Convention Concerning the Protection of the World Cultural and Natural Heritage

IUCN Evaluation of Nominations of Natural and Mixed Properties to the World Heritage List

Report to the Extraordinary Bureau of the World Heritage Committee
Twenty-fifth session
7 – 8 December 2001 – Helsinki, Finland

Prepared by IUCN – The World Conservation Union

20 October 2001

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THE WORLD HERITAGE CONVENTION

IUCN TECHNICAL EVALUATION REPORTS

20 October 2001

1. INTRODUCTION

This technical evaluation report of natural sites nominated for inclusion on the World Heritage List has been conducted by the Programme on Protected Areas (PPA) of IUCN – The World Conservation Union. PPA co-ordinates IUCN's input to the World Heritage Convention. It also co-ordinates activities of IUCN's World Commission on Protected Areas (WCPA) which is the world's leading expert network of protected area managers and specialists.

In carrying out its function under the World Heritage Convention IUCN has been guided by four principles:

(i) the need to ensure the highest standards of quality control and institutional memory in relation to technical evaluation, monitoring and other associated activities;

(ii) the need to increase the use of specialist networks of IUCN, especially WCPA, but also other relevant IUCN Commissions and specialist networks;

(iii) the need to work in support of the UNESCO World Heritage Centre and States Parties to examine how IUCN can creatively and effectively support the World Heritage Convention and individual sites as "flagships" for biodiversity conservation; and

(iv) the need to increase the level of effective partnership between IUCN and the World Heritage Centre, ICOMOS and ICCROM.

Members of the expert network of WCPA carry out the majority of technical evaluation missions. This allows for the involvement of regional natural heritage experts and broadens the capacity of IUCN with regard to its work under the World Heritage Convention. Reports from field missions are comprehensively reviewed by a working session of the IUCN World Heritage Panel at IUCN Headquarters held in April. PPA then prepares the final technical evaluation reports for the June/July session of the Bureau. Any new information submitted by State Parties in response to the requests of the June/July Bureau is reviewed by a second meeting of the IUCN World Heritage Panel in September. PPA then prepares the final evaluation reports for the Committee which are outlined in this document.

IUCN also has placed emphasis on providing input and support to ICOMOS in relation to cultural landscapes and other cultural nominations which have important natural values. IUCN recognises that nature and culture are strongly linked and that many natural World Heritage sites have important cultural values.

The WCPA membership network now totals over 1300 protected area managers and specialists from 120 countries. This network has provided much of the basis for conducting the IUCN technical evaluations. In addition, the Protected Areas Programme has been able to call on experts from IUCN's other five Commissions (Species Survival, Environmental Law, Education and Communication, Ecosystem Management, and Environmental, Economic and Social Policy), from other specialist officers in the IUCN Secretariat, and from scientific contacts in universities and other international agencies. This highlights the considerable "added value" from investing in the use of the extensive networks of IUCN and partner institutions.

2. FORMAT

Each technical evaluation report presents a concise summary of the nomination, a comparison with other similar sites, a review of management and integrity issues and concludes with the assessment of the applicability of the

criteria, and a clear recommendation to the World Heritage Bureau. Standardised data sheets, prepared for each nomination by UNEP-The World Conservation Monitoring Centre (UNEP-WCMC), are available in a separate document.

3. SITES REVIEWED

IUCN received twenty-three files for review in 2001. It was not possible to evaluate two of these sites – the evaluation of one site was postponed by the State Party and another mission was cancelled due to visa difficulties. Twenty-one evaluation reports were prepared by IUCN in 2001. This report includes nineteen of these evaluations as one site was withdrawn and another was deferred by the Bureau. The nineteen reports include: :

- Fifteen (15) natural sites nominations (including three deferred sites for which additional information has been received and three extensions); and

- Four (4) mixed sites (including two deferred sites for which additional information has been received);

It was not possible to review one site for presentation to the June Bureau meeting due to climatic reasons. The delayed evaluation date was at the request of the State Party. This site will be presented to the December Bureau meeting. Two further sites – deferred sites for which additional information was received – were not presented to the June Bureau because the new information presented by the State Parties was not received until after the Bureau meeting.

The files received by IUCN are as follows (* denotes technical evaluation reports which do not appear in this document):

Identification Number	**Nominated Property**	**State Party**	**Recommendation of the June Bureau**
B.	**Nominations of mixed properties to the World Heritage List**		
B.1	**Palaearctic Realm**		
N/C 772 Rev	Cultural Landscape of Fertö-Neusiedler Lake	Austria / Hungary	Not to inscribe
N/C 1040	Masada National Park	Israel	Not to inscribe
N/C 766 Rev	Natural Complex “Central Sikhote-Alin”	Russian Federation	-
N/C 766 Rev	Karain Caves	Turkey	Not to inscribe
C	**Nominations of natural properties to the World Heritage List**		
C.1	**Palaearctic Realm**		
N 1045	Group of Caves containing Speleotherms in Southern France*	France	Withdrawn
N 1041	The Makhteshim Country*	Israel	Deferred
N 1023	Natural System of “Wrangel Island” Sanctuary*	Russian Federation	Mission cancelled
N 765 Bis	Volcanoes of Kamchatka, Extension to include Kluchevskoy Nature Park	Russian Federation	Inscribe
N 1037	Jungfrau-Aletsch –Bietschhorn	Switzerland	Inscribe
N 1047	Holy Tops (Svyati Gory)	Ukraine	Not to inscribe
N 1048	Polissian Swamps and Slovechno-Ovruch Ridge	Ukraine	Not to inscribe

N 1049	Kaniv's Hills (Kanivski Gory)	Ukraine	Not to inscribe
N 1050	Karadag	Ukraine	Not to inscribe
N 1051	Podilliam Ridge	Ukraine	Not to inscribe
N 1029	Dorset and East Devon Coast	United Kingdom	Inscribe
C.2	**Afrotropical Realm**		
N 1060 Rev	Rift Valley Lake Reserves	Kenya	Inscribe
N 801 Bis	Sibiloi/Central Island National Park, Extension to include South Island National Park	Kenya	Inscribe
C.3	**Indomalayan Realm**		
N951 Rev	Phong Nha – Ke Bang National Park*	Vietnam	'Postponed'
C.4	**Neotropical Realm**		
N 1035	Cerrado Protected Areas: Chapada dos Veadeiros and Emas National Parks	Brazil	Referred
N 1000 Rev	Fernando de Noronha Archipelago/Rocas Atoll Tropical Insular Complex	Brazil	-
N 839 Rev	Alejandro de Humboldt National Park	Cuba	-
N	Galapagos Marine Reserve, Extension to Galapagos National Park	Ecuador	Inscribe conditionally
N 1057	Kaieteur National Park	Guyana	Not to inscribe

4. REVIEW PROCESS

In carrying out the Technical Review, IUCN is guided by the Operational Guidelines, which requests IUCN "to be as strict as possible" in evaluating new nominations. The evaluation process (shown in Figure 1) involves five steps:

1. **Data Assembly**. A standardised data sheet is compiled on the site, using the protected area database at UNEP-The World Conservation Monitoring Centre (UNEP-WCMC);

2. **External Review**. The nomination is sent to experts knowledgeable about the site and/or other features for which the site was nominated, primarily consisting of members of IUCN specialist commissions and networks and contacts from the region;

3. **Field Inspection**. Missions are sent to evaluate the site on the ground and to discuss the nomination with relevant authorities and stakeholders;

4. **IUCN World Heritage Operational Panel Review**. The IUCN World Heritage Operational Panel intensively reviews all field inspection reports and associated background material and agrees a final text and recommendation for each nomination; and

5. **Final Recommendations**. After the World Heritage Bureau has reviewed the evaluations, clarifications are often sought. Changes based on the Bureau's recommendations and on any further information from State Parties are incorporated into the final IUCN evaluation report which is sent to the World Heritage Centre eight weeks prior to the December Bureau and Committee meeting.

In the evaluations, use of the Biogeographic Province concept is used for comparison of nominations with other similar sites. This method makes comparisons of natural sites more objective and provides a practical means of

assessing similarity. At the same time, World Heritage sites are expected to contain special features, habitats and faunistic or floristic features that can also be compared on a broader biome basis.

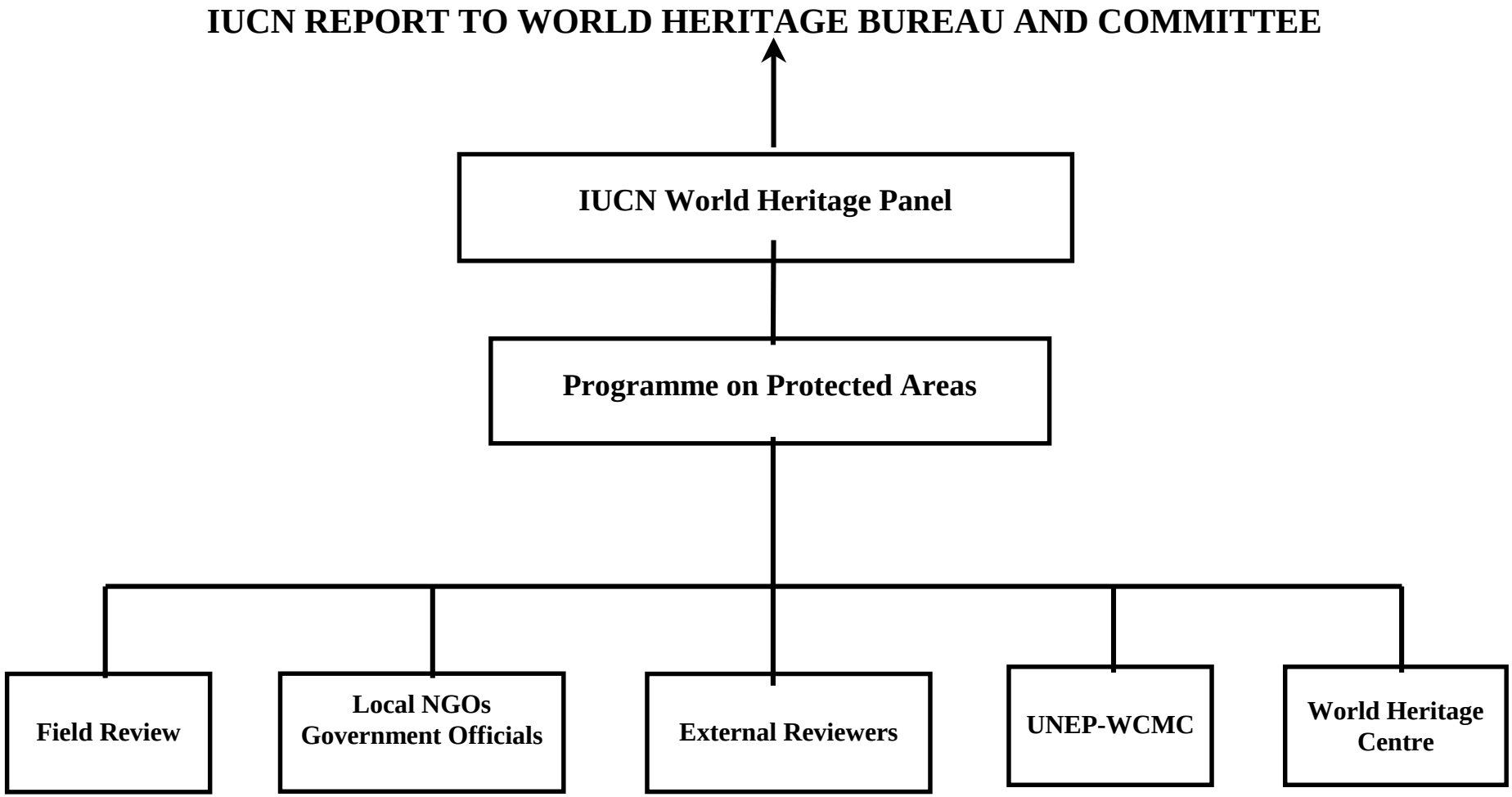
It is stressed that the Biogeographical Province concept is used as a basis for comparison only and does not imply that World Heritage sites are to be selected solely on this criteria. The guiding principle is that World Heritage sites are only those areas of Outstanding Universal Value.

Finally, it is noted that the evaluation process is aided by the publication of some 20 reference volumes on the world's protected areas published by IUCN, UNEP, WCMC and others. These include (1) Reviews of Protected Area Systems in Oceania, Africa, and Asia; (2) the four volume directory of Protected Areas of the World; (3) the three volume directory of Coral Reefs of the World; (4) the six volume Conservation Atlas series; (5) The four volume "A Global Representative System of Marine Protected Areas; and (6) Centres of Plant Diversity. These documents together provide system-wide overviews which allow comparison of the conservation importance of protected areas throughout the world.

As in previous years, this report is a group product to which a vast number of people have contributed. Acknowledgements for advice received are due to the external evaluators and reviewers and numerous IUCN staff at Headquarters and in the field. Many others contributed inputs during site inspections. This support is acknowledged with deep gratitude.

This report presents the official position of IUCN.

Figure 1


IUCN REPORT TO WORLD HERITAGE BUREAU AND COMMITTEE
IUCN World Heritage Panel
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Field Review
Local NGOs
Government Officials
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WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

CULTURAL LANDSCAPE OF FERTÖ-NEUSIEDLER LAKE (AUSTRIA AND HUNGARY)

1. DOCUMENTATION

i) **IUCN/WCMC Data Sheet**: (7 references)

ii) **Additional Literature Consulted**: BirdLife International 2001, **Data Base for Important Bird Areas**, Wageningen, Netherlands; Grimmett R.F.A. and Jones T.A., 1989, **Important Bird Areas in Europe** ICBP, Cambridge, UK; Heath M. and Evans J (eds.) 2000, **Important Bird Areas in Europe - Priority Sites for Conservation, (vols. 1 and 2),** BirdLife International, Cambridge, UK; Patten B. (ed.), 1994, **Wetlands and Shallow Continental Water Bodies Vol. 2,** SPB Academic Publishing; Province of Burgenland 1995, **Nomination of the Neusiedler See/Seewinkel as a Natural World Heritage Site,** Eisenstadt, Austria; Ramsar Secretariat 2001, **Annotated Ramsar List,** Gland, Switzerland; Thielcke G. and Resch J. 2000, **Living Lakes**, Stadler Verlag, Constanz, Germany; Thorsell J., Levy R.F. and Sigaty T. 1997, **A Global Overview of Wetland and Marine Protected Areas on the World Heritage List, IUCN,** Gland, Switzerland; Tucker G. and Evans M. 1997, **Habitats for Birds in Europe,** BirdLife International, Cambridge, UK; UNESCO MAB Programme 2001**, UNESCO MAB Biosphere Reserve Directory**, Paris;

iii) **Consultations:** 8 external reviewers contacted. Relevant officials from Austrian and Hungarian park authorities.

iv) **Field Visit**: A. Phillips (IUCN) with A. Michalowski and B. Werner. M. Rymkiewicz, (ICOMOS) March 2001.

