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

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United Nations Educational, Scientific and Cultural Organization

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* Note 1: The evaluation of France – Pitons, cirques et remparts de l'Île de la Réunion was also carried out for the 33rd Session of the Committee, however consideration of this nomination has been postponed until the 34th Session (2010) at the decision of the State Party.

** Note 2: all three mixed properties listed under B1 are also nominated as cultural landscapes.

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THE WORLD HERITAGE CONVENTION

IUCN TECHNICAL EVALUATION REPORT OF WORLD HERITAGE NOMINATIONS

May 2009

1. INTRODUCTION

This technical evaluation report of natural and mixed properties nominated for inclusion on the World Heritage List has been conducted by the Programme on Protected Areas (PPA) of IUCN (International Union for Conservation of Nature). PPA co-ordinates IUCN's input to the *World Heritage Convention*. It also works closely with IUCN's World Commission on Protected Areas (WCPA), the world's leading expert network of protected area managers and specialists, and other Commissions, members and partners of IUCN.

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 properties as "flagships" for 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. The WCPA network now totals 1600 protected area managers and specialists from 140 countries. In addition, PPA has called on experts from IUCN's other five Commissions (Species Survival, Environmental Law, Education and Communication, Ecosystem Management, and Environmental, Economic and Social Policy), from international earth science unions, other IUCN Global Programmes, and 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.

These networks allow for the increasing involvement of regional natural heritage experts and broaden the capacity of IUCN with regard to its work under the *World Heritage Convention*. Reports from field missions and comments from a large number of external reviewers are comprehensively examined by the IUCN World Heritage Panel. PPA then prepares the final technical evaluation reports which are presented in this document and represent the corporate position of IUCN on World Heritage evaluations. IUCN has also placed emphasis on providing input and support to ICOMOS in relation to those cultural landscapes which have important natural values. During 2008 IUCN has extended its cooperation with ICOMOS, including coordination in relation to the evaluation of mixed sites and cultural landscapes. IUCN and ICOMOS have also agreed coordination of their panel processes to further enhance their response to this request of the World Heritage Committee, which will take effect for the 2009-10 cycle of evaluations.

In 2005, IUCN commissioned an external review of its work on World Heritage evaluations, which was carried out by Professor Christina Cameron and resulted in a number of recommendations to improve IUCN's work. The review and the IUCN management response are available on IUCN's website (www.iucn.org/wcpa). A progress report on the implementation of the review's recommendations was examined by the IUCN World Heritage Panel in December 2008 and indicated that IUCN has continued to progress in the implementation of all proposed recommendations. Notable in 2008-09 has been the enhancement of the regional representation on the IUCN World Heritage Panel. IUCN has invested significantly since 2007 with its own resources in strengthening its work on World Heritage, with an overall financial contribution of c.USD 500,000 towards the position of an IUCN Special Adviser on World Heritage. Further enhancements to IUCN work on World Heritage require significant additional funding, both from the World Heritage Fund and other partners and agencies.

2. EVALUATION PROCESS

In carrying out the technical evaluation of nominations IUCN is guided by the *Operational Guidelines to the World Heritage Convention*. The evaluation process is carried out over the period of one year, from the receipt of nominations at IUCN in April and the submission of the IUCN evaluation report to the World

Heritage Centre in May of the following year. The process (outlined in Figure 1) involves the following steps:

1. **Data Assembly**. A standardised data sheet is compiled on the nominated property by UNEP's World Conservation Monitoring Centre (UNEP-WCMC), using the nomination document, the World Database on Protected Areas and other available reference material.

2. **External Review**. The nomination is sent to independent experts knowledgeable about the property or its natural values, including members of WCPA, other IUCN specialist commissions and scientific networks or NGOs working in the region (approximately 130 external reviewers provided input in relation to the properties examined in 2008 / 2009).

3. **Field Mission**. Missions involving one or more IUCN and external experts evaluate the nominated property on the ground and discuss the nomination with the relevant national and local authorities, local communities, NGOs and other stakeholders. Missions usually take place between May and November. In the case of mixed properties and certain cultural landscapes, missions are jointly implemented with ICOMOS.

4. **IUCN World Heritage Panel Review**. The IUCN World Heritage Panel meets at least once per year, usually in December at IUCN Headquarters in Switzerland to examine each nomination. A second meeting or conference call is arranged as necessary, usually in the following March. The Panel intensively reviews the nomination dossiers, field mission reports, comments from external reviewers, the UNEP-WCMC data sheets and other relevant reference material, and provides its technical advice to IUCN on recommendations for each nomination. A final report is prepared and forwarded to the World Heritage Centre in May for distribution to the members of the World Heritage Committee.

5. **Final Recommendations**. IUCN presents, with the support of images and maps, the results and recommendations of its evaluation process to the World Heritage Committee at its annual session in June or July, and responds to any questions. The World Heritage Committee makes the final decision on whether or not to inscribe the property on the World Heritage List.

It should be noted that IUCN seeks to develop and maintain a dialogue with the State Party throughout the evaluation process to allow the State Party every opportunity to supply all the necessary information and to clarify any questions or issues that may arise. For this reason, there are three occasions at which IUCN may request further information from the State Party. These are:

- **Before the field mission** – IUCN sends the State Party, usually directly to the person organising the mission in the host country, a briefing on the mission, in many cases raising specific questions and issues that should be discussed during the mission. This allows the State Party to prepare properly in advance;

- **Directly after the field mission** – Based on discussions during the field mission, IUCN may send an official letter requesting supplementary information before the IUCN World Heritage Panel meets in December, to ensure that the Panel has all the information necessary to make a recommendation on the nomination; and

- **After the IUCN World Heritage Panel** – If the Panel finds some questions are still unanswered or further issues need to be clarified, a final letter will be sent to the State Party requesting supplementary information by a specific deadline. That deadline must be adhered to strictly in order to allow IUCN to complete its evaluation.

Note: If the information provided by the State Party at the time of nomination and during the mission is adequate, IUCN does not request supplementary information. It is expected that supplementary information will be in response to specific questions or issues and should not include completely revised nominations or substantial amounts of new information.

In the technical evaluation of nominated properties, the Udvardy Biogeographic Province concept is used for comparison of nominations with other similar properties. This method makes comparisons of natural properties more objective and provides a practical means of assessing similarity at the global level. At the same time, World Heritage properties are expected to contain special features, habitats and faunistic or floristic peculiarities 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 properties are to be selected solely on this criterion. In addition, global classification systems, such as Conservation International Biodiversity Hotspots, WWF Ecoregions, Birdlife International Endemic Bird Areas, IUCN/WWF Centres of Plant Diversity and the IUCN/SSC Habitat Classification, and the 2004 IUCN/UNEP-WCMC Review of the World Heritage Network are used to identify properties of global significance. The guiding principle is that World Heritage properties are only those areas of

outstanding universal value.

Finally, 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 several other publishers. These include (1) Reviews of Protected Area Systems in Africa, Asia and Oceania; (2) the four volume directory of Protected Areas of the World; (3) the six volume Global Biodiversity Atlas series; (4) the three volume directory of Centres of Plant Diversity; (5) the three volume directory of Coral Reefs of the World; and (6) the four volume synthesis on "A Global Representative System of Marine Protected Areas". These documents together provide system-wide overviews which allow comparison of the conservation importance of protected areas throughout the world.

3. THE IUCN WORLD HERITAGE PANEL

Purpose: The Panel advises IUCN on its work on World Heritage, particularly in relation to the evaluation of World Heritage nominations. The Panel normally meets once a year for a week in December. Depending on the progress made with evaluations, and the requirement for follow up action, a second meeting or conference call in the following March may be required. Additionally, the Panel operates by email and/or conference call, as required.

Functions: A core role of the Panel is to provide a technical peer review process for the consideration of nominations, leading to the formal adoption of advice to IUCN on the recommendations it should make to the World Heritage Committee. In doing this, the Panel examines each available nomination document, the field mission report, comments from external reviewers and other material, and uses this to help prepare IUCN's advice, including IUCN recommendations relating to inscription under specified criteria, to the World Heritage Committee (and, in the case of some cultural landscapes, advice to ICOMOS). It may also advise IUCN on other matters concerning World Heritage, including the State of Conservation of World Heritage properties and on policy matters relating to the Convention. Though it takes account of the policy context of IUCN's work under the Convention, its primary role is to deliver high quality scientific and technical advice to IUCN, which has the final responsibility for corporate recommendations made to the World Heritage Committee.

Membership: The members of the Panel comprise a) those IUCN staff with direct responsibility for IUCN's World Heritage work, and b) other IUCN staff, Commission members and external experts selected for their high level of experience with the *World Heritage Convention*. Thus the members are:

- The Head of the IUCN Programme on Protected Areas (Chair)
- Other staff of the Programme on Protected Areas
- The IUCN Special Advisor for World Heritage
- The IUCN Senior Advisor for World Heritage
- The WCPA Vice Chair for World Heritage
- The Head of the UNEP-WCMC Protected Areas Programme
- Up to three other technical advisors, whose World Heritage expertise is recognized at a global level. In 2009 this included regional representatives from Africa, Asia and the Pacific, with specialist areas of expertise in relation to earth science, species conservation and protected areas.

The Panel's preparations and its meetings are facilitated through the work of the World Heritage Officer (who serves as the Executive Officer for the Panel).

The Panel may also be attended by other IUCN staff (particularly from other Global Programmes with expertise in the subject matter of particular nominations), Commission members (including the Chair of WCPA) and external experts, upon invitation, for specific items as necessary. The Deputy Director General of IUCN attends the opening and closing session of the Panel for a full briefing on the process and recommendations, and the Director General of IUCN is fully briefed on the conclusions of the Panel.

4. EVALUATION REPORTS

Each technical evaluation report presents a concise summary of the nominated property, a comparison with other similar properties, 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 Committee. IUCN also submits separately to the World Heritage Centre its recommendation in the form of a draft decision, and a draft Statement of Outstanding Universal Value for all properties it recommends for inscription. Standardised data sheets, prepared for each natural or mixed nomination by UNEP-WCMC and/or IUCN, are available separately on request. In addition, IUCN carries out field missions and/or external reviews for cultural landscapes containing important natural values, and provides its comments to ICOMOS. This report contains a short summary of these comments on each cultural landscape nomination reviewed.

5. NOMINATIONS EXAMINED IN 2008 / 2009

11 nomination dossiers and 2 minor boundary modifications were examined by IUCN in the 2008

/ 2009 cycle, involving 9 field missions. These comprised:

- 6 natural property nominations (including 4 new nominations, 1 deferred nomination and 1 extension),
- 3 mixed property nominations (3 new nominations), where joint missions were undertaken with ICOMOS, and
- 2 cultural landscape nominations (2 new nominations).

One natural property (Pitons, cirques et remparts de l'Île de la Réunion, France) was examined by IUCN but has been postponed, at the request of the State Party of France, for consideration to the 34th Session of the Committee due to the application of the thresholds for numbers of nominations set out in the *Operational Guidelines*. Thus this nomination is not presented in the present report.

6. COLLABORATION WITH INTERNATIONAL EARTH SCIENCE UNIONS

IUCN implements its consideration of earth science values within the *World Heritage Convention* through a global theme study on Geological Heritage published in 2005. It concluded collaboration agreements with the International Union of Geological Sciences (IUGS) and the International Association of Geomorphologists (IAG) in 2006. These agreements are focused on strengthening the evaluation process by providing access to the global networks of earth scientists coordinated through IUGS and IAG. As a result, over 30 of the approximately 130 external reviews in 2008 came from IUGS and IAG experts.

