Report No. 44

Ramsar Advisory Mission

Shumava Mires Ramsar Site, Czech Republic

5-8 June 2001

Report prepared by Hans Joosten, with additions by Tobias Salathe,
based on the comments received on an earlier version by the Czech and Slovak mission participants.

For ease of e-mailing this document, accents of site and personal names have been omitted.
The spelling of "Sumava" has been adapted to "Shumava" to assure correct English pronunciation.

Introduction

1. The Ramsar Convention gives special attention to assisting Contracting Parties in the management and conservation of listed sites whose ecological character is changing or likely to change as a result of technological development, pollution or other human interference. This is carried out through the Ramsar Advisory Missions (RAM), a technical assistance mechanism formally adopted by Recommendation 4.7 of the 1990 Conference of the Parties (formerly known as the Monitoring Procedure and the Management Guidance Procedure).

2. On 6 June 2000, the Deputy Director of the Department of Nature Protection of the Ministry of the Environment, the Ramsar Administrative Authority of the Czech Republic, asked the Ramsar Bureau, based on an unanimous decision by the Czech Ramsar Committee on 9 December 1999, to consider carrying out an independent Ramsar Advisory Mission to provide guidance on how best to deal with specific management problems related to the recent outbreaks of bark beetle populations.

3. On 29 September 2000, the Director of the Department of Nature Protection of the Ministry of the Environment provided the Ramsar Bureau with additional information and a proposal for the composition of the Ramsar Advisory Mission. Taking into account the winter snow cover of the Shumava mountains, he proposed to postpone the mission to the first week of June 2001 and expressed the wish that the Ramsar Advisory Mission would help to evaluate current management measures for forests damaged by bark beetle outbreaks and its impact on the wetland ecosystems.

The Shumava Mires

4. The Shumava Mires Ramsar Site comprises a complex of disjunct peatlands, including three core areas in the granitic Shumava mountains, providing unique ecosystem islands. The Ramsar Site includes high plateau raised bogs, valley bogs, coniferous forest and riparian wetlands of the upper Vltava (Moldavia) river. Bogs on the high plateaus show characteristics of the forest-tundra with low-growing bog pines, open areas, shrub and grass vegetation. Treeless areas are covered by minerotrophic mires with stands of short sedges. The bogs are of considerable entomological and botanical interest, supporting various endemic and rare species, including relict populations of 25 species of butterflies, dragonflies, beetles, capercaillie, black grouse and northern birch. Both types of raised bogs (high plateau and valley bogs) are often surrounded by waterlogged spruce (*Picea abies*) forests. Some areas of the Ramsar Site (e.g. Modravska slat) include also planted,

non-waterlogged spruce forests. Some nature trails exist, although most of the Ramsar Site is closed for public access.

5. Outside the wetlands, especially at higher altitudes, the legacy of centuries of forestry interventions remains in the form of monospecific spruce plantations, or plantations with artificial species composition and patch dynamics. The natural vegetation originally consisted of mixed, beech (*Fagus sylvatica*) or fir-dominated (*Abies alba*) forests. Patches of such forests can still be found, particularly in the adjacent Bayerischer Wald National Park.

6. The Shumava Mires Ramsar Site is part of the Shumava (Bohemian Forest) National Park, established in 1991. Within the National Park, discrete stands of old-growth and natural forests survived. Together with a number of bogs and mires, these "close-to-natural ecosystems" (cited from "Management Plan of the Shumava National Park") were designated as Zone I ("*strictly natural areas*") of the National Park. The many different Zone I patches are surrounded by a large heterogeneous, temporarily managed, transition Zone II ("*areas to be steered towards 'natural'*"), intended eventually to be included in large parts into Zone I. Zone III ("*zone of development*") includes areas with ecosystems that are influenced by human activities, as well as built-up areas. A large Protected Landscape Area surrounds the National Park. Both together form a Biosphere Reserve, managed jointly by a single authority.