2. SUMMARY OF NATURAL VALUES

The Fertö-Neusiedler Lake area is located on the Austrian-Hungarian border. It is an unusual and diverse ecosystem, affected by a long period of interaction between people and nature. The shallow, steppe lake (on average only 50-60cm in depth) is the largest saline water body in Europe (about 309km^2), and the most westerly in Eurasia. It is about 20,000 years old, at a late stage of succession. Its water level is now subject to artificial control. The reeds that cover between half and two-thirds of the lake provide a crucial habitat for many nesting birds, such as the great white egret (over 1000 pairs) and bittern. The lake is internationally important for migratory birds, and many bird species rest and feed here at the base of the Alps. To the east of the lake is the important Seewinkel area, with some 80 shallow saline ponds and remnant salt meadows where thousands of geese arrive in the late autumn. The basic fauna of the lakeshore is of European or Central European origin with a few endemic species and a specifically prairie type fauna.

The flora of the nominated site is strongly affected by the convergence of four climatic zones resulting in some unique assemblages of species from different bio-geographic regions, and several rare endemics. There are various natural habitats including saline grassland and marshlands, steppe-relicts, bogs, and drought tolerant oak stands. Around the lake, viticulture is the most important land use, but there are other man-made or semi-natural habitats of ecological and landscape importance which along with some attractive villages, help to create a landscape of great appeal. Some of these surrounding lands are also included in the nomination and the rest is in the buffer zone. The landscape setting of the lake, the bird populations and the existence of so many biotopes in a relatively small area are the most important natural values of the site.

3. COMPARISONS WITH OTHER AREAS

From the standpoint of physical geography, the Fertö-Neusiedler Lake ecosystem is the most westerly of a string of saline steppe-lakes across Eurasia. It is important because of its special climatic and other conditions. However, it needs to be compared with other similar if distant lakes.

A tabular comparison may be made with several saline lakes elsewhere in the world in Central Asia, the Middle East, North America and Argentina (see table 1 below). This shows that many of these lakes are substantially larger and likely to be in a less modified condition than the nominated site. Whilst the salinity level (1700 mg/litre on average) of the nominated site is quite low, at less than half that in the oceans, the particular saline biotope complex found at Fertö-Neusiedler Lake is a unique assemblage.

Table 1 : Some features of saline lakes: nominated site and other lakes

Saline Lake (source: Thielcke and Retsch, 2000)	*Area km²*	*Catch-ment km²*	*Age (in 000 yrs.)*	*Sea level m.*	*Salinity (gm/l)*	*Human population nearby*
Neusiedlersee/ Fertö, Austria/Hungary	309	1,230	20	115	17	68,000
Lake Tengiz /Kurgald Shin, Kazakhstan	1920	94,900	?	304	30-40	20,000
Lake Mono, USA	182	1,800	176	1947	29-275	?
Dead Sea, Israel/Jordan/ Palestine	1050	42,000	12	-316	340	30,000
Mar Chiquita, Argentina	ranges 1969-5770	37,570	30	62-71	75	?

The nominated site is located within two “Udvardy” Biogeographical Provinces, Middle European Forest and Pannonian. There is no existing natural World Heritage site in these provinces. Although it occurs in a different Biogeographical Province (the Pontian Steppe), comparison with the World Heritage Site of the Danube Delta Biosphere Reserve provides a measure of the relative importance of the nominated site for species conservation. The Danube Delta is about six times larger, and it contains the only reedbed which exceeds that of Fertö-Neusiedler Lake, though it is not a saline environment. The delta contains the largest continuous marshland in Europe. The bird species list of the two sites is somewhat similar, but for many species the Danube Delta is frequented in far greater numbers. For example Purple Heron (500 in Fertö-Neusiedlersee Lake, 1,500 in Danube Delta) and Teal (20,000, and 150,000); on the other hand there are more Great White Egret at the nominated site and impressively large numbers of geese species (bean, white-fronted and greylag) migrate to it annually.

In its detailed site by site comparison of European Important Bird Areas (IBAs), BirdLife International notes that the IBA on the Hungarian side (Lake Fertö, covering 12,542ha) is "an important breeding and staging post in Europe". It describes the two Austrian IBAs within the nominated site, Neusiedler See (23,272ha) and Southern Seewinkel (14,000ha), in similar terms. Generally, using the IBA criteria, it appears that the Austrian part of the nominated site is the most important wetland area in that country; whereas the Hungarian part is among the top five such sites in Hungary. The IBA analysis identifies one species of global concern as resident at the nominated site in significant numbers, the Ferruginous Duck. This compares with the number of species of global concern found at other European wetland World Heritage sites: ten in the Danube Delta, six in Donana (Spain), and three at the Srebarna (Bulgaria). Comparison may also be made with the Hortobágy National Park/Ramsar Site, a World Heritage cultural landscape in the Pannonian Biogeographical Province in Hungary. This has a diverse range of wetland habitat types, including saline marshes. BirdLife International has described Hortobágy, which has significant numbers of eight globally threatened species, as "the most important site in Hungary for steppic birds and waterfowl" (BirdLife International, 2000).

Table 2 compares the IBA information for the nominated site and other World Heritage Sites in Europe.

Table 2 : Important Bird Areas: comparative significance of nominated site within Europe

Important Bird Area (IBA) (source: BirdLife International 2000)	*A1 criterion bird spp.*	*A4 Criterion bird spp.*	*regionally important congregations of*	*Congregations of bird spp. of importance to the*

			bird spp.	*EU*
Neusiedlersee, Austria	1	3	9	13
Seewinkel, Austria		4	6	15
Ferto, Hungary	-	5	11	n.a.
Total nominated site	*1*	*8*	*13*	*24*
Hortobagy, Hungary	8	13	29	n.a
Donana (Guadalquivir Marshes), Spain	6	22	33	39
Danube Delta, Romania	10	30	54	n.a.
Srebarna, Bulgaria	3	2	11	n.a.

A1 criterion = the site regularly holds significant numbers of globally threatened species. A4 criterion = site holds globally important congregations (in most cases the site is known to hold, on a regular basis, 1% or more of a bio-geographic population of a congregatory waterbird species).

Note that many birds occur under several criteria.

Finally it should be noted that in the publication *A Global Overview of Wetland and Marine Protected Areas on the World Heritage List*, (1997) IUCN identifies only two wetland sites which appear to merit consideration for inclusion on the World Heritage gaps in the Western Palearctic Region: the Wadden Sea and the Volga Delta.

4. INTEGRITY

4.1 Boundaries

The rationale used for the boundaries of the nominated site and the buffer zone is different in Austria and in Hungary.

In Austria, the nominated site is in general aligned with the boundaries of the Ramsar site. It includes many of the vineyards and other farmed areas around the eastern part of the lake, but is generally bounded by the reedbelt on west and north; it includes the nature and protection zones of the Neusiedler See-Seewinkel National Park. Also included is the historic centre of the town of Rust. The buffer zone is identical with the Neusiedler See-Seewinkel nature and landscape reserve.

In Hungary, where the Ramsar boundaries were drawn more tightly, the nominated site is essentially that of the Fertö (western) part of the larger Fertö-Hanság National Park, including both the nature area and the protection zone of the park. To this has been added the Nagycenk and Fertö palaces and a part of village of Fertorakos.

4.2. Legal Protection and Transboundary Co-operation

National measures for conservation began in the 1920's on the Austrian side when small areas of land were taken on lease by organisations for nature protection. In the 1930s, there was a movement to create a national park. Landscape and nature protection regulations began in 1962 with the Neusiedlersee Nature Reserve. Protection was progressively strengthened until the Neusiedler See-Seewinkel National Park was gazetted in 1993.

In Hungary, the Fertö Landscape Protection Area (created in 1977) became the Fertö National Park in 1991, renamed Fertö-Hanság National Park in 1994.

In 1987, the Austro-Hungarian National Park Commission was established to oversee transboundary co-operation in the management of the two national parks. There is also an international commission dealing with the water level of the lake. Credit is due to the authorities of both countries for the excellent work now being done for conservation and for the degree of co-operation that has occurred across the international border.

As to international protection, UNESCO designated the Neusiedler See - Österreischer Teil Biosphere Reserve in 1977, and the Lake Fertö Biosphere Reserve on the Hungarian side of the border in 1979. The Neusiedler See, Seewinkel and Hanság Ramsar Site was established in 1982 on the Austrian side, and the Lake Fertö Ramsar Site in 1989 on the Hungarian side. The lake and its surroundings are also designated as a Council of Europe biogenetic reserve (the area is almost identical to the hydrographic catchment of the lake). The Austrian side is

designated as a Special Protection Area (SPA) under the EU Birds Directive of 1979 and a Special Area of Conservation (SAC) under the EU Habitats Directive of 1992. The Austrian part of the area proposed for World Heritage listing has been accepted as a Natura 2000 site, a development that will require the preparation of a management plan; the Hungarian part will be added to the Natura 2000 site when Hungary joins the EU.

4.3 Threats

As a potential *natural* World Heritage Site, the nomination of the Cultural Landscape of Fertö-Neusiedler Lake raises some serious integrity questions. These include:

- The presence of several small towns (notably Apelton, Illmitz, and the tourist resort of Podersdorf) within the Austrian part of the nominated area. The combined population of these and other settlements is 3,200; over 60,000 more live in the buffer zone;

- Some prominent tourist developments are to be found, all on the Austrian side. There is an "esplanade" at Podersdorf (the only lakeside shore free of reeds), a large hotel at the water's edge at Rust, an operetta stage on an island near Morbisch, and a number of medium-sized ferries that run between several Austrian resorts across the northern part of the lake;

- There is also an intrusive high voltage power line that crosses several kilometres of the reed beds in the north west part of the site;

- There are numerous vineyards within the nominated site, some of them planted quite recently on what were formerly floristically-important meadows. Even though wine growing has occurred here since Roman times, modern methods of viticulture are intensive, with regular use of chemicals and intrusive techniques such as the use of low flying aircraft to scare off starlings.

- Introduced fish (e.g. eels, carp) affect all parts of the nomination including the core Nature Zone within the two national parks.

- Water quality remains another concern. Despite successful strategies to reduce run-off entering the lake, the waters are still eutrophied.

More far reaching are the effects of drainage modification. The water level of the lake varied greatly in the past. Naturally it was a markedly "astatic" lake, drying out on a number of occasions (the last in 1868) - but also with floods when it was twice its present size. In times of flood, it would drain away through the Hanság Marshes to the south east, and thence, eventually, to the Danube. In order to control flooding and assist in reclamation of land for farming canals and bunds have been constructed within the nominated site. The water level is now maintained under an international agreement through an international commission.

4.4. Management

There is currently no joint management plan for the nominated site and management varies according to the protection zone involved in each country. Thus, in the core nature zone of the two national parks, there are strict controls over public access. Fishing or hunting other than for conservation purposes (e.g. control of wild boar) are forbidden. The spread of reeds is controlled so as to keep open water areas.

In the protection zone, a more active management regime is in place. For example, traditional grazing systems are being restored so as to recreate puszta (steppe) grasslands, using native Hungarian long-horned grey cattle, water buffalo, racka (long horned) sheep, Przewalskii's horse and mangaliza (hairy) pigs. Traditional methods of reed cutting are also encouraged in this zone, some of which is used to roof local buildings in the traditional style. Wetland habitats are being carefully managed and, especially on the Hungarian side, restored. The opportunity is also being taken to acquire additional areas to add to land in the management of the national parks. The positive effects of such actions on species and habitats have been observed in recent research work (e.g. recovery of rare orchid populations).

The management of the wider landscape beyond the national parks follows generally similar lines, with emphasis on supporting traditional land use and maintaining traditional village form to safeguard the integrity of the landscape setting of the lake.

Much attention is given to visitor management, with excellent visitor centres at Sarrod (Hungary) and Illmitz (Austria). The Austrian national park annually attracts some 700,000 visitors. The management of the parks in both countries emphasises eco-tourism and visitor education.

Under the auspices of the joint commission, there is considerable collaboration in the management of the two national parks (e.g. in monitoring, scientific research and visitor services). The parks use the same symbol and the two staffs wear the same uniform. The forthcoming preparation of a management plan for the Natura 2000 site should be used to consolidate the Austrian management regime and link it still more closely to that on the Hungarian side.

A further challenge to transboundary co-operation relates to the different regimes for nature and culture protection within the two neighbouring countries. This is further complicated in the case of Austria where responsibilities for nature and landscape protection lie essentially at the provincial level, whilst the Federal Government has many responsibilities for conservation of the cultural heritage. Finally there are a large number of existing national and international protection designations (on the natural side), with overlapping boundaries and some duplication of function.

5. ADDITIONAL COMMENTS

None.

6. APPLICATION OF CRITERIA

The Cultural Landscape of Fertö-Neusiedler Lake was nominated as a mixed site, and IUCN and ICOMOS therefore fielded a joint mission. The site was nominated under natural criteria (ii), (iii) and (iv). IUCN concludes as follows:

Criterion (ii): Ecological processes

The Fertö-Neusiedler Lake does display a number of unusual ecological and biological processes, many of which are rare, if not unique, in Europe. Overall, however, the site cannot claim to be so globally unique that it can satisfy this criterion. Other saline lakes elsewhere in the world better exemplify the bio-physical processes associated with closed lake systems. This is especially so, since the controls over the lake levels and the impact of eutrophication etc., mean that those bio-physical processes are no longer able to follow their natural course, and cannot therefore be said to be "on-going". Despite commendable efforts to restore the natural situation, the lake regime remains to some extent artificial. IUCN does not consider that the nominated site meets this criterion.

Criterion (iii): Superlative natural phenomena or natural beauty and aesthetic importance

The natural beauty of the lake is very evident, however, its greatest appeal arises from the proximity of the reedbeds to the nearby meadows and vineyards, and the way in which the lake is overlooked by a number of attractive historic villages. It is the juxtaposition of natural and cultural values that makes for the exceptional beauty of the nominated site – but these are qualities of a cultural landscape rather than a natural site. IUCN does not consider that the nominated site meets this criterion.