It is also anticipated that the collaboration agreements will lead to increased support to States Parties more generally through the preparation of targeted theme studies that provide further guidance on earth science sites. A theme study on caves and karst was completed in 2008 and studies on deserts and volcanoes are in preparation and should be presented to the 33rd Session of the Committee.

IUCN would like to record its gratitude to IUGS and IAG for their willingness to provide support for its advisory role to the *World Heritage Convention,* and will continue to inform the World Heritage Committee on the implementation of the collaboration agreements with IUGS and IAG.

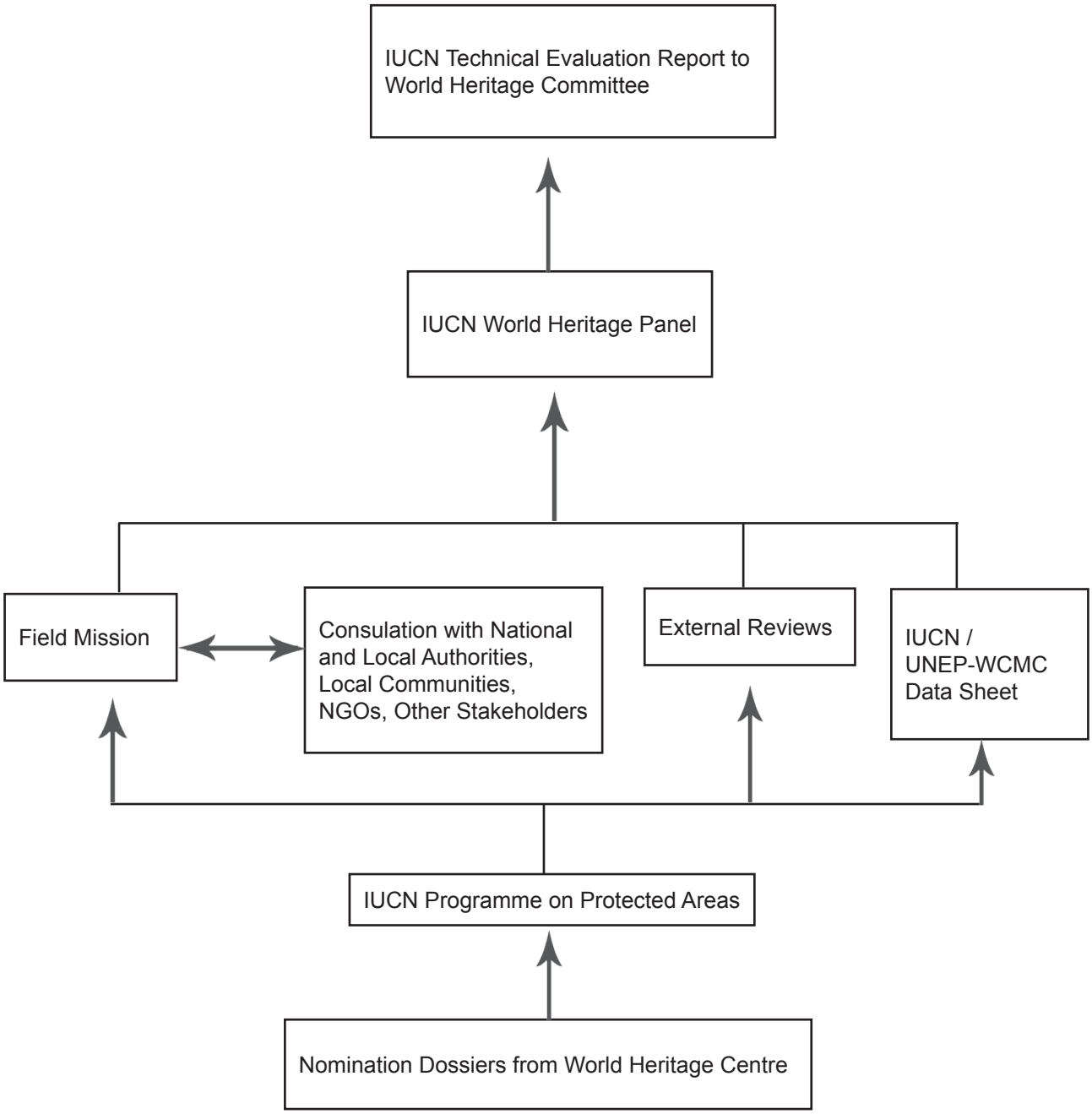
7. RECOMMENDATIONS TO THE WORLD HERITAGE COMMITTEE

In the 2008 / 2009 cycle, IUCN has sought to ensure that States Parties have the opportunity to provide all the necessary information on their nominated properties through the process outlined in section 2 above. As per Decision 30 COM 13 of the World Heritage Committee (Vilnius, 2006), IUCN has not taken into consideration or included any information submitted by States Parties after 28 February 2008, as evidenced by the postmark. IUCN has previously noted a number of points for improvement in the evaluation process, and especially to clarify the timelines involved.

8. ACKNOWLEDGEMENTS

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, many of them from IUCN's Commissions and Networks, and numerous IUCN staff at Headquarters and in IUCN's Regional and Country Offices. Many others contributed inputs during field missions. This support is acknowledged with deep gratitude.

Figure 1: IUCN Evaluation Process



A1 New Nominations of Natural Properties

Asia / Pacific

Korean Cretaceous Dinosaur Coast

Republic of Korea

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

KOREAN CRETACEOUS DINOSAUR COAST (REPUBLIC OF KOREA) ID No. 1320

1. DOCUMENTATION

i) Date nomination received by IUCN: 15th March 2008.

ii) Additional information officially requested from and provided by the State Party: No additional information was requested from or provided by the State Party.

iii) IUCN/WCMC Data Sheet: Sourced from nomination document which cites 110 references.

iv) Additional Literature Consulted: Lockley, M. and Meyer, C. (2000) **Dinosaur Tracks and Other Fossil Footprints in Europe.** Columbia University Press, New York, 323pp; Lockley, M. (1991) **Tracking Dinosaurs.** Cambridge University Press, 252pp; Lockley, M. and Hunt, A. (1995) **Dinosaur Tracks and Other Fossil Footprints of the Western United States.** Columbia University Press, 336pp.; Gillette, D. and Lockley. M. (1989) **Dinosaur Tracks and Traces.** Cambridge University Press, 480pp.; Dingwall, P., Weighell T. & Badman, T. (2005) **Geological World Heritage: A Global Framework.** IUCN / WCPA; Wells R. (1996) **Earth's Geological History: A contextual framework for assessment of World Heritage fossil site nominations.** IUCN, 43pp. A range of additional sources of published material on dinosaur trackways and ichnites was also consulted, including past and current World Heritage nominations related to fossil sites.

v) Consultations: 9 external reviews. The mission met with a large cross section of stakeholders in the nominated property, as well as scientific advisers and representatives of the State Party, and of regional and municipal government.

vi) Field Visit: Patrick McKeever, October 2008.

vii) Date of IUCN approval of this report: 17th April 2009.

2. SUMMARY OF NATURAL VALUES

The Korean Cretaceous Dinosaur Coast (KCDC) is nominated as a serial property comprising five component parts, which are located along some 160km of the southern coast of the Korean peninsula and its hinterland. Four components have been exposed by natural processes of coastal erosion. The coast is subject to late summer typhoons that bring strong winds and heavy rainfall. From west to east the coastal components are found at Haenam, Boseong, Yeosu and Goseong. One component, Hwasun, is exposed on the floor of a disused quarry c. 40km inland approximately NNW of Boseong. The total area of the nominated property is 1099.2ha.

The values of the property that are the basis for the nomination relate to the fossilised traces of dinosaurs, and the environments in which they lived. The sites of the KCDC provide palaeontological evidence in the form of dinosaur trackways, and also through the presence of bird and pterosaur tracks, dinosaur eggs (at Boseong), some dinosaur bone remains, and through the presence of invertebrate traces and some fossil plant remains.

The nominated serial property lies on the geographical and geological margins of East Asia today, just as it did during the Cretaceous period. The dinosaur fossils are preserved within a sequence of non-marine sedimentary strata. Unlike body fossils that are the static remains of dead animals, trace fossils, such as the footprints exposed in the KCDC sites, are sedimentary structures that were made by living animals. Thus they provide information on how animals lived and behaved in the fossil past, presenting a complementary record to the direct remains of prehistoric animals in the form of fossil skeletons.

Taken as a whole the component parts of the KCDC include trackways and eggsites spanning the period between 110 million years ago (Goseong) up to 65 million years ago (Yeosu). The key features of the five component parts are noted as follows:

- Haenam: A total of 823 dinosaur tracks (ornithopods, sauropods and theropods), 443 pterosaur tracks and numerous bird tracks showing evidence of webbed feet, together with microfossils and fossil wood are found in

this component. The pterosaur (flying reptile) trackways show indisputable evidence that large pterosaurs were quadrupedal and well adapted to walking on land.

- Hwasun: 1,800 dinosaur tracks, including 73 trackways showing sequences of footprints. A high concentration of theropod trackways as well as two types of orthnithopod and a large sauropod trackway. Numerous layers of strata display dinosaur trackways. One layer displays a sauropod and six theropod trackways, one of which shows an accelerating gait from a speed of 13km per hour accelerating to 19km per hour. Numerous ornithopod trackways are found here also, including some moving in a parallel direction.
- Boseong: Over 200 dinosaur eggs have been found from seventeen egg clutches and a few isolated individual eggs. Numerous eggshell fragments are also recorded here. Eggs found *in situ* occur in at least six separate horizons. A main point of interest here is that the section includes some 10m of strata with successive egg-bearing layers indicating that this was a consistent egg-laying site for dinosaurs over a prolonged period of time. Mostly the eggs are top-broken indicating that the eggs had hatched before being buried in sediment.
- Yeosu: The dinosaur trackways from Yeosu include 85 ornithopod trackways, 29 theropod and 1 sauropod trackway. There are an estimated 4,000 individual dinosaur footprints. The ornithopod trackways are dominant and also show a preferred northwest-southeast direction of movement (parallel to the palaeo-shoreline). At Nang island (Nang-Do) a theropod track can be seen turning in its direction of travel. At Sa island (Sa-Do) trackways of ornithopods, sauropods, theropods and birds are all preserved and while the theropod tracks appear random in direction, the ornithopod trackways show a preferred direction of movement. Bird tracks are also present.
- Goseong: trackways have been recorded at more than 320 stratigraphical levels, which is claimed as the highest concentration of track-bearing levels known. This component includes 249 ornithopod trackways, 139 sauropod trackways and 24 theropod trackways. There are an estimated 5,000 individual dinosaur footprints. The trackways are dominated by those of medium-sized ornithopods. The ornithopod tracks show the same preferred orientation on layer after layer, possibly indicating a preferred migration direction over an extended period of time. Bird tracks here are often associated with invertebrate ichnites, possibly made by the animals on which the birds were feeding. The abundance of bird tracks here suggests that shorebird communities were well established by the Lower Cretaceous, some 30 million years earlier than that inferred from skeletal remains.

Although the sites have been thoroughly investigated, scientific research is still ongoing and new discoveries are made. These investigations have helped to build up a picture of the lifestyle of the three main groups of dinosaurs as well as helping to understand the locomotory ability of large pterosaurs.