7. In the early nineties, wind squalls felled important number of trees in the adjacent Bayerischer Wald National Park (Bavaria, Germany). This situation favoured the development of massive bark beetle (*Ips typographus*) outbreaks, originating in an area of mountain spruce forests. The area is isolated from lower altitudes by a contiguous complex of mixed forests, acting as a buffer zone against the spread of bark beetles. Up to now, spruce trees have died over an area of approximately 3,700 ha, mainly inside the Bayerischer Wald National Park Core Area. The Bavarian Park authorities apply in the continuous Core Area (Zone I of the old part of the National Park) a strict no-intervention policy, to facilitate the spontaneous development of natural forest communities.

8. Bark beetles spreading from the Core Area of Bayerischer Wald National Park to the Czech side caused a similar massive dying of spruce forests over an area of 1,600 ha, mainly in the higher parts of Shumava National Park. In some Zone I areas, the Shumava National Park authorities combat bark beetles with sanitation methods and individual cutting of infested trees. A specific status has been accorded to a so-called "*no-intervention area*" along the state border with Germany, as a response to the fact that it was not possible to effectively reduce the bark beetle outbreak using the sanitation methods in this area. Presently, the no-intervention area covers 479 ha in Zone I, and 847 ha in Zone II.

Issues considered by the RAM (as spelt out in the Terms of Reference)

9. The occurrence of bark **beetle population outbreaks** in the Bohemian Forest, its frequencies and extent (historical and recent data), and its ecological consequences (dying of forests, spread of bark beetle populations and other parasites and their respective predators, etc.).

10. The **environmental impacts** of different methods **of bark beetle control**, including the absence of control measures, on forest structure and development, microclimate (clear

cuttings), hydrology and soil ecology (through drainage and compacting with heavy machinery to remove affected trees), and biodiversity (through altering the forest extent and structure, the hydrology of peat bogs, etc.).

11. The **integrated forest management** in the Bohemian Forest, including policies for timber cutting, clear cuts, plantations, no/limited human intervention old-growth stands, drainage and other landscaping measures, and their impacts on bark beetle populations and rare, endemic, threatened and relict populations of invertebrates (butterflies, dragonflies, beetles, etc.), birds and plants representing specific biodiversity values of the Shumava National Park and surrounding protected areas in the Czech Republic and Bavaria.

12. The need for **transboundary management**, according to the Ramsar guidelines for international cooperation (Ramsar Handbook 9), including coordinated bark beetle population management measures on both the Czech and German sides.

13. Based on paragraphs 9-12, preparing a series of concrete **recommendations** for management measures, evaluation and monitoring procedures (of the management measures applied) and procedures for transboundary data and information exchange, coordination and cooperation.

Bark beetle ecology and management strategies in the Bohemian Forest

14. Bark beetle outbreaks are an element of natural biodiversity in central European montane spruce forests. It is not a question of whether these natural phenomena will happen, but when, where, and to what extent. Bark beetle outbreaks generally follow wind squall damage and are stimulated by climatic and other environmental factors that weaken the spruce stands. In case of massive outbreaks, also healthy spruce stands are affected.

15. No information is available on the frequency, intensity, duration, and extent of bark beetle outbreaks in central European montane spruce forests under conditions without human impact. Historical accounts of massive outbreaks in the Bohemian Forest probably reflect situations in which human impact and exploitation had already considerably modified the composition, structure, and resilience of the forests. High-resolution paleo-ecological research into pre-human patch-dynamics of these forests is still lacking, although the mires of the Bohemian Forest could provide an excellent opportunity for such research, as detailed information on bark beetle outbreaks is available since the early 19th century.

16. Under the current conditions of human-induced environmental stress and the presence of planted, non-local spruce ecotypes in the National Park, the vulnerability of the montane spruce stands for bark beetle attacks is higher than under natural conditions, also in natural spruce stands.

17. The replacement of mixed forests by monotonous stands of spruce on lower altitudes of the Bohemian Forest in the last centuries has considerably increased the area susceptible to large-scale bark beetle outbreaks and has removed natural barriers against the spread of bark beetle. The replacement has furthermore decreased the on-site availability of diaspores of other tree species.

18. The presence of huge commercial spruce stands beyond the borders of the Shumava National Park necessitates the prevention of massive expansions of bark beetle to these areas and raises the question of the nature and extent of such prevention measures.