Criterion (iv): Biodiversity and threatened species

Criterion (iv) is most relevant to the site's importance for bird conservation. Fertö-Neusiedler Lake is undoubtedly one of Europe's premier sites for birds, as the Ramsar, SPA and other international designations confirm. The nominated site is a key location for many birds on the major flyways for migratory birds seeking to fly around the Alpine barrier but whether it is of global significance is another question. When set alongside the Danube Delta or Donana, it is not of quite the same order, as BirdLife's detailed IBA analysis demonstrates. It has neither the numbers nor the rarities to justify inclusion among the premier wetland sites in the world. The site has also many different kinds of increasingly rare biotopes occurring in a small area, but this is not so unusual that it can be said to be of outstanding universal value. IUCN does not consider that the nominated site meets this criterion.

The evaluation also raises a number of significant integrity questions as described above.

7. RECOMMENDATION

The Bureau did not recommend the inscription of the Cultural Landscape of Fertö-Neusiedler Lake on the World Heritage list under natural criteria.

The Bureau congratulated the Austrian and Hungarian authorities for the collaborative work that they have already undertaken in setting up and managing the adjoining national parks, and in preparing this joint nomination. The Bureau recommended that the Committee should encourage this collaboration to continue in future, particularly through the framework of the requirements of Natura 2000.

WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

CENTRAL SIKHOTE – ALIN (RUSSIAN FEDERATION)

1. DOCUMENTATION

i) **IUCN/WCMC Data Sheet:** (4 references)

ii) **Additional literature consulted:** Newell, J. & Wilson, E., 1996. **The Russian Far East: Forests, Biodiversity hotspots, and Industrial developments.** FOE, 200pp.; Bocharnikov, V.N., 1996. **The Sikhote-Alin Nature Complex as an object of the World Heritage list.** *Vestnik DVO RAN (5),* 43-53.*;* Zhuravlev, Yu.N., (Ed.) 2000. **A Biodiversity Conservation Strategy for the Sikhote-Alin.** Russian Academy of Sciences (Far Eastern Branch), Vladivostok, 135pp.; Matthiessen, P., 2000. **Tigers in the Snow.** Harvill Press, London. 185pp.

iii) **Consultations:** 8 external reviewers contacted. Local experts; officials from the Russian Ministry of Natural Resources, the Committee on Natural Resources of Primorskii Krai, and the local administrations of Terney and Bikin; Udege leaders in Krasny Yar.

iv) **Field visits:** J.Thorsell and J.Cassils in September 1996; L.F.Molloy and R.Hogan in July 2001.

2. SUMMARY OF NATURAL VALUES

The nominated site lies within the Sikhote-Alin mountain range in the extreme south-eastern corner of the Russian Federation, a region with a climate and biodiversity entirely different from the rest of Russia. The Sikhote-Alin is not a major mountain range (1,100km in length and up to 1830m in altitude) but a vast unmodified temperate forest wilderness lying within northern latitudes (44-49^{o} N). Elsewhere, at these latitudes, the mixed coniferous/deciduous forests of western Europe and North America have largely been removed or severely modified. Lying between the coastline of the Sea of Japan in the east and the valleys of the Amur and Ussuri rivers in the west, the Sikhote-Alin is subject to both maritime and continental climatic extremes. Summers are warm and wet because of the rain-bearing south-eastern monsoon winds (up to 85% of precipitation can fall in summer); in winter, the icy north-westerly Siberian winds bring snow to the mountains and temperatures can drop as low as –50^{o} C in the Bikin valley (with less than 100 frost-free days per annum in the western valleys). The large Bikin River freezes over from October until March.

The nominated Central Sikhote-Alin site in Primorskii Krai consists of two units separated along the crest of the range by a distance of 70km (see Map 2):

- The southern unit consists of two protected areas separated from each other by the town of Terney:

1) **Sikhote-Alin Nature Preserve** (401,428ha) on the eastern maritime slopes near the town of Terney (including a marine protected zone of 2,900ha, extending 1km out from the coastline); This is a 'Zapovednik' or IUCN Category 1a (Strict Nature Reserve) and has also been designated a UNESCO Man and the Biosphere Reserve; and

2) **Goralij Zoological Preserve** (4,749ha) an IUCN Category IV (Habitat/Species Management Area) is a coastal zone north of Terney.

- The second, or northern unit, consists of two contiguous areas located on the **Bikin River** catchment upstream of the town of Krasny Yar:

1) **Bikin Territory of Traditional Nature Use (TTNU)** (407,764ha) for the Udege people in the middle Bikin, this area has no IUCN designation; and the

2) **Verkhnebikinski zakaznik** (746,482ha) covering the entire upper Bikin catchment above the river junction at Ushaia). This is an IUCN Category IV protected area (Habitat/Species Management Area).

The total area of the nominated site is approximately 1,560,000ha.

The Sikhote-Alin protected areas are considered to contain the greatest plant and animal diversity on the north-western coastline of the Pacific Ocean. The region lies at the junction of the Eurasian continent and the Pacific plate, a biogeographic 'mixing zone' which largely escaped the rejuvenating impacts of the last glaciation and allowed the development of the ancient *'Turgai'* biota during the Tertiary and early Quaternary periods. This unique assemblage of biota contains elements from Manchuria, Okhotsk-Kamchatka (Bering), eastern Siberia and Dauria-Mongolia. The unique combination of its severe climatic characteristics, physical isolation, and traditional resource use by the Udege and other indigenous peoples, has meant that 80-90% of the region's vegetation still remains as dense temperate forest and taiga.

The site lies within the 'Primorye' Centre of Plant Diversity identified by IUCN and WWF; it also lies partly within WWF's 'Russian Far East temperate broadleaf and mixed forest' ecoregion 71 (Global 200). Forests cover 95% of the site, with alpine tundra, coastal shrublands, meadows and bogs accounting for the rest of the area. More than 180 tree and woody shrub species occur in these forests; the most characteristic large trees are: Korean pine, Jeddo spruce, needle fir, several species of larch, Manchurian ash, white-barked elm and Mongolian oak. At higher altitudes, the forests have a higher proportion of conifers and small-leaved deciduous trees, typically birches, Koyama spruce and Siberian larch. Along the banks of the Bikin River, there is a preponderance of white-barked elm, Korean pine and Maximovitch poplar. Korean pine is a prolific 'nut' (seed) producer, essential to the survival of at least 30 mammal species, and important as a food source (rich in edible oils) for the indigenous people. In total, almost 1200 vascular plant species are present, including many of medicinal value and importance to the indigenous people; the best-known plants in this category are ginseng and Siberian ginseng.

More than 400 vertebrates have been recorded, including 241 bird species, 65 mammals, seven amphibians, 10 reptiles and 51 fish. The site is renowned in international conservation circles as the largest intact habitat for the extremely rare Siberian (or Amur, or Ussuri) tiger. In addition, it is the habitat of brown bear, Himalayan black bear, lynx, goral, sika deer, yellow-throated marten, Manchurian hare, scaly-sided merganser and other endemic and/or endangered species. Seals are a feature of the Sikhote-Alin coastline.

3. COMPARISON WITH OTHER AREAS

The region of Ussuriland in which the nominated area occurs is one of the world's most distinctive natural regions. Ussuriland extends southwards from the mouth of the River Amur to the border with China and Korea. It is bounded on the west by the Ussuri River and on the east by the Sea of Japan. No other area has this particular mix of flora and fauna and, combined with glacial history, this has helped to make the Ussuri region a priority for conservation in Russia. For example, the WWF report by Krever *et. al.* (1994) for the World Bank states that "the bioregion is critical to global biodiversity conservation because is contains some of the richest and most unusual temperate forests anywhere in the world. Compared to other temperate ecosystems, the level of endemic plants and invertebrates present in the region is extraordinarily high which, together with the region's unique biogeographic history, has resulted in unusual assemblages of plants and animals."

The Sikhote-Alin nomination lies within Udvardy's *'Manchu-Japanese Mixed Forest'* biogeographic province. There are currently no other natural World Heritage sites listed within this province. The Russian Federation has nine other protected areas within this biogeographic province (including the Lazovsky zapovednik, 120,000ha, which is also Amur tiger habitat) but Sikhote-Alin is by far the largest and most important. Within the Sikhote-Alin Range, the Bikin cluster of the nomination is considered to be the only intact large-scale watershed on the western slopes of the Sikhote-Alin. A report by the Russian Academy of Sciences notes that the Bikin is "one of the last intact, large scale watersheds not only in the Russian Far East but also in the Northern Hemisphere." The Bikin catchment also includes one of the most expansive mountain plateau systems of the Sikhote-Alin range.

The biogeographic province extends across Heilongjiang and Jilin provinces of north-eastern China, but the only protected area approaching Sikhote-Alin in significance is the Changbai Mountain Nature Reserve of 190,582ha (originally established as a category IV protected area in 1961 but re-classified by IUCN as category Ia in 1986). Like Sikhote-Alin, Changbai is a Biosphere Reserve of long-standing. Although the Changbai Mountains are

higher (2,691m), they lack any lowland forest (below 300m) or any coastal landforms and biota. The Changbai Mountain protected area, and the adjacent Tumen and Yalu rivers forming the border with North Korea, were Amur tiger habitat in the 19th Century but relentless forest clearance and tiger hunting has eliminated the last populations.

Hokkaido, the northernmost of Japan's main islands, also lies within the Manchu-Japanese Mixed Forest province. However, there are no sites equivalent to Sikhote-Alin in Hokkaido: the two IUCN category Ia protected areas in Hokkaido are very small (674ha and 1,895ha) and the two main forested national parks (Daisetsuzan and Shiretoko) are IUCN category IV and extensively developed. Shiretoko does have many of the maritime forest characteristics of Sikhote-Alin and it has the advantage of being among the most natural of Japan's 28 national parks. However, the combined area of Shiretoko 'Special Protected Area' and adjacent Mount Onnebetsu Wilderness Area is 25,460ha – only about 1.6% of the area of the Sikhote-Alin nomination.

There are two comparable large continental/maritime natural World Heritage sites at these latitudes in North America – Olympic National Park bordering the Pacific Ocean in Washington state and Gros Morne National Park on the western Atlantic seaboard in Newfoundland & Labrador province of Canada. Olympic National Park (Oregonian biogeographic province) is an outstanding temperate rainforest but its climate is very different (much wetter and warmer) than Sikhote-Alin and its forest is more coniferous. Olympic is not listed for its biodiversity value or endangered species (criterion iv). Gros Morne National Park, likewise, is not listed under criterion (iv); it is wetter and cooler (in summer) than Sikhote-Alin and its lacks the latter's forest community diversity. Gros Morne is listed primarily for its geological history (especially glaciation in an island setting).

The sites of Giants Causeway (UK) and Miguasha (Canada) are not comparable because of their very small size and specialist geological character. Two other maritime sites are also not comparable with Sikhote-Alin – Redwood National Park on the Pacific slopes of the Coast Range in northern California (lower latitude and fragmented protected area units) and the island of St Kilda in the Atlantic Ocean off the western coast of Scotland (small size and higher latitudes). The Redwoods site is not listed under criterion (iv). There is no forest on St Kilda but it is listed under criterion (iv) because of its outstanding sea bird populations. Sikhote-Alin also has a number of species in common with Shirakami-Sanchi in Japan which was inscribed for the importance of its cool-temperate ecological processes. However, the beech forest is considered to be low in species diversity and endemics. For example, it has approximately 500 plant species compared to the 1,200 species found in the nominated area. The Western Caucasus is at similar latitude to Sikhote-Alin but shows a much greater variation in altitude. Though this site has a higher diversity of plants (almost 1,600 species) it has a lower diversity of vertebrates than Sikhote-Alin.

Two Pacific coastal World Heritage sites are found further north: Russia's Volcanoes of Kamchatka and Tatshenshini-Alsek/Kluane National Park/Wrangell-Saint Elias National Park and Reserve and Glacier Bay National Park. Both of these sites include important glacial and volcanic features which are not present in Sikhote-Alin. Both sites also have biodiversity values. In the case of the 3.7 million hectare Kamchatka site, biodiversity is high relative to other areas at the same latitude and includes the world's greatest diversity of salmonoid fish as well as important populations of seabirds and marine mammals. The Tatshenshini-Glacier Bay complex covers some 10 million hectares and includes tundra and Sitka spruce forests. It is important for natural processes such as glacial activity, plant succession and animal migration. The area is also important for wildlife, including endangered species such as the humpback whale. While the nominated area is smaller in area it is clearly richer in biodiversity.

4. INTEGRITY

4.1. Boundaries

When Sikhote-Alin zapovednik was established in 1935 it comprised 1,800,000ha, and was at that time the largest zapovednik in Russia and one of the largest strictly protected areas in the world. In 1951 it was reduced to about one sixth of its original size, although subsequent additions have increased it to its present size of 405,000ha. When the Sikhote-Alin site was first nominated for World Heritage in 1996, it then comprised 2,680,000ha but, in its evaluation, IUCN pointed out that only 14% of the nomination had a legal status as protected area. The nomination was subsequently deferred, with a recommendation that it be resubmitted once:

- protected status was conferred on the Bikin catchment and the Sikhote-Alin zapovednik was extended to the north, and

- consultation was undertaken with the government of Primorskii Krai and the local indigenous people (in the Bikin and Iman valleys).

The present nomination has made significant progress in fulfilling the 1996 recommendations, in that:

- the entire middle and upper catchments of the Bikin River (a vast area of more than 1,154,000ha) is now protected from the exploitative commercial forestry and mining which has depleted the natural resources of much of the Sikhote-Alin region (especially the coastal slopes), and

- the government of the Primorskii Krai and the Udege people have expressed their support for the nomination and for continued protection of the landscapes and biota contained within the two main areas.

However, there are still some outstanding integrity issues which need to be addressed. The first is the need for a protected area along the 70km of the crest of the Sikhote-Alin Range, linking the zapovednik with the Bikin catchment. The second is the desirability of linking the headwaters of the Bikin with the coast around the town of Svetlaya, to give a contiguous west-east corridor of largely unmodified forest. An aerial inspection of this watershed between the upper Bikin and the coastal slopes above Svetlaya revealed the unsustainable nature of the forest clear-cutting carried out by a joint Russian/South Korean forestry venture. A major logging road is currently being built from Svetlaya to Khabarovskii Krai through this forested upland around the head of the Bikin watershed, so there is an urgent need to develop a network of protected areas and sustainably-managed forests (which are still suitable as wildlife habitat) to buffer the Bikin and provide a forest corridor to the coast.