3. COMPARISONS WITH OTHER AREAS

IUCN notes that this is the third nomination for a property based on dinosaur footprints and traces to be put forward for consideration in the last three sessions of the World Heritage Committee. In 2006 the Committee decided to defer the nomination of the Dinosaur Ichnites of the Iberian Peninsula (IDPI) (Spain) as a serial property with a series of recommendations for further consideration. A revised joint nomination for a transnational serial property with the same title (IDPI) was resubmitted by Spain and Portugal in 2008 but was not complete and therefore was not evaluated. A resubmission of this nomination was accepted as complete in March 2009 and has therefore recently entered the evaluation process for consideration at the 34th Session of the Committee in 2010. IUCN is not in a position to comment on the merits of this proposal while it is still at the early stages of evaluation, however it can already be noted that the comparative methodology within it is different to that in the present nomination from Korea and reaches different conclusions.

In 2008 a nomination of Cal Orck'O (Bolivia) was withdrawn by the State Party. IUCN's recommendation was not to inscribe this property due to its values being too narrow to justify a claim for Outstanding Universal Value, and because of integrity concerns. The comparative analysis in that nomination also reached different results to that presented in the nomination of the KCDC.

A key principle set by the World Heritage Committee in its previous consideration of the nomination of the IDPI (Decision 30.COM 8B.26) was to note the importance of a thorough, global comparative analysis, including a clear justification for a property based on dinosaur ichnites to be considered as being of outstanding universal value.

IUCN in its past evaluations has noted the significant challenges in relation to comparative analysis for properties nominated solely for their dinosaur footprint values. The most obvious of these is the fact that the so-called "Age of the Dinosaurs" is already represented by a number of existing World Heritage properties inscribed for their fossil values.

Three of these sites record dinosaur trackways though none of these were inscribed on the basis of trackways alone. Ischigualasto-Talampaya Natural Parks (Argentina) was inscribed because it contains a complete sequence of fossiliferous continental sediments representing the entire Triassic Period (45 million years) of geological history. The nominated property includes evidence of the earliest dinosaurs as they made their transition from the archosaurs. Moreover it also records the contemporaneous evolution of mammals. Dinosaur Provincial Park (Canada) has yielded over 150 complete dinosaur skeletons as well as additional disorganised concentrations of bones dating from 75 million years ago in the late Cretaceous. The Dorset and East Devon Coast (UK) records rocks from the Mesozoic and includes one of the most outstanding marine sequences of Jurassic strata from anywhere in the world. However, terrestrial sediments are rarer and dinosaur trackways here are limited to a short period of time at the Jurassic – Cretaceous boundary. Other fossil-related properties already inscribed on the World Heritage List are less directly comparable with the KCDC nomination.

In relation to broader comparisons, it can be noted that whilst scientific records of dinosaur trackways date back over 200 years, the study of dinosaur ichnology has only recently become a significant discipline within geological sciences relatively. Over the last three decades the number of recorded sites of dinosaur trackways across the world has multiplied, and new sites continue to be discovered: thus, conducting a comparative analysis is challenging given the high potential for new discoveries. Amongst notable fossil footprint sites, the Lark Quarry site in Australia includes 3000 prints and is considered to record a stampede of small dinosaurs some 95 million years ago. Sites across Colorado, Texas, New Mexico and Utah in the USA record many other types of dinosaur behaviour including herding.

The State Party presents a comparative analysis of c.20 pages within the nomination. This has not been carried out with the degree of depth of comparative study for Miguasha (Canada) which is regarded as the benchmark for such studies for fossil sites, nor the separate comparative analysis carried out for the Joggins Fossil Cliffs (also Canada) which also set a standard in such studies. The most notable shortcoming in the comparative study of KCDC is the lack of a clear comparative framework of established criteria, within which a comparison is then carried out. The comparison does not attempt a comparison relative to fossil properties as a whole, but only in relation to properties of importance for dinosaur trace fossils. This presents, through a series of tables, qualitative and quantitative comparisons of the property with a number of other notable global sites. The four components with footprint values are compared in one set of tables whilst the egg site at Boseong is compared separately. The majority of the comparisons are therefore offered at “component level” rather than for the series as a whole, although there is some commentary on the latter aspect as well.

Viewed at the component level, the nomination presents several quantitative tables. Although quantitative values are not the sole measure of significance they provide one means of considering the relative merits of different sites. The table below summarises the conclusions of these tables in relation to the four footprint sites (Yeosu, Goseong, Haenam, Hwasun):

IUCN notes on the basis of this comparative table there is not a compelling picture of global value presented by the State Party’s comparative analysis. The nomination also presents a comparative scorecard at component level attempting to synthesize a number of different factors. This presents weighted scores for a series of properties and asserts the superiority of the four Korean components over all but Cal Orck’O. However IUCN considers this analysis flawed as the weighting adopted is arbitrary, the selection of criteria does not consider all parameters that could be relevant. It also includes several factors that relate to different aspects of site management, which IUCN notes are parameters that can vary rapidly according to the efforts placed on such work. There is no quantitative evaluation at the level of the series presented, although now the nomination of IDPI site is within the evaluation system this could be attempted.

A second set of comparisons is offered for the Boseong egg site. This presents a comparison with

Table 1: Ranking of components of the nominated property relative to other fossil footprint sites

	Size	Number of trackways	Number of dinosaur footprints
Yeosu	13th	7th	4th
Goseong	14th	2nd	2nd
Haenam	16th	12th	12th
Hwasun	19th	10th	7th

16 other eggsites. Whilst again there are questions regarding the parameters for selection and the weighting, IUCN notes that the most striking element of this comparison, as presented in the nomination, is that three parameters are selected to describe the fossil values of the different eggsites: whether the site was used for nesting, whether clutches of eggs are present and whether fossil embryos are present. Boseong is one of only four sites where dinosaur embryos are not present.

A comparison is attempted for the series as a whole. IUCN notes a number of statements as significant within this. Firstly, the text of the comparison states that : "in summary the present serial nomination covers the largest samples of dinosaur trackways, tracks and nesting sites in Asia". Although IUCN has not been able to fully substantiate this claim, it is in general supported by reviewers. IUCN notes that this strongly suggests a regional rather than a global level of significance, which, for fossil sites, is not at the level recognised in past inscriptions. IUCN has reproduced in Annex 1 the responses in the nomination to the fossil checklist that has been used consistently in advising the Committee for many years. Apart from the significant lack of broader comparisons with fossil sites as a whole described above, taken only on its own terms, IUCN notes a number of points in the conclusions from this analysis that clearly indicate that the basis of the case for Outstanding Universal Value in the nomination is weak:

a) In relation to uniqueness the response emphasises the importance of bird tracks. Whilst birds may be regarded as modern descendants of the dinosaurs, the value for bird tracks is not a compelling distinction to support a recognition of Outstanding Universal Value.

b) In relation to comparable sites, important in understanding the total "story" of this point in time, the comparison acknowledges the complementary nature of body fossils but makes no comparison with those sites, and also notes that "only the Iberian track record compares". This latter record is the subject of the new IDPI nomination.

c) In relation to the existence of other sites for major scientific advances, the comparison states that this is not the only site to contribute but states it is "unique among Cretaceous tracksites in contributing to this understanding at a regional scale." This again suggests that the values are constrained within tracksites, and to be compelling at a regional scale. This conclusion is supported by analysis of the external reviews of the nomination considered by IUCN.

In summary IUCN considers that whilst the comparative methodology adopted in the nomination has some questionable aspects, the balance of evidence provided by the nomination, IUCN's own comparative analysis and the input of independent reviewers suggests that the nominated property is of significance at the regional scale within Cretaceous tracksites, and that there are other comparable examples that are of at least equal value. The past decisions of the World Heritage Committee have established a very clear requirement for fossil World Heritage properties to demonstrate, in a compelling way, an unparalleled value at the global level. IUCN considers that the nomination has not demonstrated that the Korean Cretaceous Dinosaur Coast is of Outstanding Universal Value.

4. INTEGRITY

4.1. Protection

The proportion of each of the five components that is under public and private ownership varies, but typically exceeds 80% in each. There is also a commitment that 100% of the land of each component part will be in public ownership in the near future. Development is legally restricted in all parts of the nominated property. The components are strictly supervised as State-designated cultural heritage properties under the Cultural Heritage Protection Act and all of the component parts are designated as a Natural Monuments. Any proposed change or works, including constructing facilities within 500m of the boundary of a designated cultural property, is examined by a group of at least three experts to assess possible damage or impact. Should possible damage or impact be envisaged, permission to change the current state must be sought from the National Cultural Heritage Committee. Additionally, all the components are subject to the Cultural Heritage Protection Regulation, 1962 (revised 2007), the Enforcement Decree of the Cultural Heritage Protection Act and the Guidelines for the Preservation and Management of Fossil Sites (2007). Hwasun, Haenam, Boseong and Yeosu are under the protection of the Jeollanam-do Cultural Heritage Ordinance 1999 while Goseong is under the protection of the Gyeongsangnam-do Cultural Heritage Ordinance 1999.

IUCN considers the protection status of the nominated property meets the requirements set out in the *Operational Guidelines*.

4.2 Boundaries

The boundaries of the component parts of the nominated property and their buffer zones have all been clearly delineated and ownership has been thoroughly determined. The boundaries of the property are adequate to encompass the nominated values and the buffer zones, although relatively

limited, are sufficient to provide the necessary protection from external threats. Each buffer zone also includes the location of a visitor centre or museum related to the relevant cluster so they also perform an important role in managing visitation to the property.

IUCN considers that the boundaries of the nominated property meet the requirements set out in the *Operational Guidelines*.

4.3 Management

The nomination outlines in detail a management system and a management plan and function. The plan has been prepared to conserve and manage the property in line with the prescriptions of the UNESCO World Heritage Convention. The nomination indicates that the plan establishes an organisation that can consolidate and efficiently manage the nominated sites that are scattered across two provinces and five counties. The plan is stated as being a five-year plan to be implemented from 2008 – 2012.

The evaluation mission of IUCN noted that this management plan is not yet being implemented. While it is clear that each of the five components is well managed at the local level there is no single, over-arching management plan yet in place. Management bodies of all five components do co-operate, whether it be in terms of common branding or exchange of staff but the series is not yet managed as a whole or within a single management system.

IUCN considers that there is little doubt that the resources and capacity are in place to create an overall management system for the nominated property, if requested, however this aspect does not meet the expectations of the *Operational Guidelines* at the present time.

4.4 Threats

Environmental pressures

Atmospheric and biological agents play an important role on the conservation conditions of the components of the nominated property (sun, wind, differences of temperature, water, etc.). In the case of the Korean Cretaceous Dinosaur Coast nomination the main threats come from the mostly coastal locations of the areas nominated. With the exception of the Hwasun, the component parts are all coastal and many of the individual trackway-bearing horizons lie within the inter-tidal zone. As such they are subject to the processes of coastal erosion, and these are exacerbated as the region lies within the typhoon zone of East Asia.

One matter of concern is that the coastal components have not been subject to ongoing systematic monitoring in terms of damage or loss due to erosion. Whilst erosion could lead to exposure of new prints, without monitoring it is not possible to determine whether over time the values would increase, decrease or remain stable. At Hwasun, the quarry face has been subject to protection measures aimed at limiting run-off across the main rock face after rain and this seems to be effective. At Haenam, most of the trackways have been built over, *in situ*, to create museum buildings. At one of these buildings, poor air circulation was observed to be leading to a build up of algae and moss on the dinosaur trackway bearing layer. While this has not yet damaged the actual trackways themselves, if left unchecked the trackways could become damaged and/or obscured.

IUCN recommends that a systematic monitoring of natural processes at all sites be put in place with particular emphasis on the coastal sites and that a plan of preventive action is enacted at Haenam.