19. The management policy of both National Park authorities (Shumava and Bayerischer Wald) is, among others, directed by:
    - a **conservation goal** to steer the human-influenced ecosystems towards more natural conditions, eventually leading to *no-intervention* and *self-regulation* (for a definition of the terms cf. box) in a substantial part of the National Parks;
    - and the **socio-economic constraints** to prevent unacceptable economic damage to the commercial forests outside the National Parks.

20. To honour the conservation goal, both the Shumava and the Bayerischer Wald National Park have installed "*no-intervention zones*" in which bark beetles are not controlled, applying a strategy of "*spontaneous transformation*". It is expected that the spontaneous dynamics of tree dying, followed by colonisation and succession of new trees, will lead in these zones to ecosystems that better reflect natural conditions.

21. The bark beetle no-intervention zone covers 9,800 ha in the Bayerischer Wald National Park and, directly adjacent to that area, 1,326 ha in the Shumava National Park. On the Bavarian side, this zone equals the Core Area of the old part of the National Park. On the Czech side, the bark beetle no-intervention area covers parts of both, Zone I and Zone II sites (cf. paragraph 8), and includes part of the Ramsar Site areas.

22. With respect to its conservation goal, the Shumava National Park applies an additional management strategy of "*guided transformation*". Under this strategy, tree species should be planted that belong to the assumed original forest composition, but which are insufficiently available in the regeneration potential (diaspore bank) at given sites. Such planting does not take place in the "no-intervention area" of Zone I, and is the only forestry activity taking place in "no-intervention areas" of Zone II. Planted trees, except spruce, are temporarily protected against game damage.

23. It is impossible to assess *ex ante* which management strategy is providing more rapid results, *spontaneous* or *guided transformation*. Currently available conclusions, based on *ex post* assessments of site-specific results in the Bohemian Forest area and elsewhere, are still scarce and contradicting. Scientific experts may judge the attainability or consistency of stated management aims, but may not decide on which aims to choose. The choice of conservation and management aims, although it should be based on best available science and technology, belongs to the realm of society. A participatory process, involving all stakeholders, and taking their concerns into account, should construct a consensus to provide a sound information basis for elected people that make political decisions, and their administrative apparatus that will implement the decisions.

24. Conflicting opinions on the best management strategy for Shumava National Park relate to:
    - different conceptions on what *nature* is, and on what the *aims* of nature conservation should be (cf. box): e.g. should spontaneity prevail or a specific ecosystem type;
    - different interpretations of the terms (and the relation between them) *self-regulating*, *spontaneous*, *natural*, *original*, and *typical* (cf. box);
    - differing precedences (temporal goals) if development towards the aimed biodiversity should be enhanced by *guided transformation*, or be left to *spontaneous transformation*;
    - different opinions about the fact that *spontaneous transformation* may even be more rapid than *guided transformation*, under specific circumstances;

- differing preferences (spatial goals) if spontaneity should be maximised in the core areas, or be optimised in both, core areas and buffer zones?

These issues are often not spelt out clearly; and furthermore, they are inter-related in a complex, and dialectic, way.

25. Conservation goals are formulated within the framework of constantly progressing best-available scientific understanding and management know-how. In contrast to earlier scientific "stability theories", conservation ecology now increasingly recognises the *de facto* non-equilibrium status of natural ecosystems, and the importance of disturbance ("patch dynamics") as a driving factor in natural ecosystem functioning. Management decisions, however, are not only guided by the latest insights of science and technology, but have also to consider public and political perceptions, attitudes, and aspirations.

26. The Management Plan of the Shumava National Park, adopted in November 2000, contains a clear **Mission Statement**: "*To conserve and improve its natural environment, especially to maintain or restore the self-regulatory functions of natural systems, to strictly protect wildlife, and to maintain the typical appearance of the landscape; to fulfil scientific and educational goals, as well as to promote appropriate tourism and recreation within the National Park.*" (citation of the English translation provided to the RAM by the Park authorities).

27. Neither from this *Purpose of the National Park* (Management Plan, paragraph 1.1.2), nor from its stated *Principal Object of Conservation* (Management Plan, paragraph 1.1.3), it has obligatory to be inferred that a major part of the National Park (Zone I) needs to be the subject of an unconditional no-intervention policy. This does, however, not deny the fact that several National Parks <u>do</u> apply a strict no-intervention policy, and that strict no-intervention, whenever possible, is <u>preferable</u> from a nature conservation point of view (cf. box).