There is a sound strategic framework for the entire nominated area (and surrounding forest 'buffers') in the prescriptions (until 2005) contained in "A Biodiversity Conservation Strategy for the Sikhote-Alin" (Zhuravlev et al), published in 2000 and approved by a decree from the Governor of Primorskii Krai. The strategy sets out a plan for "A System of Territories to Conserve the Amur Tiger Population" along the length of the Sikhote-Alin Range in Primorskii and Khabarovskii Krais. The plan is comprised of existing and proposed protected areas and traditional/multiple use zones linked by ecological corridors. This system of territories would conserve the territory's biodiversity and provide the minimum essential area for the short-term conservation for the Amur tiger (conserving the territories of 50 mature females). However, for the long-term conservation of the Amur tiger population, habitat must be secured for a further 250 females. The plan proposes the development of a zoning process and special management regimes for the most important habitat outside of protected areas.

Despite the size of the Bikin, the management of surrounding areas has an impact on the population of mammals within it. An adequate buffer zone or regulation of activities in these areas is essential to the long-term protection of the site. The northern boundary of the nominated area coincides with the administrative boundary between Primorskii and Khabarovskii Krais but logging activities have been approved in some of the adjacent lands in Khabarovskii.

4.2. Management

The management plan for the Sikhote-Alin zapovednik expired in 2000 and a revised plan is currently being prepared. There is no management plan for the Bikin TTNU or Verkhnebikinskiy zakaznik and this is a planning challenge for the government of Primorskii Krai.

The Bikin TTNU is an area of traditional use set up to maintain the way of life of the Udege indigenous people. The sustainable use of the area's natural resources is permitted under the responsibility of the Primorskii Krai Department of Wildlife Resources. Economic activities include hunting, the collection of NTFP's and some timber harvesting. The commercial rights to the areas are currently leased to the *'AO Bikin'* enterprise which is responsible for the management of the NTFP resources. In the past there were hunting and fishing inspectors to monitor use of the area but there is no longer any effective field monitoring. A report from the 'Bikin Project' (see below) notes that 'official data and expert opinion conclude that the harvest of wild game is already near its maximum, and for the majority of species current harvest rates are not sustainable. And in view of an absence of data on illegal take of these species, especially poaching from surrounding regions, there is little doubt that there has been a dramatic reduction in the population numbers of native animal species.'

In the Bikin TTNU the Udege have the right of veto on activities if the community considers them to be detrimental to their traditional values. During the field mission the Bikin residents noted that they were not involved adequately in the management of the area and that their access to their traditional hunting lands is

subject to a complex licensing system. The designation of the Verkhnebikinskiy zakaznik on the Upper Bikin which was formerly an Ethnic Territory of the Bikin residents has also caused insecurity about future access to this land by the Udege for commercial and subsistence use.

The management of the Verkhnebikinskiy zakaznik is under the responsibility of the "Maritime Wood Department" which is a regional branch of the Federal department of forestry. The Zakaznik has a set of regulations which outlines activities which are prohibited or sanctioned in the area. The regulations allow for "commercial logging of secondary forest resources" as well as hunting and collection of NTFPs.

In conclusion the management regime in the Bikin is far from satisfactory. The Udege have few rights on commercial harvest of NTFPs and feel that they do not have adequate control over their own resources. The Udege are also under pressure from illegal hunting which is contributing to the unsustainable harvest of many animal species - especially ungulates. In addition, there is a problem with the unsustainable use of areas adjacent to the Bikin which are important for maintaining the populations of animal species hunted in the Bikin. IUCN is also concerned about the impact of small-scale logging on the ecology of the area.

4.3. Threats

Poaching and illegal logging currently threaten the ecology of the entire Sikhote-Alin range and are the main threats to the integrity of the nominated site. Logging and hunting in adjacent lands can impact heavily on protected areas – reducing animal populations and severing important biological corridors. A major international research and management programme is attempting to secure the future integrity of the population of Amur tiger, in particular, its protection from poaching and careful regulation of the hunting of its ungulate prey species. Sikhote-Alin zapovednik benefits from an enforcement programme which has received financial assistance from WWF and has proved to be quite effective.

5. ADDITIONAL COMMENTS

The Sikhote-Alin site has been nominated under both natural and cultural criteria. IUCN believes that there is a very close relationship between the natural ecosystems of the Sikhote-Alin and the hunting culture of the Udege indigenous people. The protection of the natural landscape is an essential pre-requisite for the continuation of the Udege culture.

In the 1990s the US State Department and US Forest Service funded the "Bikin Project" which carried out extensive socio-economic and biodiversity research in the Bikin watershed and developed proposals for biodiversity conservation and local economic development of the Bikin. However, the project was not continued and many of these proposals have not been implemented.

6. APPLICATION OF CRITERIA/STATEMENT OF SIGNIFICANCE

The site has been nominated for consideration under natural criteria (ii), (iii) and (iv).

Criterion (ii): Ecological processes

The site is a large temperate forest wilderness, with very little human habitation or disturbance. However, no convincing evidence was presented to establish that there were on-going ecological processes of "outstanding universal value" within the site. Central Sikhote-Alin is primarily climax forest, with little evidence of natural perturbation, except for occasional fires from lightening strikes and the inundation of the floodplain of the Bikin River. The Sikhote-Alin zapovednik coastline shows geomorphological evidence of progressively uplifted marine terraces but these are not considered to be linked to outstanding ecological processes. IUCN does not consider that the site meets this criterion.

Criterion (iii): Superlative natural phenomena or natural beauty and aesthetic importance

Although the expanse of wilderness in the nominated area is impressive, the landscapes and scenery of the site are not exceptional. The forest is very difficult to penetrate on foot, the topography is subdued and the natural waterways intricate and subtle, and insect pests are aggressive and ubiquitous during spring and summer (constituting a major disincentive to human settlement and tourism development). IUCN does not consider that

the site meets this criterion.

Criterion (iv): Biodiversity and threatened species

The nominated area is representative of one of the world's most distinctive natural regions. The combination of glacial history, climate and relief has allowed the development of the richest and most unusual temperate forests in the world. Compared to other temperate ecosystems, the level of endemic plants and invertebrates present in the region is extraordinarily high which has resulted in unusual assemblages of plants and animals. For example, subtropical species such as tiger and Himalayan bear share the same habitat with species typical of northern taiga such as brown bear and reindeer. The site is also important for the survival of endangered species such as the scaly-sided (Chinese) merganser, Blakiston's fish-owl and the Amur tiger. IUCN considers that the site meets this criterion.

7. RECOMMENDATION

That the Bureau note that Central Sikhote-Alin is considered by IUCN to meet natural criterion (iv) but that the management of the Bikin River protected areas (Bikin Territory of Traditional Nature Use and Verkhnebikinski zakaznik) need to be improved before this area is inscribed on the World Heritage List. Therefore the Bureau should recommend the **inscription** of the Sikhote-Alin Nature Preserve and Goralij Zoological Preserve but **defer** the inscription of the Bikin River protected areas and request that the State Party:

- develop an effective and integrated collaborative management regime for the entire Bikin catchment with the full involvement of indigenous peoples in this process;
- regulate activities in areas adjacent to the Bikin catchment in both Primorskii and Khabarovskii Krais; and
- improve the physical linkages between the Bikin and the Sikhote-Alin Nature Preserve by urgently developing a comprehensive network of protected areas which can both link the Bikin to the Sikhote-Alin zapovednik and provide a natural corridor to the coastal regions near Svetlaya. This should be carried out within the framework of the system of interlinking protected areas proposed by the *'Biodiversity Conservation Strategy for the Sikhote-Alin'* and fully involve indigenous people in this process.

Once these activities have been completed, the State Party may wish to submit the Bikin protected areas for consideration as a second phase of the nomination.

The Bureau may wish to commend the State Party for responding to the request of the 1996 Bureau and encourage the State Party to request International Assistance from the Committee to fund the necessary technical work to fulfil the above request.

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

RIFT VALLEY LAKE RESERVES (KENYA)

Background Note: The nomination being evaluated here is a reformulated version of the initial "Great Rift Valley Ecosystems" that Kenya submitted in July 2000. The original nomination was for a much larger area which was put forward under natural and cultural criteria. Subsequent to the IUCN field inspection, the Kenyan authorities decided to submit a revised nomination that focuses on three Rift Valley lakes (natural criteria) as well as an extension to the existing Sibiloi/Central Island site (letter to Director of the World Heritage Centre from Director of Kenya Wildlife Service, 25 March, 2001).

1. DOCUMENTATION

i) **IUCN/WCMC Data Sheet:** (10 references).

ii) **Additional Literature Consulted:** McClanahan, T.R. and T.P. Young. 1996. **East African Ecosystems and their Conservation**. OUP; Brown, L. 1971**. East African Mountains and Lakes**. EA Publishing. 122p; Brown, L. 1981. **Africa – A Natural History**; Howard G.W. (ed.) 1997. Conservation of the Lesser Flamingo in E. Africa. Workshop Proceedings. 120p; Engoke, J. 2000. Proposed Integrated Conservation and Development Plan for Lake Bogoia. 28p.; KWS. 2001. Lake Nakuru National Park Integrated Management Plan. Draft 68p.; Njuguna, S. 2000. Conservation and Sustainable Use of Biodiversity in the East Rift Valley Lakes. GEF Report.; Vaucher, C.A. 1973. **Nakuru – Lake of a Million Flamingos**. WWF.; Kear, J. and N. Duplaix-Hall. 1975 **Flamingos**. The Wildlife Trust; Makenzi, P et.al. 2000. Impact of Human Activities on Landscapes and Natural Resources of the Great Rift Valley Lakes. GEF report. 49p.; Myers, N. 1974. The Ecologic/Socioeconomic Interface of Wildlife Conservation in Emergent Africa: Lakes Nakuru and Nawarla. **J. Env. Econ. and Mangt**. + 319-334; Bishop, W.W. 1978. **Geological Background to Fossil Man**. Research in the Gregory Rift Valley. University of Toronto Press; Bennun, L & P. Njorage. 1999. **Important Bird Areas of Kenya**. Birdlife International.

iii) **Consultations:** 5 external reviewers contacted**,** Officials from Kenya Wildlife Service, resident park wardens, IUCN Eastern Africa office staff.

iv) **Field Visit:** February, 2001, Jim Thorsell.

2. SUMMARY OF NATURAL VALUES

The nominated site consists of three separate reserves located in the floor of the Rift Valley: Lake Bogoria National Reserve (10,700ha.); Lake Nakuru National Park (18,800ha.) and Lake Elmenteita Reserve (6,300ha.). All three lakes are shallow, alkaline and endorheic (a lake with no surface outlet). All three lakes are included among the sixty "Important Bird Areas of Kenya" by Birdlife International.

Lake Bogoria National Reserve was gazetted in 1981 and includes the entire lake and it surroundings. The Siracho escarpment rises abruptly from the lakeshore, while on the relatively flat western shore is a series of hot springs and geysers. Terrestrial vegetation is primarily thorny bushland dominated by Acacia, figs, combretum thicket and alkaline-tolerant grasslands. The lake supports a dense growth of green algae (*Spirulina platensis*) which, in turn, is a key feeding ground for the itinerant Rift Valley population of Lesser Flamingos. Congregations of up to 2 million birds have been counted. Three hundred and fifty other bird species also occur as well as a range of typical savannah woodland fauna. The area is known especially for a healthy population of Greater Kudu and also as a staging area for Steppe Eagle as they prepare to migrate to northern Europe.

Lake Nakuru National Park is centred on a very shallow, strongly alkaline lake, with surrounding woodland and grassland. The lake catchment is bounded by Menengai Crater to the north, the Bahati Hills to the north-east, the Lion Hill ranges to the east, Eburu Crater to the south and the Mau escarpment to the west. Nakuru was first

gazetted as a bird sanctuary in 1960 and upgraded to National Park status in 1968. A northern extension to the park was added in 1974. The foundation of the lake's simple food chain is the cyanophyte *Spirulina platensis*, which often occurs as a unialgal bloom. At such times it can support huge numbers of Lesser Flamingos. A small introduced tilapia fish supports a number of secondary consumers. The lake shores are mainly open alkaline mud, with areas of sedge and marsh around the river inflows and springs, giving way to grassland and a belt of Acacia woodland. Rocky hillsides on the park's eastern perimeter area are covered with scrub and *Euphorbia* forest.

Nakuru is internationally famous for its populations of Lesser Flamingo; numbers can reach 1.5 million at times, though drastic and unpredictable fluctuations occur. Nakuru is a very important feeding site for this species but attempts by flamingos to breed here have not been successful. Other waterbirds have increased considerably in numbers and diversity since the introduction of fish in 1961. At times Nakuru is a major feeding ground for Great White Pelicans, which nest on rocky islets in nearby Lake Elmenteita and move to Nakuru daily to feed. Large numbers of Palaearctic waders winter at Nakuru or use the site on passage, and Nakuru (at least in the past) has been a key site in the eastern Rift Valley flyway. Nakuru is rich in birds with 480 species recorded. The park is fenced completely and has a wide range of typical African species such as black rhino (50), white rhino (40), Rothschilds giraffe, lion, leopard, and large numbers of waterbuck, gazelles and Cape buffalo.

Elmenteita is a shallow alkaline lake (maximum depth 1.9m) on the Rift Valley floor some 20km south-east of Nakuru town. It is fed by hot springs at its southern end, and two small streams, the Mereroni and Kariandusi, flowing from the eastern plateau. The surrounding landscape is characterised by dramatic rocky faults, volcanic outcrops and cones. Rainfall is erratic and less than 600mm on average per year. To the east, the lake is flanked by small-scale agriculture, while several large ranches surround the remainder. The northern and south-eastern lakeshores are open and flat, a spectacular cliff rises to the north-east, and the western shores are broken and rocky. The natural vegetation is mainly Acacia bushland interspersed with *Themeda* grassland. Patches of *Acacia xanthophloea* woodland occur near the shore, and formerly covered a large area south of the lake. The lake consistently has internationally important populations of Greater and Lesser Flamingo and Pied Avocet (according to BirdLife International (1999). At least 49 waterbird species are recorded, including 10 Palaearctic migrants. Although it lacks fish, except in the peripheral hot springs, Elmenteita at times is also host to large numbers of Great White Pelicans. Up to 8,000 pairs have bred there when water levels are high and rocky outcrops in the eastern sector are flooded to form islets, on which the birds can safely nest. The pelicans move daily to Lake Nakuru to feed. Greater Flamingos have also bred at Elmenteita in the past, but have been displaced by pelicans in recent years. The adjacent woodland and bushland feature over 400 species of birds.