Human use

Human use of the property appears to be well managed and no issues were identified at any of the components during the evaluation mission. All are accessible and open to the public but the trackway bearing layers are either fenced off, as at Boseong and Goseong, or housed in protective buildings such as at Haenam. Tourism and visitation is well catered for at each of the components whether in terms of protective walkways that take the visitor to the trackway layers without the need for them to actually walk on them or whether in terms of visitor centres and/or museums. A code of ethics for visitors has been drawn up and appears to be well thought through. Monitoring plans in relation to visitation are in place.

IUCN concludes that at the present time the conditions of integrity and requirements for protection and management are not fully met, in relation to the lack of an overall management system for the nominated property. The degree to which the values of the nominated property might be lost or enhanced over time due to coastal erosion can not be determined at the present time due to the lack of available monitoring and the lack of relevant systems. It is likely that both of these matters could be addressed if requested following a sufficient period to consider them.

5. ADDITIONAL COMMENTS

5.1 Justification for Serial Approach

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

a) What is the justification for the serial approach?

In principle, a serial approach is justified in uniting related components that convey complementary information related to the fossil values of dinosaurs.

b) Are the separate component parts of the nominated property functionally linked in relation to the requirements of the *Operational Guidelines*?

The different components selected are geologically linked in relation to key factors including the stratigraphic column and sedimentological history, the geological period concerned, the evidence of dinosaurs. They also have consistent research activity and also have a functional linkage in providing a cohesive group of facilities to visitors to enable the understanding of the values of the series as a whole.

c) Is there an effective overall management framework for all the component parts of the nominated property?

As noted above this is likely to be put in place and is achievable, however it is not in place at the present time.

5.2 Transnational cooperation

Although it is not possible or appropriate to consider the nomination of the IDPI recently submitted by Spain and Portugal, IUCN notes that the nomination of KCDC makes direct reference to the concept of the "Global Network for Dinosaur Trackways" and the banner of "Dinosaurs Walking in a Drifting World". The latter is noted at the front of the nomination, and is stated to unite the withdrawn Bolivian nomination of Cal Orck'O, the IDPI and the KCDC. No further details are provided in the nomination of the KCDC, and there is no suggestion that this represents more than a banner. IUCN notes that as two different nominations have been submitted it is bound to regard these as separate proposals and there is no framework within the *World Heritage Convention* to submit linked nominations except via the means of a transnational serial nomination. The prospect of a single transnational management system for properties in Western Europe, South America and Korea appears highly unlikely to be practical and achievable. IUCN would also note that such an open-ended concept would create the potential for an unlimited series of dinosaur tracksites that would lead to an unworkable situation in relation to the operation of the World Heritage List.

6. APPLICATION OF CRITERIA

The Korean Cretaceous Dinosaur Coast has been nominated under natural criterion viii.

Criterion (viii): Earth's history and geological features

The five component parts of the KCDC, taken together, present important evidence of dinosaur behaviour and this is one of a number of significant localities for the study of dinosaur footprints. The nominated property is assessed as possibly the most significant concentration of evidence of dinosaur trace fossils in Asia. This level of regional significance is notable, however is not at the level that has been recognised by the Committee as being of Outstanding Universal Value in relation to inscriptions of fossil sites. Taken individually, the components of the property appear to rank amongst the top 25 known dinosaur footprint sites, and Goseong is amongst the highest ranking in relation to its concentration of track bearing levels. However, there is no compelling evidence that the five components are the highest ranking series globally for tracksites, nor has a convincing comparison been made within a framework that encompasses all fossil sites. The eggsite at Boseong appears to be secondary to a significant number of eggsites known which show the evidence of dinosaur embryos, which are not seen at Boseong. Management and protection of the individual components of the property, including provision for visitors is being delivered to a high standard within each component of the property, but there is currently a lack of an operational overall management system. A lack of sufficient monitoring data to determine the long term future of the values of the property in relation to coastal erosion and other natural deterioration are concerns in relation to integrity. IUCN considers that the nominated property does not meet this criterion.

7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopt the following decision:

The World Heritage Committee,

1. Having examined Documents **WHC-09/33.COM/8B** and **WHC-09/33.COM/INF 8B2**.

2. Decides not to inscribe the **Korean Cretaceous Dinosaur Coast, Republic of Korea,** on the World Heritage List on the basis of natural criteria;

3. Commends the State Party for its investment in the conservation of the dinosaur footprints and other trace fossils within the nominated property, and for the quality of its work on the creation of visitor facilities and support for research activities;

4. Recommends the State Party to continue its efforts to conserve and present the components of the nominated property through other forms of national and regional systems of recognition for important geological features.

ANNEX: IUCN Checklist for the Evaluation of nominated Fossil properties

1. Does the nominated property provide fossils which cover an extended period of geological time (i.e. how wide is the geological window)?

Individually the different components do not present evidence over a significant time period, although the Goseong component with over 320 footprint bearing horizons has a stronger claim in this regard. Taken together the components of the serial property do cover a reasonable window of the Cretaceous period, although only one of the properties is of Lower Cretaceous age.

2. Does the nominated property provide specimens of a limited number of species or whole biotic assemblages (i.e. how rich is the site in species diversity)?

Yeosu is assessed as having moderate diversity, Haenam, Hwasun are assessed as having moderate-high diversity and Goseong as having moderate-very high diversity. Boseong has diverse egg assemblages but is secondary to other egg sites in the breadth of its natural values. Taken together the diversity appears broadly comparable to a number of other fossil footprint sites worldwide, but is not exceptional. The bird footprints may be the most diverse known. Limited comparative analysis is available to support this conclusion.

3. How unique is the nominated property in yielding fossil specimens for that particular period of geological time (i.e. would this be <u>the</u> type locality for study or are there other similar areas that are alternatives)?

The level of "uniqueness" does not appear to be greater than that of a number of other footprint localities. It appears likely that the fossil remains of the property are less unique and less spectacular than the most significant concentrations of dinosaur body fossils, however a thorough comparative analysis on this point has not been undertaken. The presence of bird fossils is a main distinctive basis for the uniqueness of the property, together with the record of multiple trackway levels at Goseong.

4. Are there comparable sites elsewhere that contribute to the understanding of the total "story" of that point in time/space (i.e. is a single property nomination sufficient or should a serial nomination be considered)?

Sites with rich records of body fossils are comparable and provide information that is not possible to determine from trace fossils. There are also a number of comparable properties for their dinosaur footprints, notably the nominated property from Spain and Portugal which is mentioned in the nomination, as well as a number of other properties globally. The property has a strength in the relative proximity and commonality of its different components, although this is a secondary consideration in relation to the identification of comparable areas.

5. Is the site the only or main location where major scientific advances were (or are being) made that have made a substantial contribution to the understanding of life on earth?

The property is not the only or main location for major scientific advances. The contribution of some components is not assessed in the nomination, whilst the contribution of Goseong appears higher than the other four localities. The property appears to be one of a number of sites where advances have been made, and is especially important in the regional context.

6. What are the prospects for on-going discoveries at the nominated property?

The prospects are moderate but assuming continued research effort is a certainty that there will be further discoveries. Future discoveries are more likely in relation to the tracks of birds and small dinosaurs, and mostly outside the nominated areas but in the buffer zones.

7. How international is the level of interest in the nominated property?

The prospects of further discoveries appear to be relatively high, but the nomination notes that the level of international research measured in relation to the number of nationalities of publishing scientists is not high for most of the components.

8. Are there other features of natural values (e.g. scenery, landform, vegetation) associated with the nominated property (i.e. does there exist in the adjacent area modern geological or biological processes that relate to the fossil resource)?

Four of the components are located in coastal landscapes that appear to be of local-national significance in relation to their scenic values.

9. What is the state of preservation of specimens yielded from the nominated property?

The quality of preservation in relation to the normal condition of fossil footprints is in general of a good standard. There is a concern regarding the long term trends in the values within the coastal properties as the impacts of coastal erosion have not been assessed.

10. Do the fossils yielded provide an understanding of the conservation status of contemporary taxa and/or communities (i.e. how relevant is the nominated property in documenting the consequences to modern biota of gradual change through time)?

The fossils of the nominated property have limited relevance in relation to this question, due to their age.

Map 1: General location of nominated property

Figure1.1. Location of the Republic of Korea.

Figure1.2. The Republic of Korea showing the location of the nominated property.

Europe / North America

The Wadden Sea

Germany / The Netherlands

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

THE WADDEN SEA (GERMANY/THE NETHERLANDS) ID No 1314

Background note: In 1988 Germany nominated the Wadden Sea as a national nomination focussed mainly on the mudflats of Lower Saxony. The Committee at its 13th Session (Paris, 1989), recommended that the nomination of this property be deferred until a fully revised nomination of the Wadden Sea was submitted jointly by Denmark, Germany and the Netherlands.

1. DOCUMENTATION

i) Date nomination received by IUCN: 15 March 2008.

ii) Additional information officially requested from and provided by the State Party: Additional information regarding the nomination was requested following the IUCN field visit. The State Parties of Germany and The Netherlands submitted in November 2008 additional information on the nomination including further work on its global comparative study. Further additional information was requested from the State Parties following the IUCN World Heritage Panel, and was provided to the World Heritage Centre and IUCN in February 2009.

iii) IUCN/WCMC Data Sheet: Sourced from nomination document which cites 28 references.

iv) Additional Literature Consulted: Dijkema, K.S. (Ed.) (1984) **Salt marshes in Europe**. Council of Europe. Nature and Environment Series 30, Strasbourg, pp. 178; Thorsell, J., Ferster Levy, R. and Sigaty, T. (1997) **A global overview of wetland and marine protected areas on the World Heritage List**. IUCN, Gland, Switzerland, 23 pp; Buttler, R.W., Davidson, C.N. and Guy-Morrison, R.I. (2001) **Global-scale Shorebird Distribution in Relation to Productivity of Near-shore Ocean Waters**. In Waterbirds Vol. 24, No. 2, pp 224-232; Beukema, J.J. (2002) **Expected changes in the benthic fauna of Wadden Sea tidal flats as a result of sea level rise or bottom subsidence**. Journal of Sea No. 47: 25-39; De Jong, F. (2003) **Wadden Sea Targets: lessons from the first six years**. In Wolff WJ, Essink K, Kellermann A, Van Leeuw MA (Eds.), pp. 207-220; **Challenges to the Wadden Sea Area**. Proceedings of the 10th International Scientific Wadden Sea Symposium. Ministry of Agriculture Nature Management and Fisheries, Department of Marine Biology, University of Groningen, Netherlands; Blew, J., Günther K., Laursen, K., van Roomen, M., Südbeck, P., Eskildsen, K., Potel, P. and Rösner, H.U. (eds.), (2005) **Overview of Numbers and Trends of Migratory Waterbirds in the Wadden Sea 1980-2000**. Wadden Sea Ecosystem No. 20, Common Wadden Sea Secretariat, Trilateral Monitoring and Assessment Group, Joint Monitoring Group of Migratory Birds in the Wadden Sea, Wilhelmshaven, Germany, 51pp; De Vlas, J. and Marquenie, J. (2004) **The impact of subsidence and sea level rise in the Wadden Sea: Prediction and field verification**. Ameland's Commission on Environmental Monitoring, Assen, The Netherlands, 68 pp; Elphick, J. (edit) (2007) **The Atlas of Bird Migration**. The Natural History Museum, London, UK, 176pp. A wide range of additional references.

v) Consultations: 10 external reviews. The mission met with national representatives from both Germany and the Netherlands, representatives of: the Common Wadden Sea Secretariat, the Wadden Sea Forum and the Wadden Society, local politicians and officials; representatives of fisheries associations, key NGOs working in the area, site managers, experts and scientists working in a number of Research Centres and Scientific Institutions, and representatives of oil/gas companies.

vi) Field Visit: Pedro Rosabal, 1-11 September 2008.

vii) Date of IUCN approval of this report: 15 April 2009.