28. The discussion on forest management in the Shumava National Park has been initiated by differing specific priority aims that different people impose upon the general purpose of the National Park. The ensuing differing views about acceptable management tools have been nurtured by the rapidly following changes in the zonation and management concepts of the Shumava National Park in the past, and by the use of confusing terminology, notably the existence of so-called "no-intervention zones" in which human interventions do occur.

29. Special attention should therefore be given to clarify those sources of potential confusion, notably concerning the terms *self-regulatory functions*, *natural systems*, *strictly protected wildlife*, and *typical appearance of the landscape* of the Mission Statement.

30. The new **Management Plan** of the Shumava National Park provides a useful structure and essential elements for the sustainable management of the Shumava area and its natural resources. The National Park authorities have to be commended for the elaboration of this document, and are encouraged to further develop its operational objectives and procedures in a consistent manner and in more detail, in order to prevent futile discussions, and to stimulate fruitful exchanges of new ideas and experiences.

The *nature* of nature

With *nature* and *natural* is often meant a state free of human influence. As everything is connected with everything else, however, a "world apart from man" has never existed since "Homo sapiens" appeared on Earth. For nature conservation purposes it is useful to define *nature* in relation to *culture* (natural *vs* artificial). Culture is then each deliberate (conscious) act or thought of human beings and its results. Nature is everything that has originated, or is originating spontaneously. Nature includes spontaneous development (the natural *processes*, e.g. growth, succession, and evolution) and the results of spontaneous development (the natural *patterns* and *systems*, e.g. rocks, organisms, species, communities, and mires). Nature (i.e. spontaneity and its products) can be observed everywhere, also in environments created by man, but not everything is nature. Patterns, processes, and systems are only natural as far as they do not result from deliberate human action.

To do - *or not to be,* that is the question

Nature conservation therefore seeks the facilitation of spontaneous processes and the conservation of their results. The crucial question is, which *means* are allowed to reach which *ends*? Because in nature conservation, the means are an implicit part of the ends: each deliberate act increases the artificiality of the result, and therefore conflicts with the essence of nature's spontaneity. The current human population density on Earth no longer leaves enough space to conserve all natural biodiversity by the only means of spontaneous processes (or *doing nothing*). Consequently, it is believed that human intervention is needed to preserve or restore particular ecosystems and populations. The gain of them being conserved or restored involves, however, a loss in naturalness (or no-intervention). The essence of nature conservation requires natural biodiversity to be conserved by doing *as little as possible*. How to balance optimally between naturalness and biodiversity is not only a matter of scientific expertise, but principally a question of aims and choices.

Spontaneous *vs* self-regulating, original *or* typical

Much confusion in nature conservation arises from the words *natural*, *spontaneous*, *self-regulating*, *original*, and *typical* that are often inaccurately used as synonyms.

Self-regulating relates to internal abilities of a system, by which externally or internally induced changes in its state or functions give rise to a reaction which restores the system to its "original" state. Spontaneous developments *may* lead to self-regulating systems (stabilised by negative feedback mechanisms) but also to changing systems (enabled by positive feedback mechanisms, cf. succession, evolution etc.). Self-regulation is moreover not restricted to spontaneous processes: a refrigerator is self-regulating (with respect to its temperature), but not natural.

Original relates to origin or beginning. As natural phenomena are part of a continuous evolutionary process, no a priori beginning exist (except for a Big Bang?). What is meant with *original* must therefore always be stated explicitly.

Typical means exhibiting the qualities or characteristics that identify a group or kind or category. What is typical, depends on the typology. As "there may be as many classifications of any series of natural, or of other, bodies, as they have properties or relations to one another, or to other things; or, again, as there are modes in which they may be regarded by the mind..." (T.H. Huxley, 1869), every typology is subjective and depends on specific aims, interests, and paradigms.

Mires, trees, and bark beetles

31. The mires of the Shumava National Park and Ramsar Site are amongst the best existing examples of montane mires in central Europe.

32. The management authority of the Shumava National Park and Protected Landscape Area is aware of the important values of these mires and of their responsibility for the sustainable conservation and careful management of these sites. As a result, most of the mires are therefore in excellent condition.