3. COMPARISONS WITH OTHER AREAS

Within the Great Rift Valley of eastern Africa there are over 300 protected areas (WCMC Database). A number of these centre around alkaline endorheic lakes such as Lake Manyara National Park in Tanzania. Existing World Heritage sites that are found in the Rift Valley (including both the eastern and western rifts) are: Lake Malawi, Virunga, and Sibiloi/Central Island National Parks. Others exist near the Rift but these are the only three within or partially within it. The lakes in Virunga and Malawi are freshwater while Sibiloi/Central Island National Parks are part of Lake Turkara, an alkaline but very deep lake in northern Kenya.

The soda (alkaline) lakes in the Rift Valley of eastern Africa are among the world's most productive natural ecosystems (McClanahan and Young. 1996). A conspicuous feature of these lakes are enormous flocks of lesser flamingos feeding on thick suspensions of blue-green algae. Flamingos exist elsewhere in Africa (Ethiopia, Namibia, South Africa, Uganda) but in nowhere near the concentrations found with the nominated sites, with the exception of Lake Natron in Tanzania during breeding season. The main soda lakes in the region are the three nominated sites as well as Magadi and Logipi in Kenya; Natron and Eyasi in Tanzania and Langano Awass and Abiata-Shala in Ethiopia. The three nominated lakes – Bogoria, Nakuru and Elmenteita are considered the most diverse and most natural and support the largest and most diverse bird populations.

In conclusion, the soda lakes (in contrast to saline lakes) of the Rift Valley of Africa "…are of extraordinary interest and are biologically unique; there is nothing quite like them in the world" (L. Brown, 1971). Within the relatively small size (36,000ha. in total) exists one of the most diverse and spectacular avifaunal assemblages in the world. As summarised more recently in an overview of the soda lakes of the Rift Valley: "Soda lakes in the Rift Valley of eastern Africa are among the world's most productive natural ecosystems. A conspicuous feature of these lakes are enormous flocks of lesser flamingos grazing on the thick green suspensions of algae. In contrast to such prolific biological activity are the harsh physical and chemical conditions and a depauperate

fauna". (J.M. Melack in **East African Ecosystems and their Conservation**. McClanahan and Young eds. 1996)

4. INTEGRITY

4.1. Legal Protection

Each of the three sites is under a different form of protection: Lake Nakuru is a National Park (managed at the national level by the Kenya Wildlife Service); Lake Bogoria is a National Reserve (managed by two local County Councils but under national policy set by Kenya Wildlife Service; and Lake Elmenteita consists of the existing Soysambu Wildlife Sanctuary (private land) also managed under the national policy set by Kenya Wildlife Service and the lake itself which is awaiting gazettement as an addition to Soysambu. Although National Park status for all three sites would be a more ideal form of protection, existing realities of local grazing rights and private land justify the reserve designations for Bogoria and Elmenteita. Nakuru is also a Ramsar site and Bogoria has been proposed.

4.2. Management

Both Nakuru and Bogoria have resident wardens in charge with a sufficient budget and complement of staff. A new management plan for Nakuru is nearing completion and an initial draft has been prepared for Bogoria. Elmenteita does not have a staff person directly responsible as most of the area is under private ownership (except the lake surface which is owned by the government). A local landowners association, however, provides a local management structure and entry is closely controlled. The only exceptions here are some soda and salt extraction (done by hand) along the northwestern shore and grazing by nomadic pastoralists in the south. Preparation of a management plan for the site is in the early stages.

There is no single management authority for the three components of the nomination nor is there a particular need for one as all are under general supervision of the Kenya Wildlife Service in cooperation with three District Councils.

4.3. Boundaries and Justification

Individually each of the three sites has particular and closely related natural values. The lake levels fluctuate greatly and there are strong migratory connections between each of the sites even on a daily basis. All three are thus strongly linked in what could be referred to as a "flamingo system" after the dominant species using the lakes. One major missing link in this system is Lake Natron in Tanzania, the breeding location for the entire flamingo population of up to four million birds. In terms of Conditions of Integrity iv which notes that seasonal breeding and nesting sites for migratory species should be protected, Lake Natron should ideally be nominated for inclusion as part of this serial site. The Kenyan authorities have written the Director of the World Heritage Centre (26 Feb, 2001) to note that "discussions with Tanzania will also be initiated on the protection measures at Lake Natron and the possibility of incorporating that site in future to form a transboundary World Heritage within the Rift Valley Lakes". Meanwhile, Tanzania is considering putting forward Natron as a Ramsar site. Other lakes of secondary but significant importance for flamingos in Kenya are Magadi and Logipi. Neither of these lakes are protected and there are no current proposals to do so. In neither case is birdlife threatened.

4.4. Threats

As evident from the pronounced shifts in species composition and abundance that have occurred in response to natural water level variations, the ecology of the shallow soda lakes is particularly sensitive to hydrologic changes. Although each of the lakes faces a range of management issues, Bogoria and Elmenteita do not face serious threats. In contrast, Nakuru National Park has long been an area where conservation has been in conflict with development. Nakuru is an important and expanding agricultural and industrial centre. It is also a major tourist attraction, with up to 300,000 foreign and local visitors per year. Lake Nakuru town is an important industrial and agricultural centre (500,000 people) whose growth directly affects the lake. Three major rivers, the Njoro, Makalia and Enderit, drain into the lake, together with treated water from the town's sewage works and the outflow from several springs along the shore.Until recently, treatment of waste water entering the lake from the town was inadequate. An expanded sewage treatment works is now in operation but concerns about industrial pollution and surface runoff persist. The Lake Nakuru Conservation and Development Project, supported by WWF, has been working for some years to improve urban environmental standards and encourage

sustainable land-use in the catchment. Nearly half the catchment is now under cultivation, and river flows have reduced markedly while silt loads have risen. This problem will be exacerbated by recent deforestation in the Eastern Mau Forest Reserve which provides the catchment for much of Nakuru's water. Encroachment and settlement in this forest (reportedly by as many as 28,000 people) needs to be reversed and natural vegetation allowed to regenerate, or the lake may have little future.

The lake's ecology, though relatively simple, is fragile. Populations of *Spirulina*, and the invertebrates, fish and flamingos that feed on these species, can only be supported under specific, narrow ecological conditions. Severe declines in waterbird numbers (other than flamingos) since 1993 point to major changes in the food chain – specifically, a lack of fish and invertebrates – associated with a period of low lake levels. Lake Nakuru's levels fluctuate naturally due to little understood interactions between hydrology, meteorology and geology. It is unknown how human pressures may have influenced the natural cycle. The National Park is now entirely surrounded by a 74km electric fence that prevents movements of animals in or out. Large mammal populations in the Park are expanding, and careful management will be needed to avoid ecological imbalances – for instance, giraffe are currently destroying the *Acacia* woodland through de-barking of trees.

Nakuru, thus, is under pressure from threats mostly outside its borders. The management plan now in preparation fortunately takes a regional view and is proposing a number of initiatives within the watershed to better ensure the integrity of the park. Whether or not Nakuru has a future will very much depend on the implementation of measures outlined in this plan. The effectiveness of these measures requires on-going assessment and evaluation.

In summary, IUCN concludes with the following:

- The serial nomination is justified as no one of the three sites on its own would adequately display and protect this unique Rift Valley "flamingo system";

- One major component of this system, however, is missing which is the breeding grounds for the Lesser Flamingo at Lake Natron in Tanzania. The inclusion of Lake Logipi should be investigated in future by the state party;

- Both Nakuru and Bogoria have well-established management regimes while Elmenteita has not advanced to this point as yet; and

- While Bogoria and Elmenteita are not currently under serious threat, Lake Nakuru is facing significant management challenges that will require major efforts to address.

5. ADDITIONAL COMMENTS

A separate report provides an evaluation of the proposed extension of the Sibiloi/Central Island National Park to incorporate South Island National Park. As noted, this has been proposed as a separate site by the State Party.

6. APPLICATION OF CRITERIA/STATEMENT OF SIGNIFICANCE

These three Rift Valley lakes – Bogoria, Nakuru and Elmenteita – are internationally important for three reasons:

Criterion (ii) Ecological Processes

The shallow alkaline endorheic lakes of the Rift Valley are of great scientific interest to limnologists studying the high productivity of these distinct ecosystems. The low species diversity and abundant resident population make soda lakes especially appealing environments in which to conduct investigations of trophic dynamics and ecosystem processes. The production of huge biomass quantities in these distinctive soda lakes and the food chain that this green algae supports are also of international scientific value. IUCN considers that this site meets World Heritage natural criteria ii.

Criterion (iii) Superlative natural phenomena or natural beauty and aesthetic importance

The presence of up to 4 million lesser flamingos which move between the three lakes is an outstanding wildlife spectacle. The natural setting of all three lakes surrounded by the steep escarpment of the Rift Valley and associated volcanic features provides an exceptional scenic backdrop. IUCN considers that this site thus also meets natural criterion iii.

Criterion (iv) Biodiversity and threatened species

Within the relatively small size of each of the Reserves some of the highest levels of bird diversity in the world are recorded. Although the soda lakes themselves do not support an especially diverse fauna, the woodlands and freshwater habitats surrounding them do. Along with the high populations of flamingos that the three lakes support, the site is a critical habitat for a diverse assemblage of other avifauna. IUCN considers that this site meets criterion iv.

In terms of the Conditions of Integrity as provided in the Operational Guidelines, there are three issues of concern:

- Most bird species are migratory (or vagrant) and, in this case, the three lakes do not contain the seasonal breeding and nesting sites for the millions of flamingos that spend most of the year in the nominated site. The breeding area is Lake Natron in Tanzania which, although unprotected, is fortunately not threatened. Discussions between Kenya and Tanzania on protection measures have been initiated.
- One of the three reserves – Lake Nakuru – is under threat from pollution and de-forestation in its catchment basin. If corrective actions are not taken, the water quantity and quality will continue to decline to the point that resident bird populations will suffer large losses. The new management plan and the WWF project are addressing the difficult issue of influencing external urban, agriculture and forestry issues but great efforts will be required to implement corrective measures. This situation needs to be carefully monitored.
- The gazettement process in one of the three reserves in the nomination – Elmenteita – is not yet complete. The existence of a privately owned ranch in the site is a secondary concern despite it being under "Wildlife Sanctuary" status at present. Gazettement is expected soon but the Kenyan authorities still need to clarify the controls this designation has over private land and the adequacy of the legislation. Inscribing the site without including Elmenteita would not be sufficient as it is a key part of the three lake system.

7. RECOMMENDATION

The Bureau noted that this site fulfils criteria (ii), (iii) and (iv). The Bureau decided to refer the nomination back to the State Party for confirmation from the Kenyan authorities of the timing and effectiveness of the Wildlife Sanctuary status for Lake Elmenteita. The Bureau requested the Centre to contact the Kenya Wildlife Service to urge them to complete the process of preparing management plans for each of the three reserves, to underline concerns over threats to Lake Nakuru and to encourage them in their discussions with Tanzania over the need to ensure that Lake Natron receives adequate protection.

The Bureau furthermore encouraged the Tanzanian authorities to enure that Lake Natron receives adequate protection. The Bureau noted that Lake Natron could in the future be considered as an extension to the site as it is important for the integrity of the nominated area.

As at 20 October 2001 IUCN has not received confirmation from the State Party on the Wildlife Sanctuary status of Lake Elmenteita and therefore recommends that the Committee **defer** a decision on the site until this confirmation is available.

WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

CERRADO PROTECTED AREAS: CHAPADA DOS VEADEIROS AND EMAS NATIONAL PARKS (BRAZIL)

Background information: Chapada dos Veadeiros was nominated by Brazil in 2001 and IUCN, in its evaluation report to the June Bureau session, recommended the need to explore the possibility of nominating other relevant sites, which more adequately address the complexity of the cerrado ecoregion. The Bureau noted the high importance of the Cerrado ecoregion for the conservation of biological diversity and the need to enhance representation of this ecoregion in the World Heritage List. The Bureau decided to refer the nomination back to the State Party to prepare a serial nomination including Chapada dos Veadeiros National Park which more adequately addressed World Heritage criteria. In August 2001, the State party submitted a revised serial nomination including Chapada dos Veadeiros National Park and Emas National Park. This evaluation refers to this serial nomination.

1. DOCUMENTATION

i) **IUCN/WCMC Data Sheet: (**12 references).

ii) **Additional References Consulted:** Dinerstein, E. *et. al.* 1995. **A conservation assessment of the terrestrial ecoregions of Latin America and the Caribbean.** Washington D.C.; MMA/Funatura/CI, 1999. **Priority areas for the Conservation of Biodiversity of Pantanal and Cerrado regions.** Brasilia; IBAMA and PROAVES. 1998. **Priority actions for the conservation of biodiversity of Cerrado and Pantanal**, Brasilia; Minister of the Environment, CI and Funatura. 1999. **Plano de Manejo, Parque Nacional da Chapada dos Veadeiros,** Brasilia; Governo do Estado de Goiás. 2000. **Reserva da Biosfera do Cerrado – Fase II**, Goiania; Governo do Estado de Goiás, WWF, and Oficina de Ciências e Artes. 2001. **Área de Proteção Ambiental Pouso Alto**, Goiania; Dardenne, M. D. and J.E. Guimarães Campos. 2000. **Geological and Paleontological Sites of Brazil: Chapada dos Veadeiros National Park, Goiás;** WWF. Ano II - Número III – December, January and February, 2001.**Veadeiros Jornal,** Alto Paraíso**;** WWF. 2001. **Chapada dos Veadeiros: estabelecimento de um projeto integrado de conservação e desenvolvimento no Cerrado (PICD).**

iii) C**onsultations:** 5 external reviewers contacted, National, State and Municipal Government officials, park staff, local NGOs and community representatives.

iv) **Field Visit:** March 2001. Allen D. Putney. August 2001. Pedro Rosabal

2. SUMMARY OF NATURAL VALUES

The Cerrado is the second largest ecoregion in Brazil, after the Amazon basin. Most of the Cerrado ecoregion is located in the Brazilian Highland Central Plateau with a limited portion in Bolivia. This plateau is an ancient, pre-Cambrian geological structure with nutrient-poor and, moderate to highly acid soils. Throughout the Tertiary and Holocene ecological conditions in this region remained stable facilitating the development of a highly specialised flora and fauna. This formation corresponds to the Biogeographic Province of Campos Cerrados (Udvardy, 1975) and ranks among the world's richest in biological diversity. The WWF/World Bank conservation assessment of terrestrial ecoregions of Latin America ranked the Cerrado as "globally significant" The Cerrado flora is species rich, counting up to 350-400 vascular plant species per hectare. Throughout the world only a few tropical rain forests can boast a greater number of vascular plant species per hectare.