2. SUMMARY OF NATURAL VALUES

The Wadden Sea is nominated as a serial transnational property encompassing the Dutch Wadden Sea Conservation Area and the German Wadden Sea National Parks of Niedersachsen and Schleswig-Holstein. The nominated property does not include the Danish part of the Wadden Sea, as its designation as a national park has not yet been concluded. Taking account of the extensive preparations already undertaken, the increased public support for the nomination in both countries and the uncertainty of whether and when further consultations on the World Heritage nomination will be re-initiated in the Danish Wadden Sea region, Germany and the Netherlands decided to proceed with a Dutch-German nomination. This decision was made at the 10th Governmental Danish-German-Dutch Wadden Sea Conference (The Netherlands, November 2005). Denmark remains a partner within the trilateral Wadden Sea cooperation agreement and is a signatory to the Wadden Sea Management Plan.

The nominated property is delimited by a boundary set at 3 nautical miles offshore, with the exception of areas off the East Friesian islands and off the islands of Sylt and Amrum, where the boundaries are up to 12 nautical miles offshore. The nominated property comprises four components which together encompass over 66% of the whole Wadden Sea. The nominated property excludes urban areas, areas under oil and gas exploitation and major seaports, harbours and associated infrastructure. Table 1 below summarises the different components of the nominated serial property.

The Wadden Sea is an extremely large temperate coastal wetland system containing an extensive and coherent system of tidal flats and barriers. The system is a depositional coastline which displays large scale coastal processes, and is notable for having very limited inputs from riverine sources. The nominated property has low overall relief: with its deepest and highest parts all lying within 50 m below and 50m above sea level.

The habitats and ecosystems within the nominated property are the product of intricate interactions between physical and biological factors. There is a multitude of transitional habitats with tidal channels, sandy shoals, sea-grass meadows, mussel beds, sandbars, mudflats, salt marshes, estuaries, beaches and dunes. A key feature of the hydrology of the nominated property is a continuous long-shore current from southwest to northeast. This is supplied with Atlantic water passing southward along the east coast of the United Kingdom and eastward through the English Channel. The combined effect of coastal currents and tides facilitates enrichment and distribution of nutrients which is essential for maintaining the biodiversity of the area. The density and diversity of the tidal flat fauna in the Wadden Sea are very high. The average biomass present in the tidal flats is 10-20 times higher than in the offshore area. The benthic biomass production on tidal flats results from two sources: microbial and microalgal production on the sediment surface and phytoplankton import with the tides from offshore waters.

The terrestrial vegetation within the nominated property is predominantly related to salt marshes with the highest biodiversity found in sandy salt marshes and in the transition zone to dunes. Dune grasslands and scrub also occur. The marine vegetation is characterized by seagrasses that occur in mixed stands on the tidal flats.

Coastal wetlands are often not among the richest sites in relation to faunal diversity. However, this is not the case in the Wadden Sea, which has a high habitat diversity generated by the dynamic transitions between the land and the sea and a rich spectrum of resources that support biodiversity. In addition, the Wadden Sea is in a key location relative to migration routes.

The nominated property protects critical habitat for about 2,700 marine species in the intertidal and subtidal zones and at least 5,000 semi-terrestrial and terrestrial species, mostly the flora and fauna of salt marshes and dunes on the islands. There are 2,300 species of flora and at least 4,200 species of fauna.

Table 1: Component parts of the nominated property

Country	Name of component part	Size (ha)
The Netherlands	(1) PKB (Key Planning Area) I (IUCN Category IV Protected Area)	247,386
The Netherlands	(2) PKB Area II (IUCN Category IV Protected Area)	790
Germany	(3) National Park Niedersachsen (IUCN Category II)	283,519
Germany	(4) National Park Schleswig-Holstein (IUCN Category II)	436,698
TOTAL		**968,393**

Marine mammals present in the Wadden Sea include the harbour seal, grey seal, and harbour porpoise. After centuries of hunting, protection measures have resulted in recovery of the seal populations. The Wadden Sea now sustains approximately 20% of the North-east Atlantic subspecies of harbour seals: atotal of 15,426 were counted in an annual survey in 2006, compared to about 4,000 thirty years earlier.

The most renowned indicator of the values of the nominated property is its international importance as a breeding, staging, moulting and wintering area for birds. The availability of food and a low level of disturbance are essential factors that contribute to this ecological function. For 43 bird species the Wadden Sea supports more than 1% of the entire flyway population, which is the criterion used by the Ramsar Convention for identifying wetlands of international importance. Of these species, 4 visit for the breeding season, 24 are breeding as well as migratory species and 15 use the Wadden Sea only during their seasonal migrations. 29 species of migratory birds occur with more than 10% of their flyway population in the Wadden Sea. Regular censuses are carried out on breeding bird species that are considered characteristic for the Wadden Sea. The 2001 survey recorded a maximum of 469,000 breeding pairs or territories. Nearly 70% of the breeding bird population is represented by gulls, with Black-headed Gull, Lesser Black-backed Gull and Herring Gull being the most abundant species. Another 18% of the total breeding bird population are coastal waders, notably Oystercatcher.

For five species, at least 25% of north-western (NW) European populations breed in the Wadden Sea. For 21 out of 31 species, the population accounts for more than 1% of the NW-European population, the majority of which rely on the nominated property. Results from the different surveys suggest that over 6 million birds may be present in the Wadden Sea at the same time each year, and an average of 10-12 million birds pass through the property annually.

3. COMPARISONS WITH OTHER AREAS

The nomination dossier provides a detailed comparative analysis which was further enhanced by additional information provided by the State Parties of Germany and the Netherlands in November 2008 and February 2009.

In relation to its values for geomorphology, the nominated property is compared with 180 tidal flats areas worldwide. Whilst tidal flats can be found in all climate zones, the largest are found in the tropics. Rivers are major features strongly influencing their development via freshwater run-off and sediments in most cases. Examples are the tidal flats associated with rivers such as the Red River Delta, Huanghe, Yangtze Delta, Chao Phraya Delta, Mekong Delta, Gujarat, Nile Delta, Frobisher Bay and to a lesser extent the mangrove systems of Western Africa, Indochina, Myanmar coast, East Africa and New Guinea.

The Wadden Sea has developed in the temperate zone and it represents a tidal barrier island system that only has minor river influences fringing the flat and low-lying coastal plain. The nearest comparators are the temperate barrier and back-barrier environments of the Georgia Bight in USA. The Georgia Bight extends for a distance of 1200 km between Cape Hatteras in North Carolina to Cape Canaveral in Florida. Both the Wadden Sea and the Georgia Bight are mesotidal barrier coasts (areas with tidal range of 2-4 meters) and both have a coastal development affected by Holocene sea level rise. However Georgia Bight is not only smaller (800,000 ha) when compared to the Wadden Sea nominated property (968,393 ha) but, in particular, lacks extensive open tidal flats (300 km^2 vs. 4700 km^2 for the Wadden Sea), being instead characterized by extensive cord grass meadows with narrow intertidal flats along the margins of the tidal channels. Expert reviews received, from the International Union of Geological Sciences (IUGS) and the International Association of Geomorphologists (IAG), noted that the Wadden Sea is one of the most important and highly dynamic depositional marine and coastal geomorphological system on Earth.

In relation to its ecosystem values, the analysis compares the nominated property with 31 existing properties with significant marine components, 24 existing properties representing coastal island sites with no, or limited, marine components as well as with 180 tidal flats areas worldwide. Most of these areas are located in a different biogeographical region than that of the nominated property. Amongst existing World Heritage properties, The Sundarbans (Bangladesh and India), Everglades (USA) and Doñana (Spain) contain intertidal flats, but their extent is very limited when compared with the Wadden Sea. The closest comparator is Doñana National Park (Spain), however Doñana is located along the borders of the North-east Atlantic Ocean Region, whereas the Wadden Sea is located in the North Sea Region. Taken as a whole the two most appropriate sites for comparison are Banc d'Arguin (Mauritania) and Georgia Bight (USA). Comparisons are set out in table 2 on the following page and emphasise the extensive mudflat areas and the levels of biomass production as superlative aspects of the Wadden Sea. IUCN in its global overview of wetland and marine protected areas with potential for World Heritage listing (1997) considered the Wadden Sea as a key global area for maintaining biological processes; this opinion is confirmed by expert reviews received during the evaluation of this nominated property.

Table 2: Comparison of The Wadden Sea with Banc d'Arguin (Mauritania) and Georgia Bight (USA) (Ecosystem values)

Key Features	The Wadden Sea	Banc d' Arguin	Georgia Bight
Total Area (ha)	968,393	1,200,000	800,000
Area of Mudflats (ha)	450,000 (46%)	63,000 (5%)	30,000 (4%)
Climate Zone	Temperate	Dry subtropical with continental influence	Temperate
Key physiographic conditions	Complex tide-dominated barrier coast (not deltaic).	Relic of former deltas, back barrier islands with open mudflats.	Tide-dominated barrier coast (not deltaic).
Productivity (Primary production in gC/m²/y)	Phytoplankton: 200-300 Microphytes: 150 Seagrass: 500 Macrophytes: 500 – 1,000	Phytoplankton: 2.1-8.9	Phytoplankton: 200 Microphytes: 60 Seagrass: 150 - 500 Macrophytes: 800
Habitats and biotopes	Complex mosaic of bare intertidal flats fringed by saltmarshes, tidal channels, seagrass meadows and mussel beds.	Sand dunes, coastal swamps, small islands, intertidal areas with 80% seagrass cover.	Tidal channels with narrow band of bare intertidal flats. Most intertidal areas completed covered by saltmarshes.

Table 3: Comparison of the Wadden Sea nominated property with inscribed World Heritge properties with high biodiversity and/or waterfowl and migratory bird populations.

Name of Property	Size (ha)	Key Biodiversity Values	Biophysical Setting
The Wadden Sea (Germany and The Netherlands)	*968,393*	*900 species vascular plants; 176 birds (over 6.1 Million migratory birds at the same time; 10-12M each year)*	*Extensive and contiguous sand flats and mud flats*
Everglades National Park (U.S.A)	592,900	1,600 species vascular plants; 400 birds	Freshwater & coastal marshes, mangrove swamps
Fraser Island (Australia)	166,283	750 species vascular plants; 230 birds	Sandy Island
Doñana National Park (Spain)	54,252	750 vascular plants; 360 birds (500,000 waterfowl/ year)	Mediterranean Coastal marshlands and dunes
Sunderbans (Bangladesh and India)	272,510	334 species vascular plants (27 species of mangroves); 260 birds (200,000 - 300,000 migratory birds/ year)	Deltaic islands, waterways, intertidal area with extensive mangrove forest
Banc d'Arguin National Park (Mauritania)	1,200,000	200 species vascular plants; 108 birds, (2.1 million migratory birds/ year)	Mudflats, dunes, islands
iSimangaliso Wetland Park (South Africa)	239,566	2,173 species vascular plants; 521 birds	Coastal lakes, dunes and continental shelf

In relation to its biodiversity values, the nominated property is compared with both inscribed World Heritage properties and other protected areas worldwide that host a high biodiversity, both in general and in relation to birds. Key comparisons with a number of World Heritage properties are provided in Table 3 above.