33. The relations between mires and forests/trees are highly complex. From a hydrological point of view these relations include, amongst others:
    - larger interception of precipitation by tree canopies compared to treeless areas, leading to less rain water reaching the soil surface;
    - condensation and capture of water droplets from clouds or mist (horizontal precipitation) by trees, leading to more atmospheric water reaching the soil surface;
    - generally larger evapotranspiration from trees, leading to more water being removed from the soil, but also – because of decreasing atmospheric water demand (advection) - to less evapotranspiration from neighbouring sites;
    - shading of trees, leading to less evapotranspiration from shaded soil vegetation;
    - wind protection offered by trees, leading to less evapotranspiration from lee-side or enclosed vegetation;
    - higher external load of trees growing on a mire, leading to smaller pore volumes, lower hydraulic conductivity, and smaller hydraulic storage coefficients of peat.

    Next to quantitative hydrological changes, also shifts in water quality may result from changing forest cover.

34. The cumulative effects of all these factors differ with tree density, geographic altitude and exposition, distance between forest and mire, and mire type (cf. table below). Furthermore, they change in time. It is therefore difficult to predict generalised statements about the direction, magnitude, and dynamics of the hydrological changes.

Less trees leading to:	Effects on peat accumulation (+/-) of		
	Mires on site	**Adjacent mires** (via surface processes)	**Other mires** (via groundwater)
decreasing interception	decreasing water supply (+)	increasing water supply (+) increasing erosion (-)	increasing water supply (+)
decreasing horizontal precipitation	decreasing water supply (-)	decreasing water supply (-)	decreasing water supply (-)
decreasing evapotranspiration	decreasing water losses (+)	increasing advective water losses (-)	increasing water supply (+)
decreasing shading	increasing evapotranspiration (-)	increasing evapotranspiration (-)	not relevant
increasing wind velocity	increasing evapotranspiration (-)	increasing evapotranspiration (-)	not relevant
decreasing external load	increasing hydrol. conductivity (-) increasing storage coefficient (+)	not relevant	not relevant

35. Hydrological changes resulting from tree dying or felling will undoubtedly take place and will - because of the strong hydrological dependency of mires - lead to changes in the mires. The effects of *spontaneous* dead trees are expected to be somewhat smaller than those of clear cuttings, because dead trees retain their passive hydrological functions to some extent.

36. As a result of the generally good condition of the Shumava mires and the considerable capacity for self-regulation of the older, more valuable mires, the hydrological changes resulting from tree dying or felling are not expected to damage the fundamental character of the mires.

37. Peat soils play an important role in mire ecosystem functioning and are important as paleo-ecological archives and stores of carbon. They are vulnerable to erosion and compaction (e.g. resulting from using forestry machinery and transport of wood) which may seriously impact mire hydrology.

38. Spruce stands growing on mires, and in their lagg zones, are often less susceptible to bark beetle attacks as a result of their more diverse structure and age composition, their adaptation to more open conditions, the occurrence of local ecotypes, the better water supply, the prevalence of cooler meso-climatic conditions ("Kaltluftschlenken"), and because the mire itself provides a beetle-hostile buffer zone.

39. For all these reasons, peatlands and their lagg zones are ideally suited for rapid inclusion into *no-intervention zones* as a high priority. Management interventions should be restricted to restoration measures, as outlined in chapter 4.2.2.1 of the Management Plan.

Transboundary and international aspects

40. The presence of two major National Parks on both sides of the Czech-German border, with similar conservation goals and management challenges, necessitates intensive transboundary cooperation and exchange of information. This is substantially facilitated since the lifting of the geopolitical obstacles during the "Cold War", and the physical removal of the "Iron Curtain" that literally cut the common ecosystem into two, until only ten years ago.

41. Such cooperation is especially required, as mutually incompatible management strategies (e.g. intervention *vs* no-intervention) may – due to the intense spatial and functional relations between both areas - prevent each party from reaching its conservation goals in the most effective way.

42. Currently, both National Parks apply different management approaches with regard to the zoning of the no-intervention areas and the intervention policy after bark beetle outbreaks, partly due to different ecological conditions and a differing socio-economic context on each side of the state border. As, however, both Parks share the aim of a conservation management towards more natural ecosystems, regular exchange of experience and insights followed by coordinated and cooperative actions, seem to provide an efficient management approach for the future.