The WWF/World Bank conservation assessment also described the ecoregion as "vulnerable" and of the "highest priority for conservation action". Despite its biodiversity importance, much of the Cerrado has been converted to agriculture, cattle ranching and urbanisation. Very few large contiguous areas of undisturbed

natural ecosystems survive. Among the largest of these are the two sites included in this Cerrado Protected Areas (CPA) serial nomination. Both the Chapada dos Veadeiros National Park (CdVNP) and Emas National Park (ENP) are located in the geographical centre of the Brazilian Cerrado Ecoregion, and both are in Goiás State.

CdVNP includes the highest altitude of the Cerrado ecoregion and covers an extension of 235,970ha, which makes it the largest National Park within this ecoregion. CdVNP is surrounded by the Environmental Protection Area (EPA) of Pouso Alto with 872,000ha, which corresponds to IUCN Protected Area Management Category VI (IUCN, 1994). The area covered by CdVNP and Pouso Alto is extremely important in the regional context for maintaining the hydrological regime, as due to its geology and soils characteristics it is a key area for recharging the existing aquifers while contributing to a number of rivers that flow into the Amazon basin. The altitude in CdVNP varies from 400 to over 1,600m. It contains a rich mosaic of cerrado landscapes and habitat types including: wooded savannah; grasslands; scrublands; dense wooded savannah; gallery forest; semi-deciduous forest; wetlands; and exposed rock.

This mosaic of landscapes and habitats, which overlays a variety of geological structures (including some of the oldest rock formations in the world) gives the CdVNP its high biological diversity. Endemism is high in the park, especially in areas above 1,200m. A biodiversity survey conducted in 1997 revealed 1,476 species of vascular plants, 50 of which are rare or endangered. Samples from gallery forest showed 145 species/ha, with are close to the figures in the Amazon Basin. Fauna includes: 45 species of mammals, eight of which are rare or endangered; 306 species of birds, 20 of which are rare or endangered; 49 fish species, of which 38 could not be identified at the species level and are probably highly localised endemics; 34 species of amphibians, of which eight are possibly new species; approximately 1,000 species of moths; and 160 species of native bees of which 6 are new to science. The CdVNP contains populations of several large mammals, including giant anteater, giant armadillo, maned wolf, spotted jaguar and pampas deer. The EPA of Pouso Alto has recently been established (May 2001) to enhance conservation outside the park and so help ensure the long-term viability of these populations.

ENP covers 131,868ha and is located at the northwest of the Brazilian Plateau within the Sierra dos Caipaós. This plateau reaches 880m within the park before it falls south to the Paraná River Basin and the vast inland wetlands of the Brazilian Pantanal, thus conferring on ENP an important regional hydrological function. Compared to CdVNP, the dominant landscape of ENP can appear monotonous with savannah formations (cerrado *sensu stricto*) dominating the area, but there are also important local variations in the vegetation, mainly as a result of soils and hydrological factors. In areas with the richest soils, semi-deciduous forest is found. Results from monitoring and research of the movement of key species in ENP indicates the high importance of this forest for species such as the spotted jaguars, pumas and ocelots. The floristic survey conducted in the open savannah reported 601 species of vascular plants with seven of these being newly-discovered species. According to the findings of CI's biodiversity assessment, the total number of plants for ENP probably should reach over 800 species once the riparian and semi-deciduous forest zones have been fully studied.

ENP has become internationally known for its rich vertebrate fauna. It is considered one of the most important sites for conservation of large mammals in South America and the only national park in the Neotropics where large mammals are easily visible. There are 78 species of mammals reported from ENP, some of which also occur in CdVNP. Endangered species include the maned wolf - considered the Cerrado's flagship species – spotted jaguar, puma, ocelot, giant ant-eater, giant armadillo, giant rat, pampas deer, marsh deer, river otter, agouti, flower bat and short-tailed opossum. Four new species of small mammals were recently discovered in the park, including a rodent and an opossum. According to researchers working on CI's biodiversity assessment of ENP, more new animal species may also be discovered as it is considered that around 30% of the park has not been subject of adequate surveys and systematic research. It is therefore very important to further support biodiversity research at this site, as it would help to better understand the ecology and biodiversity values of the entire cerrado ecoregion.

Of the 354 bird species registered in ENP, 12 are endangered species including the black and white hawk-eagle, the crowned solitary eagle and the yellow-faced amazon parrot. ENP is an important site for bird conservation in the Neotropics, containing many endemic species of specialist grassland birds. This is particularly important in view of the loss of grassland generally in the Cerrado ecoregion. There are 69 reptile species reported for ENP, of which ten are very rare and 15 (22% of the total) are endemic to the Cerrado ecoregion. Four new species of reptiles have recently described for the Cerrado. CdVNP and ENP together account for 84 reptile species but only 25 of them are common to both areas. For the whole Cerrado ecoregion around 110 reptiles species have been reported; the two nominated areas contain a remarkable sample of reptiles (73%) of this ecoregion.

One of the reasons the Cerrado Ecoregion is globally significant is because it is perhaps the oldest of the major tropical ecosystems. Changes in world climate over geological periods have moved central South America's ecosystems south to north and east to west, and back again, several times. Within the Cerrado Ecoregion, CPA is centrally located. Moreover, because of the altitudinal range which occurs in these areas, they are probably the only areas within the Cerrado ecoregion where species and habitats have been able to adjust to climate changes by vertical movement rather than by moving to different longitudes or latitudes. This has permitted the survival of rare and relict life forms, and encouraged the development of a number of endemics that exist in the proposed serial site. Experts in Cerrado ecology predict that CPA is a key site for Cerrado species adapting to climate change. CPA is very important as a base from which key species of fauna can move out to re-populate surrounding areas and remaining "islands" of natural and semi-natural vegetation within the Cerrado ecoregion. This role has been demonstrated in the case of ENP by a Conservation International (CI) biodiversity research programme, designed to help develop a Cerrado-Pantanal biological corridor. While similar research has not yet taken place in CdVNP, it is believed that this site plays a similar role.

3. COMPARISON WITH OTHER AREAS

The Cerrado Ecoregion is partially represented in two existing World Heritage Sites, the Noel Kempff Mercado National Park (NKMNP) in Bolivia and the Pantanal Conservation Complex in Brazil. Both of these areas are on the fringes of the Cerrado while CPA is located in the core of this ecoregion. The Pantanal Conservation Complex includes only small areas of Cerrado, while NKMNP contains a good portion of this kind of ecosystem, thus its more appropriate to compare this serial site with NKMNP. In more general terms, CdVNP can also be compared with Canaima National Park (Venezuela), which includes a large area of tropical savannah (the Gran Sabana) but of different biogeographic characteristics than Cerrado (Los Llanos and Guyanan Biogegraphic Provinces, Udvardy 1975).

NKMNP is a composite of different ecoregions, mainly Amazonian (80% of the site), Cerrado and Chaco. The Cerrado portion is limited to 272,000ha on the Huanchaca Plateau; therefore a proper comparison should be mainly focused on this part of NKMNP. The 540 species of vascular plants reported from the Huanchaca Plateau is relatively few compared to almost 1,500 species recorded in CdVNP alone. Of the 125 mammal species found in NKMNP, only 25 occur in Cerrado habitats compared to the 78 mammal species found in ENP. The habitats and landscapes of the Cerrado, which are protected in NKMNP, are less diverse than those protected in CdVNP. On the other hand, ENP contains the best remaining sample of the Cerrado *sensu stricto*, which is only to be found in Brazil and that it is not at present represented in the World Heritage List.

While there are other protected areas in the Brazilian Cerrado, the nominated site stands out for its exceptional place in conserving the flora, fauna and altitudinal range of this ecoregion. Also, no other protected areas contain an equivalent mosaic of ecosystems; nor are they so representative of the Cerrado. For example Pacaas Novos National Park is an enclave in the Amazonian ecoregion, and Chapada Diamantina National Park contains a mixture of Cerrado and Caatinga ecosystems. Furthermore, other protected areas in the Cerrado ecoregion, such as Brasilia National Park, Chapada dos Guimaraes National Park and Grande Sertao Veredas National Park, suffer from a number of integrity issues and some uncertain land tenure questions that limits the effectiveness of their management.

While the areas forming this serial site contain a variety of geomorphological features that are important to understanding the origin and evolution of the region, these features are not comparable to those of other World Heritage sites inscribed on the World Heritage List under this criterion, for example, Ischigualasto-Talampaya in Argentina.

4. INTEGRITY

4.1. Boundaries:

At the time of the first IUCN evaluation in May 2001, CdVNP covered an area of 65,515ha and IUCN noted the "difficulty in maintaining biodiversity in such a limited area." In May 2001, the Pouso Alto EPA buffer zone for CdVNP was established, the area being a continuation of the existing Cerrado ecosystems protected by CdVNP. This area is well protected from exploitation due to its poor soils and complex relief. Furthermore, in September 2001 a Federal Decree expanded the size of CdVNP to 235,970ha, making CdVNP the largest National Park in the Cerrado ecoregion. The reason for the creation of the Pouso Alto EPA and the extension of the size of the

Park has been to include all important areas required for the long-term survival of key species, particularly large predators.

ENP is almost entirely surrounded by agricultural areas and thus does not have the additional support provided by a buffer zone. However, the management of ENP has been carefully planned so as to avoid impacts from outside, particularly from fires (see point 4.3). Research conducted in the area by the Emas Foundation, revealed that large predators are using this area for feeding and breeding, which is evidence that the size is sufficient to meet the biological needs of these species. This is supported by the rarity of attacks by large predators on cattle outside this area.

4.2. Management

A management plan was prepared for CdVNP in 1998 but has not been fully implemented due to the lack of financial resources. However, the plan is in the process of being reviewed to take account the recently approved extension of the CdVNP. A participatory process to prepare this new management plan has already started. WWF/Brazil and Pro-Nature Foundation (FUNATURA) also support the on-going management of CdVNP. The CdVNP has a relatively small, but highly motivated, staff of two technical staff, including the Park's Director, and three rangers working on-site. Personnel from WWF/Brazil, the Chapada dos Veadeiros Tourist Guide Association and the Flower Collectors Association support the park's staff. This team has built constructive relationships with surrounding communities, which has helped to reduce threats to the park.

The park has adequate infrastructure for management activities with entrance stations, a visitor centre, housing for staff and researchers, guard posts, and trails to major visitor attractions. There are no human inhabitants within the park, and important segments of the local population in the eight surrounding communities are effectively involved with park management activities.

Financing of park management depends on the budget received from IBAMA for operations and park staff salaries funded by the National Treasury. In recent years, the annual budget has varied between US$60,000 and US$120,000. However, a large proportion of this budget is dedicated to salaries and it is not sufficient to maintain and operate the park. The new management plan for this site envisages developing the financial sustainability of CdVNP through revenue generation schemes.

In the case of ENP, a management plan was prepared in 1981 and updated in 1996. IBAMA and Emas Foundation aim to review the existing management plan to incorporate results from on going research projects of ENP's biodiversity. This is planned to begin in December 2001 and will also involve a participatory process, including neighbouring farmers who will be encouraged to develop better agricultural practices that would avoid impacts on ENP. The preparation of the new management plan is also linked to the implementation of the CI project to establish a biological corridor linking the Cerrado ecosystem to the Pantanal. There are two technical staff, including the Park's Director, and six rangers working on-site. In addition between 9 and 11 researchers are permanently working in research projects providing additional support to park management activities.

As in the case of CdVNP, the financing of ENP depends on the budget received from IBAMA for operations and park staff salaries funded by the National Treasury. The annual budget for the ENP has varied between US$40,000 and US$80,000 in recent years. Emas Foundation provides additional funding support for research, which is linked to the implementation of CI's project on the Cerrado-Pantanal biological corridor, funded by USAID. While the park's administration considers the available funding sufficient for key management activities, more is required to support the research programme on ENP biodiversity. There are also emerging challenges related to the potential impact of invasive species to the Park that would certainly require additional funding support.

4.3. Threats

There were a number of threats to CdVNP integrity, mainly related to fires, mining, flower collecting, hunting and uncontrolled tourism. These have been reduced significantly in recent times. This has been accomplished mainly by positive interaction with local communities that at present are actively involved in the conservation and management of this area. Perhaps the most effective strategy has been to give local communities an effective financial stake in the park's tourism activities. The commercial collection of flowers is a major source of income in the region, but considerable effort has been made to divert this activity to areas outside the park where sustainable management practices are pursued.

The main threat to CdVNP is the increasing level of visitation. In the past, uncontrolled public-use damaged a few small areas within the park. However, the closing of access roads and imposition of strict controls have improved this situation. Since 1995, when the monitoring of visitor numbers began, park visitation has varied from 8,000 to 26,000 people per year. Most are from Brasilia, but increasingly visitors come from São Paulo and Rio de Janeiro. Public use is limited to the park's major attractions, which occupy only 2% of the park's area. The focus is on the spectacular rapids, waterfalls, natural pools and canyons of the Preto River. Visitors are not permitted in the park unless accompanied by a guide; there are over 200 self-employed guides in the Chapada dos Veadeiros Guide Association. Their services include interpretation; garbage collection, fire control, trail maintenance and visitor safety, but they have no law enforcement powers. A new plan for park visitation, which is currently under review as part of preparation of the new management plan for CdPVNP, makes provision for: viewing points along the paved highway on the eastern border of the park; a trekking trail that will cross the park from the southeast to the northwest; additional visitor sites; and enhancing the capacity of the guides working in the park. These provisions are intended to manage and control visitation, thus reducing damaging impacts to the park's integrity.

The situation for ENP is quite different. Despite being the only national park in the Neotropics where large mammals are easily visible, the level of visitation is very low: only 60-80 people visit the site annually, most of them specialised visits focused on the charismatic fauna. A key threat to ENP integrity is the impact of fires coming from nearby agricultural areas. After a fire in 1990 that affected almost half the park, the need for a comprehensive fire control programme was highlighted. The fire control programme that is now in place is based on results from research on the role of natural fires in Cerrado's ecology. It is an effective programme and a useful model to apply in other Cerrado parks. No fires affecting the site from nearby agricultural areas have been reported since 1994.

The ecological isolation of ENP – it is almost entirely surrounded by farmland – can also be considered a threat to this site. This has been partially solved through good management practices aimed at reducing impacts coming from surrounding agricultural areas. Moreover, the Emas Foundation, with CI, is implementing a project, which aims to link ENP with other semi-natural areas, mostly state reserves, to develop a Cerrado-Pantanal biological corridor, which would help to overcome the isolation of this site.