The property most closely related to the Wadden Sea in this case is Banc d'Arguin (Mauritania), notable for hosting c.2.1 million overwintering birds within the East Atlantic Flyway. Georgia Bight (USA) hosts 1-2 million migratory birds in the West Atlantic Flyway. The Wadden Sea hosts over 6.1 million migratory birds at the same time and 10-12 million migratory birds in total each year. In addition recent global assessment of shorebird distribution in nearshore areas shows the Wadden Sea ranks as the most important area for migratory birds, in the context of the East Atlantic Flyway, and that it also plays a critical role for the Conservation of the African-Eurasian Migratory Waterbirds. In parallel to this key role for the survival of migratory birds species the Wadden Sea protects critical habitat for about 2,700 marine species in the intertidal and subtidal zones and at least 5,100 semi-terrestrial and terrestrial species, as well as wider importance for some regionally important populations of marine mammals, such as the harbour seal.

4. INTEGRITY

4.1 Protection

The nominated property is mainly classified as an IUCN Category VI protected area that includes other more restrictive categories of protected areas within its boundaries. All the existing protected areas are legally established by federal or state decrees. A small part of the nominated property (0.25%) is under private ownership. Management of private lands is regulated by existing protective measures.

An essential feature of the protection of the nominated property is that the framework of the Trilateral Wadden Sea Cooperation (The Netherlands, Germany and Denmark) provides it with one comprehensive protection and management scheme, with additional layers of protection at federal and state levels. This is also supported by a number of international legal instruments such as the Ramsar Convention, a Biosphere Reserve under the UNESCO's MaB Programme, a Particularly Sensitive Sea Area (PSSA) under the International Maritime Organization (IMO), Special Protection Area (SPAs) and a Special Area of Conservation (SACs) under the EU Birds and Habitats Directives. The nominated property is also protected under the African-Eurasian Waterbird Agreement (AEWA), which protects 235 waterbird species ecologically dependant on wetlands within the flyway.

IUCN considers the protection status of the nominated property meets the requirements set out in the *Operational Guidelines*.

4.2 Boundaries

The nominated property extends variously from the base of dikes constructed on the land to protect from flooding, from the spring high-tide water mark or from the brackish water limits of the Rivers Ems, Weser and Elb. It also includes inland Ramsar sites and sites included within the Natura 2000 Network. Offshore, the nominated property extends to three nautical miles from the island coastline to the North Sea, with the exception of areas off the East Friesian islands and off the islands of Sylt and Amrum, where the delimitation extends to 12 nautical miles offshore. The main islands or major parts of the islands that are subject to intensive use are not included within the nominated property. A number of adjoining areas under oil and gas exploitation and major seaports, harbours and associated infrastructure have also been excluded. Overall the boundaries are adequate to protect the existing values and ecological processes occurring within the nominated property.

As the whole Wadden Sea also includes areas in Denmark, IUCN requested supplementary information on whether the elements included in a nomination of Germany and the Netherlands can be considered of Outstanding Universal Value, without the Danish part of the system. In the reply provided, a comparative assessment of the importance of the Danish part of the Wadden Sea in relation to the nominated property was made and this is summarized in Table 4 below.

The comparison confirms that the substantial part of the most significant values of the Wadden Sea are encompassed within the nominated property. The large area of the property encompasses over 66% of the entire Wadden Sea ecosystems and is sufficient to maintain the critical ecological processes and to protect the key features and values. However the Danish Wadden Sea Area would undoubtedly enhance the integrity of the nominated property further.

IUCN considers that the boundaries of the nominated property meet the requirements set out in the *Operational Guidelines*, and that a further extension to include important areas of the Danish part of the Wadden Sea would strengthen the integrity of the nominated property further.

Table 4: Internal comparison within the Wadden Sea nominated property and the Danish Wadden Sea Area.

Key Features	Nominated Property	Danish Wadden Sea Area
Saltmarshes	28,000 ha	700 ha
Intertidal sand and mud flats	414,500 ha	4,500 ha
Subtidal flats and gullies	234,000 ha	24,500 ha
Offshore area (-15 m-depth seaward of the islands)	272, 000 ha	49,000 ha
Migratory birds (peak)	6.1 Million	c.450,000

4.3 Management

The key management authorities in the nominated property are the Federal Ministry for the Environment (Germany), the Nature Protection and Nuclear Safety Agency (Germany); the Federal Agency for Nature Conservation (Germany); and the Ministry of Agriculture, Nature and Food Quality (The Netherlands). The work of these institutions is supported and implemented through the different states by existing national parks administration. The involvement of Non Governmental Organisations (NGOs) in protected area management is substantial; they support not only operations through rangers and experts, but also most environmental education and awareness raising activities.

The entire nominated property is subject to active planning, management and monitoring, in national and international contexts, and with an exceptional level of integration and harmonized approach between the three countries involved in the management of the Wadden Sea. There are two key documents guiding the overall management: the "*Wadden Sea Plan*" which represents a legally binding planning and management framework for the whole area; and an Integrated Coastal Zone Management (ICZM) Strategy, prepared to address recommendations from the European Parliament on coastal zone conservation and management. There are specific management plans for the different protected areas within the nominated property.

The nominated property is well supported in terms of human and financial resources. Existing staff working directly in the protected areas within the property include 213 permanent positions covering technical experts, scientist and rangers. These permanent staff positions are complemented by over 200 staff funded by NGOs and local governments. Staff are highly qualified and subject of on-going training programmes to enhance their effectiveness. There is also effective law enforcement via local police, coastguards and naval police forces through an integrated system of patrolling and inspection. A navigation system used for commercial and recreational boasts in the Wadden Sea has geo-referenced information on the boundaries of all existing protected areas and the restrictions associated to each of them, thus helping to avoid negative impacts, and are augmented by targeted education programmes. Conservation efforts are also strongly supported by local governments and local NGOs provide significant volunteer support to management activities. Local communities are strongly committed to nature conservation through environmental education and nature based tourism activities. During the field mission, it was also possible to verify the exceptional level of public consultation implemented by the State Parties in preparing this nomination.

The overall level of funding dedicated by the State Parties of Germany and The Netherlands to the conservation and management of the property, is in the order of Euro 18.3 million, while the level of financial and in-kind support provided by NGOs and local institutions has been estimated in around Euro 4-5 million. The State of Niedersachsen in Germany established in 1994 a special fund, supported by oil and gas companies, which distributes c. Euro 1 million annually, to support scientific projects and activities to enhance the conservation status of the Wadden Sea. The Netherlands has also established a Wadden Fund, on the basis of income from gas production and from public funds, whose funding supports nature conservation and sustainable economic development. Overall management and conservation activities are well resourced.

IUCN requested the State Parties to clarify the role of the Wadden Sea Plan for ensuring the coordinated management of the nominated serial property as required under Paragraph 114 of the *Operational Guidelines*. The additional information provided by the State Parties noted that the Wadden Sea Plan was officially adopted in 1997 and is a legally binding document. The implementation of the plan is done by the standing bodies of the Trilateral Wadden Sea Cooperation through a Wadden Sea Board which oversees operational aspects of implementation and ensures effective coordination of the different tiers of management.

The Common Wadden Sea Secretariat (CWSS) is tasked with the daily implementation of the Wadden Sea Plan, coordination of the activities in the framework of the plan and a regular review of its implementation. Thus the Wadden Sea Plan was prepared and adopted long before the preparation of the present nomination of the property for inscription on the World Heritage List.

The State Parties provided a table of the activities that maintain the values of the nominated property in relation to the relevant natural criteria that have been established by the World Heritage Committee. They also noted that, at the last Governmental Wadden Sea Conference in 2005, it was agreed to further develop the Wadden Sea Plan to be adopted at the 2010 Governmental Wadden Sea Conference. This would include an update of policies and management measures that are further necessary to maintain the Outstanding Universal Value of the property in the event that the nominated property is inscribed on the World Heritage List.

IUCN considers the management of the nominated property meets the requirements set out in the *Operational Guidelines*.

4.4 Threats

The Wadden Sea lies within one of the most density populated areas of Europe, and thus the active management of a range of threats is required. The principal threats noted include the following:

4.4.1 Fisheries

The most important current fisheries within the nominated property are for blue mussel and shrimp. In the 1980s and 1990s, the environmental quality of the Wadden Sea decreased greatly, mainly because of the impact of mussel and cockle fishery, which had an impact not only on the biological processes as well as on the sediment dynamics and sediment composition. However, fisheries of these species have been strictly regulated and are subject to a comprehensive management scheme which is in line with the EU Water Framework Directive and the EU Habitats Directive. These regulatory measures are complemented by the establishment of a number of marine no-take protected areas and restoration measures. Zoning of fisheries is applied on a permanent or seasonal basis to regulate activities that could disturb birds and seals during critical periods of their lifecycle. Some activities are banned within the nominated property, such as mechanical cockle fishery and extraction of sand for commercial purposes. Whilst ecological monitoring shows positive trends there is an ongoing debate between industry, regulators and conservation organisations, who call for increased attention to fishery management, monitoring and research programmes on marine biodiversity.

4.4.2 Harbours, industrial facilities and maritime traffic

There are a number of important international ports located adjacent to the nominated property, which contribute significantly to the local and regional economy in terms of the supply and communications between mainland and the islands. A number of smaller ports are located directly adjacent to the nominated property on the mainland or on the islands. Access to the harbours and maintenance of navigation channels is subject to an integrated planning system including sediment management, both to maintain the shipping routes and to avoid environmental impacts to the marine and coastal ecosystems. A number of independent expert reviewers emphasised this system as being of the highest international standard.

Pollution resulting from harbours, seaports and urban areas, including nutrients and hazardous substances has been significantly reduced in the past 10 years through the application of strict regulations, control and monitoring systems. The pollution resulting from operational discharges from shipping has likewise been reduced under the designation of the North Sea, including the Wadden Sea, as a Special Sea Area under the International Convention for the Prevention of Pollution from Ships (MARPOL Convention). A rigorous system for control and monitoring of operational discharges has been developed and it is fully operational in both State Parties.

Shipping safety has been significantly enhanced during the last 10 years by the designation of traffic separation schemes in conjunction with the designation by the International Maritime Organization of the Wadden Sea as a Particularly Sensitive Sea Area (PSSA). The PSSA regime includes Vessel Traffic Management System (VTMS), Traffic Separation Scheme (TSS), navigation control and transboundary emergency management. Vessels carrying hazardous goods navigate the offshore routes in the North Sea far away from the coast and are thus separated from the other traffic according to the mandatory routing system adopted by the International Maritime Organization (IMO).

There is an excellent safety record and extensive contingency plans and transboundary cooperation are in place to deal with ship accidents. These plans are supported by adequate infrastructure (Contingency Planning Centres), state-of-the-art equipment, and well trained teams who carry out 20-30 training exercises per year for contingency interventions. Only double-hulled tankers are allowed to cross the area and in the last 10 years no major accidents have occurred. However, given the Wadden Sea is located adjacent to one of the world´s busiest shipping routes and that this region is characterized by changeable weather with adverse weather situations, shipping will continue to be a significant risk to the nominated property and the adjacent coastline for the foreseeable future.

4.4.3 Oil and Gas

There are oil and gas deposits in the Wadden Sea, a number of which are located outside the nominated property and have been under exploitation for the last 20 years. Exploration and exploitation of oil and gas requires authorisation under national and European legislation and the Wadden Sea Plan. Moreover, all international regulations for the protection of the sea and the coasts are also applied. Both the State Parties of The Netherlands and Germany have made a clear commitment at the highest political level to not allow exploration or exploitation of oil and gas within the boundaries of the nominated property.

