulties and conflicts than local farmers or forestry because they pursue different and opposing goals. For many areas the questionnaires provided different perspectives on problems and conflicts than additional data that was analysed. This shows the importance stakeholder and user participation in the assessment of existing difficulties and problems in protected areas. The examples from Bucegi Natural Park and Biebrza National Park show that the intensification of stakeholder dialogues is a key aspect in the adaptation to climate change and





fundamental for the adaptation of management plans. Adaptation to climate change will only be successful when existing difficulties and problems of land users and stakeholders are considered and solved in the adaptation process. In most areas the adaptation to climate change depends on the support of land users and stakeholders who have to be persuaded to change their management practice. Stakeholder dialogues help to identify sector specific problems and conflicts between different sectors and objectives. As problems and conflicts will increase due to climate change stakeholder dialogues are a mean to solve existing and projected problems.

The filled questionnaires showed that the importance of stakeholder dialogues is seen differently in the Habit-Change investigation areas. It is expected that especially those investigation areas that plan to develop a climate-change adapted management plan (CAMP) will intensify stakeholder dialogues.

With this report information about the difficulties in obtaining nature conservation goals are available for all investigation areas that answered the questionnaire. For some areas additional information about difficulties of different land users and stakeholders who are more interested in economic and social development than in nature conservation are also available. The reported conflicts between stakeholders and land users from different sectors have to be dealt with and solved it adaptation to climate change shall be successful.

The following table gives an overview of the most common difficulties, the affected sectors and from which areas they are reported.



Table 13: Summary of main difficulties and conflicts				
Problem or difficulty	Affected and/or involved	Reported from these investigation		
	sector	areas		
Glacier retreat	Nature conservation	Rieserferner Ahrn Nature Park,		
		Triglav National Park		
Shift of vegetation zone	Nature conservation	Rieserferner Ahrn Nature Park,		
		Bucegi Natural Park		
Intensification and/or	Agriculture and nature	Rieserferner Ahrn National Park,		
abandonment of agricultural	conservation	Schaalsee Biosphere Reserve,		
land		Vessertal – Thuringian Forest		
		Biosphere Reserve, Bucegi Natural		
		Park		
Disturbance of species and	Nature conservation,	Rieserferner Ahrn Nature Park,		
habitats by tourism	tourism	Schaalsee Biosphere Reserve,		
		Triglav National Park, Bucegi		
		Natural Park		
Changes of species	Nature conservation,	Schaalsee Biosphere Reserve,		
composition and loss of	forestry, fishery/hunting	Biebrza National Park, Bucegi		
species		Natural Park, Danube Delta		
		Biosphere Reserve, Triglav National		
		Park, Secolvje Salina National		
		Nature Park, Flusslandschaft Elbe-		
		Brandenburg Biosphere Reserve,		
		Balaton Uplands National Park,		
		Vessertal – Thuringian Forest		
		Biosphere Reserve, Koros-Maros		
	No. 1	National Park		
Invasive species	Nature conservation,	Schaalsee Biosphere Reserve,		
	forestry, fishery/nunting	Biebrza National Park, Bucegi		
		Natural Park, Danube Delta		
		Biosphere Reserve, Triglav National		
		Natura Dark, Elussiandschaft Elba		
		Reandenburg Picenbore Reconve		
		Balaton Unlands National Bark		
		Vessertal – Thuringian Forest		
		Riosphere Reserve Körös-Maros		
		National Park		
Decrease of wetlands and	Nature conservation and	Schaalesee Biosphere Reserve,		
higher vulnerability of	tourism	Flusslandschaft Elbe-Brandenburg		
remaining wetlands		Biosphere Reserve, Triglav National		
-		Park, Balaton Uplands National		
		Park, Körös-Maros National Park		

Table 13: Summary of main difficulties and conflicts





Problem or difficulty	Affected and/or involved	Reported from these investigation
	sector	areas
Changes in water balance and water management (floods, draughts, drainage, pollution, changing ground water levels)	All sectors	Rieserferner Ahrn Nature Park, Schaalsee Biosphere Reserve, Flusslandschaft Elbe-Brandenburg Biosphere Reserve, Fertö Hansag National Park, Biebrza National Park, Bucegi Natural Park, Danube Delta Biosphere Reserve, Triglav National Park, Secolvje Salina National Nature Park
Extreme weather events	Water management, nature conservation, agriculture, forestry, local communities	In all areas
Increase of pests and diseases	All sectors	Flusslandschaft Elbe-Brandenburg Biosphere Reserve, Vessertal – Thuringian Forest Biosphere Reserve, Balaton Uplands National Park, Bucegi Natural Park, Danube Delta Biosphere Reserve, Triglav National Park

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