Another emerging threat to ENP is the increasing presence of exotic grasses species. It has so far affected only the boundary zone, and is still absent from most of ENP. However, a monitoring system is in place to prevent further invasion, as grass seeds are brought into the park by wind and by animals that move across park boundaries.

4.4. Serial Site

When IUCN evaluates a serial nomination it asks the following questions:

a) What is the justification for the serial approach? The Cerrado ecoregion is the second largest of Brasil after the Amazonian basin. This is a complex ecoregion with a variety of habitat types that are impossible to be represented by a single site but rather by a serial site as CPA. While separated by around 400km both CdVNP and ENP occur in the Brazilian Highland Central Plateau, which is considered the core of the cerrado ecoregion. CPA covers all habitat types identified for the Cerrado and most of the flora and fauna species described for this ecoregion, including a number of endangered species of global significance.

b) Are the separate elements of the site functionally linked? All areas within the cerrado ecoregion have been functionally linked throughout the Tertiary and Holocene and the ecological conditions in this region remained stable facilitating the development of a highly specialised flora and fauna. These linkages still exist as CdVNP and ENP play a key role in the repopulation of cerrado's flora and fauna to the remaining semi-natural areas associated with them. They are also functionally linked in relation to the maintenance of the hydrological regime of the cerrado while also contributing to the Amazon and Pantanal basins.

c) Is there an overall management framework for all the units? The two areas of this site have separate management plans and management regimes. For practical, logistical and financial reasons it is difficult at present to have an integrated management plan for both sites. However, this may be achieved in the near future through the implementation of the proposed projects for the Pantanal-Cerrado Biosphere Reserves and the CI's project to develop a Cerrado-Pantanal Biological Corridor.

5. ADDITIONAL COMMENTS

It is widely believed in the region of CdVNP that the quartz crystals, which are found in the park and surrounding area, are a potent source of bioenergy that has therapeutic and restorative effects on humans. The community of Alto Paraíso, on the eastern boundary of the park, caters to visitors seeking guidance in meditation, enlightenment, and physical and spiritual renewal. They have thus created a specialised niche in the tourism market for "spiritual" tourism. Park management has now recognised the potential and requirements for this specialised form of tourism. Discussions are being held to develop special management arrangements for park visitation by these groups. There is also an effort underway to harness the potential of this type of tourism for developing innovative environmental education and visitor interpretation programmes.

6. APPLICATION OF CRITERIA/STATEMENT OF SIGNIFICANCE

CPA has been nominated under all four natural criteria. IUCN considers that criteria (ii), (iii) and (iv) are most relevant.

Criterion (ii): Ecological processes

CPA has played a key role for millenia in maintaining the biodiversity of the Cerrado Ecoregion. Due it its central location and altidudinal variation, it has acted as a relatively stable species refuge when climate change has caused the Cerrado to move north-south or east-west. This role as a species refuge is ongoing as Earth enters another period of climate change. IUCN considers that the nominated site meets this criterion**.**

Criterion (iii): Site containing superlative natural phenomena or exceptional natural beauty

The CdVNP contains a variety of features, such as waterfalls, cliff faces, inselbergs, and a meteorite crater that are interesting landforms which contribute to the natural beauty of the site. However, these features are not comparable to those existing in other World Heritage sites, such as the Pantanal Conservation Complex in Brazil and Canaima National Park in Venezuela. Moreover, the landscapes of ENP may appear somewhat monotonous and lacking in striking landforms. IUCN considers that the nominated site does not meet this criterion**.**

Criterion (iv): Biodiversity and threatened species

CAS contains samples of all key habitats that characterise the Cerrado ecoregion – one of Earth's oldest tropical ecosystems. It contains over 60% of all floral species and almost 80% of all vertebrate species described for the Cerrado. With the exception of the Giant Otter, all of the Cerrado's endangered large mammals occur in the site. In addition, the site supports many rare small mammals and bird species that do not occur elsewhere in the Cerrado and a number of species new to science have been discovered in CPA. IUCN considers that the nominated site meets this criterion**.**

7. RECOMMENDATION

That the Bureau recommends to the Committee the **inscription** of the Cerrado Protected Areas on the World Heritage list under natural criteria (ii) and (iv). IUCN considers that there is a strong case for including the "buffer zone" of CdVNP (Pouso Alto EPA) within the site, as this area shares key natural values of CdVNP and adds substantially to its protection.

The Committee may also wish to request the State Party:

- To provide additional support to CdVNP so as to help finalise and implement the revised management plan for the enlarged site. This plan should give particular attention to issues of tourism and visitor management. The State Party, if it wishes to do so, should consider making a request for assistance from the World Heritage Fund to support this process;

- To further encourage and support the development and implementation of the project for the Cerrado and Pantanal Biosphere Reserves that would help to promote an implement an overall management framework for CPA;

- To further encourage and support the development and implementation of the CI project to establish a Cerrado-Pantanal biological corridor which, in the medium and long-term, would help to overcome the relative isolation of Emas National Park, and;

- To provide greater support to the research programmes underway in ENP.

WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

FERNANDO DE NORONHA ARCHIPELAGO/ROCAS ATOLL TROPICAL INSULAR COMPLEX (BRAZIL)

Background information: Fernando de Noronha National Marine Park was nominated by Brazil in 2000. IUCN in its evaluation report (2000) noted "*Fernando de Noronha National Marine Park has been nominated for inscription on the World Heritage List on the basis of all four natural criteria. The information that is provided in the nomination document is not sufficient to justify inscription*." The World Heritage Committee, as its twenty-fourth session in Cairns, Australia (December 2000), noted that the State Party requested postponement. In February 2001 the State Party submitted a serial nomination of Fernando de Noronha/Atoll das Rocas Tropical Insular Complex. This evaluation refers to this serial nomination.

1. DOCUMENTATION

i) **IUCN/WCMC Data Sheet:** (10 references).

iii) **Additional Literature Consulted:** Bibby *et al*, 1992. **Putting Biodiversity on the Map. Priority Areas for Global Conservation.** Cambridge, UK; Stattersfield *et al*, 1998. **Endemic Birds Areas of the World: Priorities for Biodiversity Conservation.** Cambridge, UK; Biodiversity Support Program, Conservation International *et al*, 1995. **A Regional Analysis of Geographic Priorities for Biodiversity Conservation in Latin America and the Caribbean.** Washington, DC; IUCN Tropic Forest Program/ World Conservation Monitoring Centre, 1998. **Brazil, Atlantic Coastal Forests: Conservation of Biological Diversity and Forest Ecosystems**; Davis, S.D. *et al* **Centres of Plant Diversity.** Vol. 3. IUCN Gland, Switzerland; Prance, 1987. Biogeography of neotropical plants. In **Biogeography and Quaternary History in Tropical America**. Whitmore and Prance, (eds) pp 46-65. Oxford: Clarendon Press; Kikuchi, R.K.P and Z.M.A.N. Leão, 1997. Rocas: An Atoll built primarily by coralline algae. In **Proceedings of the 8th International Coral Reef Symposium**, Vol.1, pp 731-736. UNEP/IUCN. 1998. **Coral Reefs of the World.** Vol. 1: Atlantic and Eastern Pacific. IUCN Gland, Switzerland and Cambridge, UK; GBRMPA/WB/ IUCN, 1995. **A Global Representative System of Marine Protected Areas.** Vol. 2: Wider Caribbean, West Africa and South Atlantic. Washington DC, USA; Elder, D. E. and Pernetta, J. eds., 1991. **Oceans.** London, UK; Sanches, T. M. and Bellini, 1998. C. Juvenile *Eretmochelys imbricata* and *Chelonia mydas* in the Archipelago of Fernando de Noronha, Brazil. In **Chelonian Conservation and Biology**, Vol.3, No.2. pp 308-311, Washington DC, USA.

iv) **Consultations:** 4 external reviewers, Fernando de Noronha National Marine Park, IBAMA, Secretary for the Environment of Pernambuco State, TAMAR Regional Project, Local Community Council, Local Association of Fishermen, Local Association of Tourism Operators, Aguas Claras Dive Centre, Golfinhos Rotadores Project.

v) **Field Visit:** Pedro Rosabal, February 2000 and August 2001.

2. SUMMARY OF NATURAL VALUES

This serial nomination includes Fernando de Noronha National Marine Park (FNNMP) and Atoll das Rocas Biological Reserve (AdRBR). These sites (FNNMP/AdRBR) are located in the Western South Atlantic Ocean, off the northeastern coast of Brazil (see Map 1). FNNMP, under the jurisdiction of the State of Pernambuco, includes a terrestrial area of 1,190ha, comprised of 70% of the main island of Fernando de Noronha, (excluding the island's urban nucleus), as well as 21 smaller offshore islands and islets. The marine area of FNNMP covers 9,580ha and is surrounded by a buffer zone that extends to the 2,000m isobar (see Map 2). AdRBR, approximately 150km to the west of FNNMP, is under the jurisdiction of the State of Rio Grande do Norte. AdRBR is an elliptical reef that includes two small islands, the 3.5ha Lighthouse Island (Ilha do Farol) and 3.2ha

Cemetery Island (Ilha do Cemitério). The marine part of this Biological Reserve covers around 7,500ha and it is surrounded by a buffer zone that extends to the 2,000m isobar (see Map 3).

The nominated site is located on the Southern Atlantic submarine ridge. The Fernando de Noronha Archipelago represents the emerged peaks of this submarine mountain system that rises 4,000m from the ocean floor to an altitude of 323m ASL at Morro do Pico on the main island of Fernando de Noronha. Atoll das Rocas has been formed by the growth of reefs on the submerged peaks of the submarine ridge. Coralline algae have been the primary builders of the das Rocas with secondary deposition by coral. The site represents the first record of coralline algae as primary reef builders during the Quaternary period. It is also the only atoll in the South Atlantic Ocean and one of the smallest in the world. The coastline of FNNMP alternates between high cliffs and sandy beaches and its geology is characterised by a number of volcanic rock types, including pyroclastic deposits of tufa and breccia, lavas and formations such as volcanic plugs, dykes and domes.

There are less than ten oceanic island sites in the South Atlantic and FNNMP/AdRBR represents more than 50% of the ocean's islands in terms of surface area. The highly productive coastal waters around islands are used by many fish species for spawning and as a refuge for juvenile fish. The shallow waters also provide habitat for benthnic organisms (such as coral, sponges and algae). Oceanic islands therefore play a key role in the reproduction and dispersal of marine organisms, providing a staging point for the colonisation of other coastal areas and the surrounding ocean. Since FNNMP/AdRBR represents such a large proportion of insular South Atlantic coastal area, it is an important repository for the maintenance of biodiversity for the entire South Atlantic basin.

FNNMP vegetation is classified as Insular Atlantic Forest – a sub-type of Atlantic Rainforest which is considered the world's most threatened tropical forest. Insular Atlantic Forest is only found in FNNMP. To date over 400 species of vascular plants have recorded in FNNMP, including three endemics. FNNMP also contains the sole oceanic mangrove in the South Atlantic. The vegetation on Atoll das Rocas is mainly herbaceous, salt-resistant, and typical of sandy beaches where *Cyperaceae*, *Gramineae* and *Amaryllidaceae* species are predominant.

The nominated site contains the largest concentration of tropical seabirds, in terms of numbers and species diversity, to be found in the Western Atlantic. 55 migratory species have been recorded in FNNMP, 14 of which breed in the Park. Resident bird species include six natives, three of which are locally endemic, including the Noronho vireo or "sebito". The archipelago is considered a Global Centre of Bird Endemism (BirdLife International, 1998). In AdRBR 32 species have been recorded, of which 11 species regularly nest on the atoll. Approximately 150,000 birds utilise the atoll, including the largest South Atlantic colonies of sooty terns, brown noddies and masked boobies. Based on the diversity and number of individuals, AdRBR is considered the single most important site for tropical seabirds in the whole Atlantic (BirdLife International, 1998).

There is an abundance of marine fauna in the nominated area. Two species of marine turtles breed in the site: the hawksbill turtle – the world's second most threatened species – and the green turtle. AdRBR is considered Brazil's second largest reproductive area for green turtles after Trinidade Island. 15 species of coral have been recorded of which six are endemic to Brazil. 95 species of fish have been reported in FNNMP – including two species endemic to the archipelago – while 147 species of fish have been recorded from AdRBR. Research undertaken by the Brazilian Marine Turtles Conservation Project (TAMAR) indicates that AdRBR is an important feeding ground for juvenile hawksbill and loggerhead sea turtles during their migration to the Eastern Atlantic coast of Africa.

FNNMP has important scenic values associated with its diversity of coastal landscapes and their combination with an impressive gradient of colours of the surrounding waters. On the other hand AdRBR offers spectacular scenes associated with the tide regime. At high tide only two sandy islands and some isolated rock formations in the surrounding reef stand above water. The scene changes dramatically at low tide when the reef ring of the Atoll – a natural 1.5m wall bordered by several sandbanks – is exposed and several shallow lagoons and tidal pools are formed producing a spectacular and colourful landscape. In addition, large numbers of fish get trapped in tidal pools, transforming the atoll into a natural aquarium of great beauty. Underwater both sites present the best diving conditions of the South Atlantic and are considered among the 10 top diving sites of the world. This relates to the abundance of big fishes and sharks, the variety of submarine forms, and an exceptional visibility up to 50m and a light extinction depth of 87m.

A significant natural feature of the site is the concentration of spinner dolphins in FNNMP. This species is commonly found in tropical oceans and is included in the category "insufficiently well-known but dependent on Conservation" in the IUCN Red List. Almost very morning, between 1000 and 1200 spinner dolphins come to

the waters of the Golfinhos Bay in FNNMP to rest up before returning to the ocean at night to feed. This high concentration of spinner dolphins in a relatively small area is an interesting natural phenomenon that attracts the attention of scientists and divers worldwide. Spinner dolphins marked in FNNMP have also been seen in AdRBR. Coloured dolphins, regular dolphins, flippers, melon-head dolphins, pilot whales, minke whales and humpback whales have also been recorded in the nominated area.

3. COMPARISON WITH OTHER AREAS

The nominated area is a biogeographic province of its own – Fernando de Noronha Island Biogeographic Province. According to the classification of Marine and Coastal Realms, the site falls within the Tropical Coastal Realm of the South Atlantic Marine Region. There are no World Heritage sites in either of these biogeographic regions.