43. The Memorandum of Cooperation between the National Parks of Shumava and the Bavarian Forest (signed on 31 August 1999), mentioned in the Management Plan of the

Shumava National Park (adopted in November 2000), could facilitate the necessary international cooperation at all levels.

Conclusions

44. The Ramsar Bureau highly appreciates the professional and detailed management approach of the Shumava National Park authorities for the conservation of the important hydrological and biodiversity values of the Ramsar Site areas.

45. The Ramsar Bureau considers the "Management Plan of the Shumava National Park for the period 2001-2010" to be a good start, with regards to the spirit of integrated management and international cooperation, as detailed in the document. It wishes these efforts to be developed even further (cf. paragraph 30) and translated rapidly into concrete actions on the ground.

46. The Ramsar Bureau acknowledges that the Shumava Mires (forming a Ramsar Site that covers 10,226 ha, composed of 31 different peatlands within the Shumava National Park) are representing some of the most valuable natural ecosystems of the Shumava National Park and Protected Landscape Area in terms of their functions for hydrology and biodiversity.

Recommendations

The Ramsar Bureau would like to recommend the following concrete actions:

1. **Implementation of the Management Plan objectives:** The authorities of the Shumava National Park and Protected Landscape Area should progress with the implementation of the management plan objectives for the area in a cooperative way, together with all the stakeholders concerned, including NGOs, and involving relevant international experts and partners.

2. **Attain the spatial zoning objectives**: As specified in chapter 4.1 of the Management Plan, the zonation of the National Park area should correspond by the deadline of the year 2030 to the declared objectives of a minimum of 50 per cent for Zone I (natural zone), up to 40 per cent for Zone II (transitional towards permanent natural zone) and up to10 per cent for Zone III (development zone).

3. **Clarify and simplify the National Park zonation**: Zone I should be comprised of a few large individual areas only, as stated in the Management Plan: "The current fragments of Zone I will be used as nuclei for a future, larger and consolidated Zone I.". Areas with "Type I, no-intervention management" of Zone I should be clearly delineated as large, continuous areas, and on a permanent basis.

4. **The Ramsar Site remains a no-intervention area**: Particular emphasis should be given to the core areas of the National Park, and especially the areas comprising the Ramsar Site: they should remain strict no-intervention areas (or become so, where this is not yet

the case). No use of machinery, no tree felling, nor plantation, should be undertaken in the mires and their lagg zones.

5. **Clarify the extent of the mire lagg zones and temporary interventions**: As a matter of priority, the lagg zones of the peatbogs need to be identified and delineated, including areas with waterlogged spruce forests. No tree cutting should occur in these areas, especially if they provide essential habitat for threatened wildlife (e.g. capercaillie). However, hydrological restoration measures, that are compatible with the conservation objectives, should be encouraged in these areas. Sanitation cutting of bark beetle-affected trees may be granted, as a temporary derogation, provided that timber is left on the spot, and that the local hydrology and soil structure are not damaged.

6. **Ensure the wise management of the Ramsar Site**: Ramsar Contracting Parties are encouraged to take a management-oriented approach when determining Ramsar Site boundaries, and to include buffer zones around the wetland. This should be considered by the National Park authorities when clarifying the National Park zonation and delineating the lagg zones (cf. Recommendations 3 and 5). The Ramsar Handbooks No. 7 (Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance) and No. 8 (Frameworks for managing Wetlands of International Importance and other wetlands) can provide further guidance.

7. **Monitoring the ecological character of the Ramsar Site**: A monitoring system of the key hydrological parameters and biodiversity indicators should be established for all major Ramsar Site areas. This should ideally be done in close coordination with similar programmes run by the Bayerischer Wald National Park. Special attention needs to be paid to ensure that the methods will be compatible, and their results comparable.

8. **Expansion of mire restoration activities**: The National Park authorities are encouraged to continue and to expand their activities for mire restoration, notably concerning bog hydrology and biodiversity, in the National Park and in the Protected Landscape Area.