In Germany oil exploitation adjacent to the nominated property is confined to the existing exploitation site at Mittelplate in the Schleswig-Holstein Wadden Sea. Throughout the full operation period of the Mittelplate platform, an independent research and monitoring program has been conducted in order to assess the ecological impact of the oil exploitation. Until now, no negative effects have been found in an extensive area surrounding the platform.

In the Dutch Wadden Sea, new exploration and exploitation of gas is only permitted from sites on land and from existing platforms in the North Sea coastal zone, outside the nominated property, and in accordance with the Wadden Sea Plan. The main impact, resulting from the exploitation of gas resources adjacent to the Dutch part of the nominated property is subsidence of the sea bed. The potential impact due to subsidence has been monitored by an Independent Scientific Panel since 1963 when the production commenced. No significant losses of natural values have been found and subsidence of tidal flats was fully compensated by natural sedimentation. Salt marshes are still increasing in height due to sedimentation.

Considering the importance of The Wadden Sea for migratory species all existing platforms and other facilities for oil and gas exploitation have adopted a new lighting system that minimizes any potential impacts to migratory birds.

4.4.4 Visitor and tourism pressures
Tourism and recreational activities are a substantial part of the public use and regional economic development in the nominated property. Approximately 20 million tourists stay overnight and 30-40 million day trippers visit the Wadden Sea region, mainly on the islands and the coastal areas on mainland. While most activity takes place outside the nominated property, all activities are intimately linked to the its values. Tourism activities are mainly associated with land-based tourism and recreation, tidal flat walking and recreational boating.

The potential for tourism growth is high. During the IUCN field mission it was evident that local communities are committed to maintain nature-based quality tourism instead of intensive massive tourism development. However it was also noted, during the mission and by a number of external reviewers, that the eventual inscription of nominated property in the World Heritage List could lead to the intensification of tourism, which could potentially generate negative environmental impacts. Whilst the Wadden Sea Plan has provisions on tourism development it is necessary to develop a Tourism and Visitation Strategy that will be able to maintain and enhance the natural values and integrity of the nominated property.

4.4.5 Wind Energy
Though the construction of new wind turbines is not allowed within the nominated property, it can be expected that cables from planned wind farms in the North Sea will need to cross the nominated property. Results from similar projects requiring submarine cables that were developed in the past shows that such interventions will mainly cause only a temporary impact on the bottom of the Wadden Sea. The construction of such cables is also subject to assessment and permission and, according to the Wadden Sea Plan, should be kept to the minimum number required and subject of full prior Environmental Impact Assessment to ensure no significant impacts result from such projects.

4.4.6 Natural disasters and risk preparedness
The nominated property has been affected by severe storm events in the past, which have altered the landscape and led to significant loss of life. These experiences have led to the development of an Integrated Coastal Defence and Protection Plan to protect inhabitants inside and outside the Wadden Sea. Local communities and specialized agencies are well trained and equipped to ensure the rapid implementation of this plan which has been effectively applied in a number of severe meteorological and hydrological events.

4.4.7 Climate Change
The nomination considers that the Wadden Sea will be able to adapt to a sea level rise as a result of climate change. Research and modelling applied on climate change predictions in the Wadden Sea shows that a moderate sea level rise (25 cm per 50 years) will be compensated by the import of sediment, derived from the tidal channels, shore-face and the beaches and dunes of the barrier islands. In addition to these hydrodynamical and morphological processes, biotic and ecological processes also positively contribute to sedimentation. In this respect, the importance of conserving seagrass, mussel beds and salt marshes due to their positive influence in deposition and reduction of coastal erosion has been carefully considered in adaptation and mitigation strategies. Results from research and modelling, including possible negative trends linked to the destruction and reconversion of wetlands along the East Atlantic Flyway and the Africa-Eurasian Flyway, also show that the importance of the Wadden Sea for the survival of migratory birds will increase in the years to come.

4.4.8 Invasive Alien Species
There is potential for the introduction of Invasive Alien Species through the discharge of ballast water and from aquaculture. Controls are in place to minimise the introduction of exotic species, to monitor their effect, and to adjust quality standards and management activities in order to conserve native species and natural ecosystems. No species can be introduced into the nominated property without an environmental assessment according to the EU Habitats Directive. Of some 52 known introduced species in the nominated property, only six are considered to have a strong impact on the composition of the existing biota in the Wadden Sea. There is a research and control system in place to mitigate the effects of introduced species to the native biota of the Wadden Sea.

In conclusion, IUCN considers that the nominated

property meets the conditions of integrity. IUCN notes that the State Parties of Germany and The Netherlands have excellent institutional, financial and technical capacity to cope with existing and future conservation challenges as to maintain the values and integrity of the nominated property.

5. ADDITIONAL COMMENTS

5.1 Justification for Serial Approach

When IUCN evaluates a serial nomination the following questions are addressed:

a) What is the justification for the serial approach?

The Wadden Sea is an extensive marine ecosystem and as such a nomination aiming to fulfil the requirements for achieving effective marine biodiversity conservation needs to use a broader landscape approach. The nominated property therefore fulfils this requirement by using a transnational serial approach. Its four components represent over 66% of the whole Wadden Sea, thus including areas that represent key natural values of the marine ecosystems and that are essential for the survival of migratory species.

b) Are the separate component parts of the nominated property functionally linked in relation to the requirements of the *Operational Guidelines*?

The four components nominated in this transnational serial property form an integral part of the whole Wadden Sea region, and are ecologically and functionally linked by the terrestrial and oceanographic processes occurring in the Wadden Sea.

c) Is there an effective overall management framework for all the component parts of the nominated property?

As noted under section 4.3, the Wadden Sea Plan is the coordinated management plan for the Wadden Sea as it provides specific guidance on how to integrate and harmonize the individual management plans for the different components of this serial nomination.

5.2 Cultural Values

ICOMOS noted to IUCN that in addition to its natural values “The Wadden Sea is acknowledged as an important cultural landscape which has been well-researched.” The area that has been studied is much larger than the present nomination. Experts consulted during the field mission as well as independent reviewers concluded that, whilst there are important cultural values associated with the nominated property, the most significant features of the components included in the series relate to natural values concerned with coastal systems and biodiversity. IUCN notes that the State Parties of Germany and the Netherlands may wish to discuss the cultural landscape values of the nominated property and the wider area with ICOMOS.

6. APPLICATION OF CRITERIA

The Wadden Sea has been nominated under natural criteria (viii), (ix) and (x)

Criterion (viii): Earth’s history and geological features

The Wadden Sea is a depositional coastline of unparalleled scale and diversity. It is distinctive in being almost entirely a tidal flat and barrier system with only minor river influences, and an outstanding example of the large-scale development of an intricate and complex temperate-climate sandy barrier coast under conditions of rising sea-level. Highly dynamic natural processes are uninterrupted across the vast majority of the property, creating a variety of different barrier islands, channels, flats, gullies, saltmarshes and other coastal and sedimentary features. It is also one of best-studied coastal areas on the planet, providing lessons of wider scientific importance for wetland and coastal management of international importance.

IUCN considers that the nominated property meets this criterion.

Criterion (ix): Ecological processes

The Wadden Sea is one of the last remaining natural large-scale intertidal ecosystems, where natural processes continue to function largely undisturbed. Its geological and geomorphologic features are closely entwined with biophysical processes and provide an invaluable record of the ongoing dynamic adaptation of coastal environments to global change. There is a multitude of transitional zones between land, sea and freshwater that are the basis for the species richness of the property. The productivity of biomass in the Wadden Sea is one of the highest in the world, most significantly demonstrated in the numbers of fish, shellfish and birds supported by the property. The property is a key site for migratory birds, and its ecosystems sustain wildlife populations well beyond its borders.

IUCN considers that the nominated property meets this criterion.

Criterion (x): Biodiversity and threatened species
Coastal wetlands are not always the richest sites in relation to fauna diversity, however this is not the case for the Wadden Sea. The salt marshes host around 2,300 species of flora and fauna, and the marine and brackish areas a further 2,700 species, and 30 species of breeding birds. The clearest indicator of the importance of the property is the support it provides to migratory birds as a staging, moulting and wintering area. Up to 6.1 million birds can be present at the same time, and an average of 10-12 million each year pass through the property. The availability of food and a low level of disturbance are essential factors that contribute to the key role of the nominated property in supporting the survival of migratory species. The property is the essential stopover that enables the functioning of the East Atlantic and the African-Eurasian migratory flyways. Biodiversity on a worldwide scale is reliant on the Wadden Sea.

IUCN considers that the nominated property meets this criterion.

7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopt the following draft decision:

The World Heritage Committee,

1. Having examined Documents WHC-09/33. COM/8B and WHC-09/33.COM/INF.8B2,

2. Inscribes the **The Wadden Sea, Germany / Netherlands,** on the World Heritage List under natural criteria **(viii), (ix) and (x);**

3. Adopts the following **Statement of Outstanding Universal Value**:

Brief Synthesis
The Wadden Sea is the largest unbroken system of intertidal sand and mud flats in the world, with natural processes undisturbed throughout most of the area. It encompasses a multitude of transitional zones between land, the sea and freshwater environment, and is rich in species specially adapted to the demanding environmental conditions. It is considered one of the most important areas for migratory birds in the world, and is connected to a network of other key sites for migratory birds. Its importance is not only in the context of the East Atlantic Flyway but also in the critical role it plays in the conservation of African-Eurasian migratory waterbirds. In the Wadden Sea up to 6.1 million birds can be present at the same time, and an average of 10-12 million pass through it each year.

Criteria
Criterion (viii): *The Wadden Sea is a depositional coastline of unparalleled scale and diversity. It is distinctive in being almost entirely a tidal flat and barrier system with only minor river influences, and an outstanding example of the large-scale development of an intricate and complex temperate-climate sandy barrier coast under conditions of rising sea-level. Highly dynamic natural processes are uninterrupted across the vast majority of the property, creating a variety of different barrier islands, channels, flats, gullies, saltmarshes and other coastal and sedimentary features. It is also one of best-studied coastal areas on the planet, providing lessons of wider scientific importance for wetland and coastal management of international importance.*

Criterion (ix): *The Wadden Sea is one of the last remaining natural large-scale intertidal ecosystems, where natural processes continue to function largely undisturbed. Its geological and geomorphologic features are closely entwined with biophysical processes and provide an invaluable record of the ongoing dynamic adaptation of coastal environments to global change. There is a multitude of transitional zones between land, sea and freshwater that are the basis for the species richness of the property. The productivity of biomass in the Wadden Sea is one of the highest in the world, most significantly demonstrated in the numbers of fish, shellfish and birds supported by the property. The property is a key site for migratory birds, and its ecosystems sustain wildlife populations well beyond its borders.*

Criterion (x): *Coastal wetlands are not always the richest sites in relation to faunal diversity, however this is not the case for the Wadden Sea. The salt marshes host around 2,300 species of flora and fauna, and the marine and brackish areas a further 2,700 species, and 30 species of breeding birds. The clearest indicator of the importance of the property is the support it provides to migratory birds as a staging, moulting and wintering area. Up to 6.1 million birds can be present at the same time, and an average of 10-12 million each year pass through the property. The availability of food and a low level of disturbance are essential factors that contribute to the key role of the nominated property in supporting the survival of migratory species. The property is the essential stopover that enables the functioning of the East Atlantic and the African-Eurasian migratory flyways. Biodiversity on a worldwide*

scale is reliant on the Wadden Sea.