Representing a submarine volcanic mountain system, FNNMP/AdRBR may be compared to other Atlantic volcanic islands such as Ascension, St. Helena, and Trinidade. However, its higher biodiversity and the occurrence of Insular Atlantic Rainforest, only to be found in this site, differentiate the nominated area from these islands. Moreover these other Atlantic volcanic islands have been substantially transformed by development and do not enjoy the degree of protection of FNNMP/AdRBR. There are a number of volcanic island World Heritage sites in the Pacific, such as the Galapagos (Ecuador), Cocos Island (Costa Rica) and Hawaii Volcanoes (USA) and East Rennell (Solomon Islands). The differences in oceanography and marine biodiversity between the two oceans make it difficult to compare these sites to the nominated area. This is also the case for Aldabra Atoll (Seychelles) in the Indian Ocean. However, in terms of flora, FNNMP with 400 species is more diverse than Cocos Island (235) and Aldabra Atoll (178).

Though Cocos Islands, Galapagos and the New Zealand Sub-Antarctic Islands have greater numbers of seabirds, the nominated area has relatively high seabird numbers when compared other Southern Atlantic sites such as Gough Island, or to other sites in the Tropical Coastal Realm of the South Atlantic Marine Region. In terms of fish species, Cocos Island has a greater diversity than the nominated area. However, FNNMP/AdRBR has larger populations of some shark species, particularly the lemon shark, than Cocos Island which is important for hammerhead and white-tip sharks. The lemon shark is the subject of ongoing research in AdRBR due to the presence of an increasing resident population, in contrast with the population depletion that is occurring in the Eastern Pacific and West Atlantic. In addition Cocos Islands and Galapagos Islands do not show the ecological linkages that the nominated site has in relation to the survival of marine turtles, dolphins, sharks and other marine species.

FNNMP has important scenic values related to the combination of high cliffs alternating with sandy beaches and an impressive gradient of colours in the sea around the archipelago. However, this is not as impressive as the scenery offered by Cocos Islands with its precipitous forest-covered slopes and waterfalls, or when compared with Hawaii, Galapagos or Gough Island. The scenic values associated to the pristine landscape of AdRBR, as described in section 2, are very high and so peculiar that they can stand by their own in comparison with other world heritage sites. A distinct feature of this nomination is the presence in FNNMP of a resident population of spinner dolphins. The only other known resident population occurs in Kealake'akua Bay, in Hawaii. The population in the nominated site exhibits a well-defined pattern of activity, including nightly feeding in deep ocean waters and AdRBR, followed by a return to Baía dos Golfinhos to rest. The dolphins arrive at the Bay with a remarkable punctuality, between 07:00-07:30hrs each morning and their arrival is spectacular due to the high number of individuals. This is one of the main attractions for visitors who can watch this phenomenon from the high cliffs surrounding the bay. According to the well-known underwater photographer and explorer Tim Burton "there is no other place in the world where you can see such a high concentration of dolphins in such a small area".

In sum, FNNMP/AdRBR has a number of features which differentiate it from other Island World Heritage sites. Being a Biogeographic Province on its own, as well as a Global Centre of Bird Endemism also makes this site quite distinctive.

4. INTEGRITY

4.1. Boundaries:

The terrestrial and marine components of the nominated area are well protected. The boundaries of the nominated area are considered adequate for conserving marine biodiversity. On the main island of Fernando de Noronha all key terrestrial habitats are included in the park and all the terrestrial areas of Atoll das Rocas are within the core zone of the protected area.

4.2. Management:

FNNMP/AdRBR has adequate legal protection from a number of Federal and State laws and regulations. IBAMA is the Federal Agency responsible for the management and conservation of the site. The site has two separate management plans, one for FNNMP and one for AdRBR. The management plan for FNNMP was prepared in 1990 that is being implemented with local government and IBAMA financial support. This plan is adequate and its implementation well resourced and supported by local people. The plan strictly controls tourism developments and visitation. Regulations also control migration to the main island so that the population cannot rise above the present level of 2,500 people. Commercial fisheries are forbidden but traditional fisheries are allowed subject to licenses and regulations. Licenses are granted only to the families of traditional fishermen. A management plan for AdRBR was prepared in 1992 and is under implementation. As only researchers are allowed visit AdRBR and all fisheries are strictly prohibited, the management plan is mainly focused on enforcement, research and monitoring activities.

FNNMP is patrolled by 11 rangers equipped with four vehicles and a speedboat. TAMAR also actively participates in management providing staff for land patrols and permanent observation points overlooking waters around the main island. A good relationship exists between the park and the local community and many local individuals and organisations such as divers, fishermen and tour operators assist park staff in monitoring for illegal activities. The combined efforts of the Park Administration, TAMAR and the local people provide a remarkable successful partnership to control and patrol this site. The Marine Park Authority and the District Council for the Environment actively promote the active participation of local people in conservation activities. In AdRBR there are two permanent staff whose monitoring efforts are assisted by the 3-4 researchers on the atoll. AdRBR staff are supported by the Brazilian navy who help maintain the base on the atoll. The navy also provides immediate backup with planes or coastguard boats when illegal fishing boats are reported.

The Federal Government provides a management budget of US$80,000 per year for FNNMP and around US$30,000 for AdRBR. Both sites receive additional funding for specific projects or conservation initiatives from the Ministry of the Environment's National Environment Fund. FNNMP receives additional funding from a Visitor's Tax and entrance fees. The level of funding and additional support is considered to be adequate for the management of the site.

4.3. Tourism

While tourists are not permitted in AdRBR, FNNMP is one of the most visited parks in Brazil (400,000 visitors in 2000) with diving being a big attraction. Regulations restrict the number of visitors to the main island to a maximum of 420 per day and the importation of non-recyclable material. The Regulations also restrict the amount of tourist accommodation on the island to its current level of approximately 1000 beds. Following the 2000 IUCN visit to FNNMP, the Sustainable Development and Ecotourism Management Plan has been finalised and is under implementation. The plan also covers the area outside FNNMP, the urban nucleus of the main island, which is subject to strict environmental regulations. This plan addresses the carrying capacity of different zones within the park and regulates boating and diving.

A good network of trails and well trained local guides help to reduce visitor impact. Annual training courses for local guides and diving operators are organised by tourism agencies with the support of IBAMA and the TAMAR Project. WWF-Brazil also provides technical and financial support for communication and interpretation. An interpretation centre is located on the main island and all visitors are requested to attend a presentation on FNNMP, which explains regulations and management. As nature-based tourism is the main source of income for local people there is a genuine interest in conserving the area's natural values. Tourism in FNNMP is well regulated and managed and IUCN did not detect any adverse impacts from tourist activities in the park.

4.4. Threats

Given the location of the site and its effective management and regulation there are few threats to its integrity. There is a potential threat from oil spills, however, this is considered very low. The port on Fernando de

Noronha island is well equipped to deal with accidents and existing shipping lanes are located far from the site where oceanic currents would disperse oil or waste before it could reach the site.

4.5. Serial Site

When IUCN evaluates a serial nomination it asks the following questions:

a) What is the justification for the serial approach? Though separated by 150km, both clusters occur on the Southern Atlantic submarine ridge. Together they represent more than half of the insular Southern Atlantic and are extremely important for the dispersion of benthnic larvae and the maintaining and re-population of fish stock in the surrounding oceanic waters.

b) Are the separate elements of the site functionally linked? There is a clear connection between FNNMP and AdRBR in relation to biological and ecological processes. The benefits from sharing the same marine currents and oceanographic regime that influence the ecological processes occurring in both sites. They are clearly linked in an ecological corridor on which a number of species such as marine turtles, dolphins, and sharks survival depends. In the case of marine turtles the linkages go beyond the South Atlantic as these species use this site in their migration to the Western Coast of Africa.

c) Is there an overall management framework for all the units? The two clusters of this site have separate management plans and management regimes. For practical and logistical reasons it is difficult to have an integrated management plan for both sites are they respond to different management objectives (FNNMP is a Category II protected area while AdRBR is a Category Ia protected area according to IUCN, 1994). However they do implement in a coordinated way a number of research projects on key species such as marine turtles, sharks and birds.

5. ADDITIONAL COMMENTS

FNNMP has an interesting history of human occupation represented by a number of sites within the park. The archipelago was once of strategic importance for controlling access to Brazil which prompted the construction of a system of fortresses -- nine of them on the main island. Considering the limited size of the main island – 17 km^2 – this is probably the highest density of military construction worldwide. Also of cultural value is São Miguel Palace, formerly the administration centre of the penitentiary, but now housing the administrative headquarters of the State District of Fernando de Noronha. In AdRBR there are a number of shipwrecks around the atoll of great interest for underwater archaeology. Some of them have been partially studied and mapped but much more work remains to be done.

6. APPLICATION OF CRITERIA/STATEMENT OF SIGNIFICANCE

This serial site has been nominated for inscription on the World Heritage List on the basis of all four natural criteria.

Criterion (i): Earth's history and geological features.

FNNMP/AdRBR represents volcanic islands that are the surface manifestation of a submarine mountain system but is does not represent the process of formation of this system. There are many volcanic World Heritage island sites so the nominated are cannot be considered unique in this respect. Atoll das Rocas is a good example of an atoll constructed primarily by coralline algae in the Quaternary period. It is also the only atoll in the South Atlantic Ocean and one of the smallest in the world. However, there are existing atoll World Heritage sites and there are sites in the Pacific Ocean which would better represent this phenomenon. The site also has ongoing coastal geomorphological processes but these are common to coastal zones throughout the world. IUCN considers that the nominated serial site does not meet this criterion.

Criterion (ii): Ecological processes.

FNNMP/AdRBR represents over half the insular coastal waters of the Southern Atlantic Ocean. These highly productive waters provide feeding ground for species such as tuna, billfish, cetaceans, sharks, and marine turtles as they migrate to the Eastern Atlantic coast of Africa. An oasis of marine life in relatively barren, open ocean,

the islands play a key role in the process of reproduction, dispersal and colonisation by marine organisms in the entire Tropical South Atlantic. IUCN considers that the nominated site meets this criterion.

Criterion (iii): Superlative natural phenomena or exceptional natural beauty.

Baía dos Golfinhos is the only know place in the world with such a high population of resident dolphins and Atoll das Rocas demonstrates a spectacular seascape at low tide when the exposed reef surrounding shallow lagoons and tidal pools forms a natural aquarium. Both sites have also exceptional submarine landscapes that have been recognised worldwide by a number of specialised diving literatures. IUCN considers that the nominated site meets this criterion.

Criterion (iv): Biodiversity and threatened species.

FNNMP/AdRBR is a key site for the protection of biodiversity and endangered species in the Southern Atlantic. Providing a large proportion of the insular habitat of the South Atlantic, the site is a repository for the maintenance of marine biodiversity at the ocean basin level. It is important for the conservation of endangered and threatened species of marine turtles, particularly the hawksbill turtle. The site accommodates the largest concentration of tropical seabirds to be found in the Western Atlantic Ocean, and is a Global Centre of Bird Endemism. The site also contains the only remaining sample of the Insular Atlantic Forest and the only oceanic mangrove in the South Atlantic region. IUCN considers that this serial nomination meets this criterion.

7. RECOMMENDATION

That the Bureau recommends to the Committee the **inscription** of Fernando de Noronha Archipelago/Atoll das Rocas Insular Complex on the World Heritage List under natural criteria (ii), (iii) and (iv). The Bureau may also wish to recommend that the State Party take steps to control potentially adverse activities in the ecological corridor between the two island components of the site. IUCN would like also to recommend that, for easy reference, this site be inscribed under the name of the Brazilian Atlantic Islands.

WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

ALEJANDRO DE HUMBOLDT NATIONAL PARK (CUBA)

Background note: The IUCN technical evaluation of Alejandro de Humboldt National Park (AHNP), nominated by Cuba in 1999, was presented to the twenty-third session of the Bureau in July 1999. Based on IUCN's advice the Bureau adopted the following recommendation:

"The Bureau noted that Alejandro de Humboldt National Park is considered to meet natural criteria (ii) and (iv) but decided to defer the nomination to allow approval of the law expanding the Park and approval of an expanded boundary which links the currently isolated core zones. Until this law and this boundary is in place, the integrity of the site cannot be guaranteed."

ADDITIONAL INFORMATION

IUCN has received a copy of recently approved legislation (Accord No. 3880 of the Executive Committee of the Council of Ministers, 1 February 2001), which establishes of a number of new protected areas as part of the development of the National Protected Areas System of Cuba. The legislation includes provisions for the expansion of AHNP. IUCN has also received a detailed map of the expanded park (see Map 1). The new boundaries link the core zones (Cupeyal-Ojito de Agua Sector and the Jaguaní Sector) which were separated from each other at the time of the 1999 nomination. The new boundaries also encompass a marine and coastal component; thus the expanded park covers a range of ecosystems from the sea to some of the highest peaks in eastern Cuba. IUCN considers that the expanded boundaries adequately respond to the Bureau's concerns on the integrity of this site.

APPLICATION OF CRITERIA/STATEMENT OF SIGNIFICANCE

Criterion (ii): Ecological processes

The size, altitudinal diversity, complex lithologies, and landform diversity of AHNP have resulted in a range of ecosystems and species unmatched in the Insular Caribbean. It was a Miocene-Pleistocene refuge site, particularly in the glacial eras, for the Caribbean biota. The fresh water rivers that flow off the peaks of the park are some of the largest in the insular Caribbean and because of this have high freshwater biological diversity. Because of the serpentine, peridotite, karst and pseudokarst geology of the region, AHNP is an excellent example of ongoing processes in the evolution of species and communities on underlying rocks that pose special challenges to plant survival.

Criterion (iv): Biodiversity and threatened species

AHNP contains the most important and significant natural habitats for in-situ conservation of terrestrial biological diversity in the entire insular Caribbean. It contains 16 of 28 plant formations defined for Cuba, the largest island in the Caribbean, which is a unique biogeographic province. It is one of the most important sites for conservation of endemic flora in the entire Western Hemisphere – nearly 70% of the 1,302 spermatophytes already described, of an estimated total of 1,800-2,000, are endemic to the park. AHNP is one of the most biologically diverse terrestrial tropical ecosystems in an island setting anywhere on earth. Endemism rates for vertebrates and invertebrates found in the park are also very high. Many of these are threatened because of their small range. Because of their uniqueness and the fact that they represent unique evolutionary processes, they are of outstanding universal value from the point of view of science and conservation.

RECOMMENDATION

That the Bureau recommend to the Committee that Alejandro de Humboldt National Park be **inscribed** on the World Heritage List under natural criteria (ii) and (iv). The Committee may also wish to recommend that the

State Party consider requesting Technical Assistance to finalise the management plan for this site, taking into account the conservation requirements of the extended boundaries.