9. **Development of a transboundary management system**: The authorities of the Shumava National Park and Protected Landscape Area are encouraged to develop further the cooperation with their counterparts from the Bayerischer Wald National Park at all levels, with the objective of a common, coordinated, transboundary conservation, management and monitoring approach, including activities to increase public awareness, for public education, information and the development of leisure-related activities that are compatible with the conservation management goals.

Acknowledgements

The Ramsar Bureau and the international experts participating in the Ramsar Advisory Mission to the Bohemian Forest would like to thank the managers of both, the Shumava and Bayerischer Wald National Park, and the representatives of the Czech ministerial departments, research institutes, and NGOs, those who helped to prepare the mission and those who participated in it, for their excellent logistical organisation and for the open and friendly atmosphere that reigned throughout the days of intensive debate in Prague, Vimperk and Kvilda, as well as in the Shumava mires and in the Bavarian Forest, both, under sunshine and heavy rain. The exchange of ideas and information during the mission has contributed to a deeper understanding of, and respect for different opinions and concerns. In this sense, the mission will hopefully become a good start for increased international cooperation.

Appendix 1: Composition of the Ramsar Advisory Mission

The following Czech and international experts participated in the Ramsar Advisory Mission:

- Ramsar Bureau, coordinator for Europe: Dr Tobias Salathe (Switzerland)
- Ramsar Bureau, mire conservation expert: Dr Hans Joosten, Greifswald University (Germany)
- Ramsar Scientific and Technical Review Panel, Czech member: Dr Jan Pokorny
- Czech National Ramsar Committee, Ministry of the Environment: Dr Petr Roth
- Czech National Ramsar Committee, Palava Protected Landscape Area: Dr Josef Chytil
- Ministry of the Environment, Department of Forest Protection: Ing. Vladimir Hynek
- Ministry of the Environment, Department of Nature Protection: Mgr Libuse Vlasakova
- Ministry of the Environment, Department of Nature Protection: Dr Milan Rivola
- Ministry of the Environment, Department of Global Relations: Mgr Dagmar Kubinova
- Agency for the Protection of Nature and Landscape of the Czech Republic: Ing. Frantisek Urban
- Shumava National Park and Protected Landscape Area, vice-director: Ing. Vladimir Zatloukal
- Shumava National Park and Protected Landscape Area, wetland expert: Dr Ivana Bufkova
- Bayerischer Wald National Park, director: Karl Friedrich Sinner (Germany)
- Bayerischer Wald National Park, legal and management expert: Franz Baierl (Germany)
- Czech conservation NGOs, representative: Dr Mojmir Vlasin
- South Bohemian University, Faculty of Biology: Dr Karel Prach
- Slovak Academy of Sciences, Forest Ecology Institute: Dr Rastislav Jakus (Slovakia)

Appendix 2: Programme of the Ramsar Advisory Mission

TUESDAY, 5 JUNE

	Arrival of the Ramsar Bureau participants of the RAM in Prague
13h30	**Meeting** at the Ministry of the Environment in Prague at the Department of Nature Protection
14h30	**Departure** for Vimperk by car
17h00	**Meeting** at the headquarters of Shumava National Park and Protected Landscape Area, presentations, study of documents, specification of the mission itinerary
19h30	**Arrival** at Shumava National Park regional office in Kvilda

WEDNESDAY, 6 JUNE

08h30-18h00	**On-the-spot appraisal** of different Shumava mires and visit of bark beetle-affected areas in both National Park Zones I and II, with and without bark beetle control measures, visit of the tourist trail at the Jezerni slat raised bog

THURSDAY, 7 JUNE

08h30-11h30	**Visit** of adjacent bark beetle-affected areas in the core zone and mires and non-affected forests in the buffer zone of the Bayerischer Wald National Park
12h30-17h00	**Visit** of the Mrtvy luh raised bog part of the Ramsar Site at the confluence of Tepla and Studena Vltava rivers in the Shumava National Park, followed by a visit of the former industrial peat extraction site at Soumarsky most peatbog, including newly created mire restoration experimental plots
17h00-22h00	**Discussion** of the mission issues and recommendation proposals at the Shumava National Park regional office in Kvilda

FRIDAY, 8 JUNE

	Return to Prague
12h00-13h00	**Concluding meeting** at the Ministry of Environment in Prague
	Reporting to Deputy Minister Bile
	Return of the Ramsar Bureau experts