Integrity
The boundaries of the property include all of the habitat types, features and processes that exemplify a natural and dynamic Wadden Sea. The large area of the property encompasses over 66% of the entire Wadden Sea ecosystems and is sufficient to maintain critical ecological processes and to protect the key features and values. However, the inscribed property would be strengthened by its further extension to include the area of the Wadden Sea which lies within the territory of Denmark.

The property is subject to a comprehensive protection, management and monitoring regime which is supported by adequate human and financial resources. Human use and influences are well regulated with clear and agreed targets. Activities that are incompatible with its conservation have either been banned, or are heavily regulated and monitored to ensure they do not impact adversely on the property.

As the property is surrounded by a significant population and contains human uses, the continued priority for the protection and conservation of the Wadden Sea is an important feature of the planning and regulation of use, including within land/water-use plans, the provision and regulation of coastal defenses, maritime traffic and drainage. Key threats requiring ongoing attention include fisheries activities, harbours, industrial facilities and maritime traffic, residential and tourism development and climate change.

Management and protection requirements
Maintaining the hydrological and ecological processes of the contiguous tidal flat system of the Wadden Sea is an overarching requirement for the protection and integrity of this property. Therefore conservation of marine, coastal and freshwater ecosystems through the effective management of protected areas, including marine no-take zones, is essential. The effective management of the property also needs to ensure an ecosystem approach that integrates the management of the existing protected areas with other key activities occurring in the property, including fisheries, shipping and tourism.

Specific long-term expectations for the conservation and management of this property include maintaining and enhancing the level of financial and human resources required for the effective management of the property. Research, monitoring and assessment of the protected areas that make up the property also require adequate resources to be provided. Maintenance of consultation and participatory approaches in planning and management of the property is needed to reinforce the support and commitment from local communities and NGOs to the conservation and management of the property. The State Parties should also maintain their commitment of not allowing oil and gas exploration and exploitation within the boundaries of the property. Any development projects, such as planned wind farms in the North Sea, should be subject of rigorous Environmental Impacts Assessments so as to avoid any impacts on the values and integrity of the property.

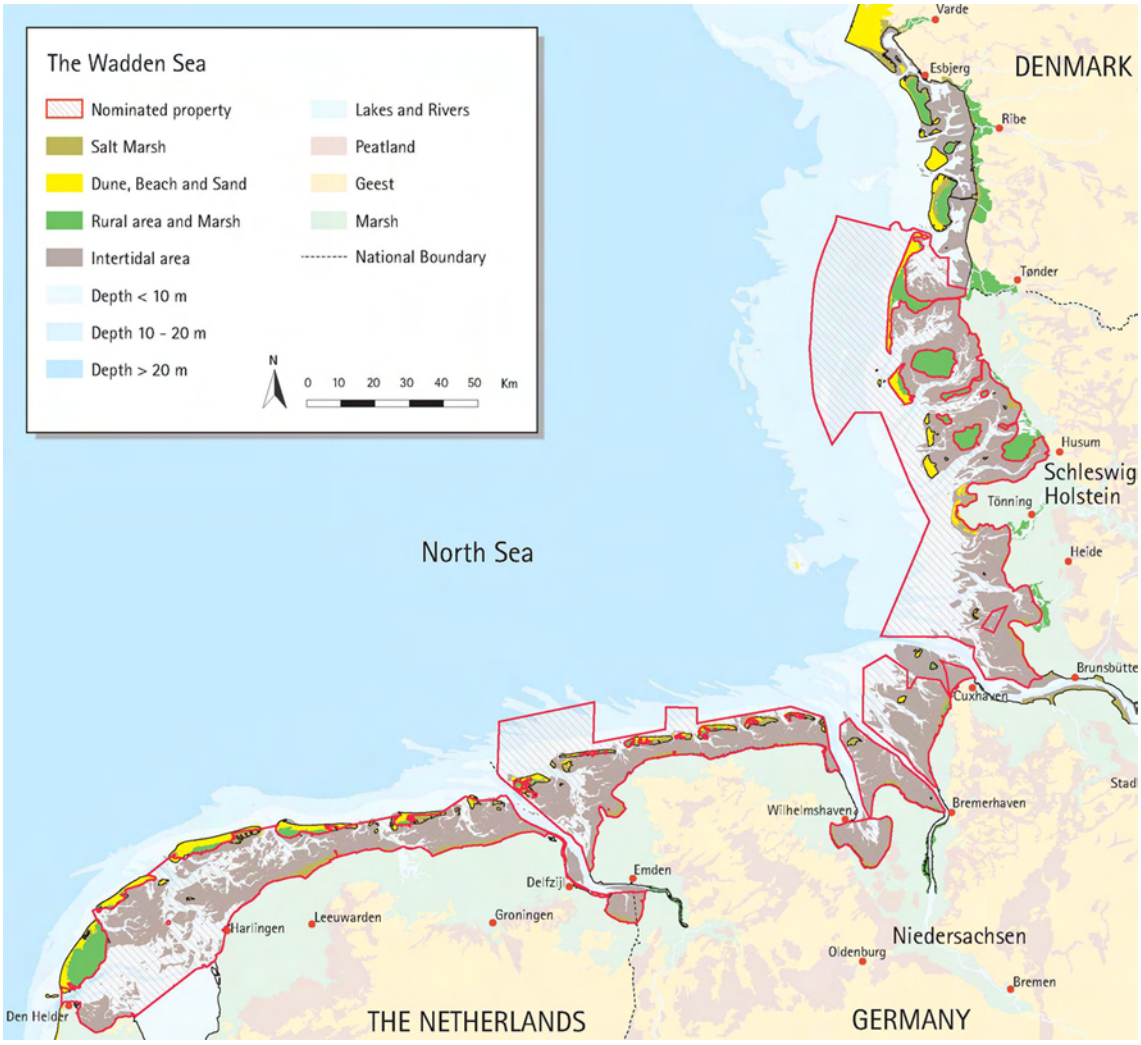
4. Encourages the State Party of Denmark to submit a nomination of the Danish part of the Wadden Sea as soon as feasible to extent and complement the existing property and also encourages the Common Wadden Sea Secretariat as well as relevant experts that participated in the preparation of this nomination to provide support as required to the State Party of Denmark in preparing this nomination;

5. Requests the State Parties of the Netherlands and Germany to prepare and implement an overall Tourism Development Strategy for the property that fully considers the integrity and ecological requirements of the property and that provides a consistent approach to tourism operations in the property;

6. Also requests the State Parties of The Netherlands and Germany to strengthen cooperation on management and research activities with the State Parties of Spain, Tunisia and Mauritania in relation to the conservation of the World Heritage properties of Doñana National Park, Djoudj National Bird Sanctuary and Banc d'Arguin National Park, which also play a significant role in conserving migratory species along the East Atlantic Flyway.

Map 1: General location of nominated property

Map 2: Boundaries of nominated property



Europe / North America

Lena Pillars Nature Park

Russian Federation

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

LENA PILLARS NATURE PARK (RUSSIAN FEDERATION) ID No. 1299

1. DOCUMENTATION

i) **Date nomination received by IUCN:** 15th March 2008.

ii) **Additional information officially requested from and provided by the State Party:** No additional information was requested from or provided by the State Party.

iii) **IUCN/WCMC Data Sheet:** sourced from nomination document which cites over 50 references.

iv) **Additional Literature Consulted:** Pulina, M. (2005) **Le karst et les phénomènes karstiques similaires des régions froides.** in Salomon, J.-N. et Pulina, M. **Les karsts des régions climatiques extrêmes.** Karstologia Mémoires, 14, 11–100; Williams, P. (2008) **World Heritage Caves and Karst.** IUCN; Dingwall, P., Weighell T. & Badman, T. (2005) **Geological World Heritage: A Global Framework.** IUCN / WCPA; Wells R. (1996) **Earth's Geological History: A contextual framework for assessment of World Heritage fossil site nominations**. IUCN, 43pp,

v) **Consultations:** Ten external reviewers. Extensive consultations were undertaken in Yakutia, Russian Federation during the field mission, including with representatives of relevant government agencies, local communities and Non Governmental Organizations.

vi) **Field Visit:** David Sheppard, August 2008.

vii) **Date of IUCN approval of this report:** 17th April 2009.

2. SUMMARY OF NATURAL VALUES

The nominated property of Lena Pillars Nature Park (LPNP) is located in the Republic of Sakha (Yakutia) in the Russian Federation. It is nominated as a serial property comprising two separate but adjacent component parts. One component (404,000 ha) extends over the interfluve of the Lena River and its tributary the Buotama while the other much smaller area (80,970 ha) is on the tributary Sinyaya River basin. The nominated property covers a total area of 484,970 ha. The larger component part is partially bordered by a buffer zone of 868,000 ha.

The area of Central Yakutia is located in the eastern part of the Siberian platform. The lower part of the rock succession in the nominated property includes highly metamorphosed rocks, c. 1.6 billion years in age. The upper part comprises buried sedimentary or, more rarely, volcanogenic pre Cambrian and Phanerozoic rocks. The property has extensive exposures and associated deposits primarily from the early Cambrian Period, a period which marked the first appearance of many groups of organisms and the development of firm skeletons by animals. The fossils at LPNP and in the wider region include numerous remnants of ancient organisms, such as trilobites and molluscs, together with and evidence of a reef complex formed in the warm shallow equatorial waters of a Cambrian sea. The palaeontological features include a continuous sequence of rock layers with an abundance of fossils that is an important record of this time in Earth's history.

The nominated property is of scenic beauty. Both component parts of the property display pillars adjoining the rivers and stretch for more than 30 kilometres along the river banks. The Lena Pillars and the Buotama Pillars are located within the larger component part of the property, and the Sinyaya Pillars in the smaller component part. The scenic values derive large (up to 100m in height) pillars, steeples, towers with niches, passages and caves. Their scenic attraction is enhanced by the riverine setting surrounded by an expanse of boreal forest. These combine to provide an impressive natural landscape which is renowned within Yakutia and within Russia. Some of the pillars are known locally as the Kihi Taas (stone men) and were remarked on by early 19th century Russian travelers such as N. Schukin and the poet A.A.Bestuzhev-Marlinsky.

Karst terrain is widespread throughout the property and in the wider region. Thermokarst and associated relief forms are an important feature within the nominated property, and in the wider region. The karst values are relatively little discussed within the nomination, although they are noted as of some interest in a recent IUCN global thematic study on caves and karst.

The territory of the park is covered mainly by low larch taiga (87%) and pine forests (c. 8%), with other forest types comprising the balance. There are 464 recorded species, 276 genera and 81 families of vascular plants recorded within the nominated property. In areas of psammophyte vegetation there are so called “tukulans”, which are areas of wind blown semi-stabilized and stabilized sands. The largest tukulan, the Saamys Kumaga, is a conspicuous feature of the nominated property. A number of nationally rare and endangered species are found within the property, including an endemic species *Redowskia sophiifolia*. The nominated property includes 40% of the total flora of Yakutia, with 202 species of frondiferous mosses, 34 species of liverwort and a notable diversity of algae.

The fauna within the nominated property includes species found within the mountain taiga and mountain steppe ecosystems, including musk deer, Siberian stag and the northern mouse hare. 38 mammal and 105 bird species are recorded within the nominated property, including 80% of the nesting birds of Central Yakutia. Additional species are found in the nominated property during seasonal migrations, and there are several important bird species within the property, including the Baikal teal, osprey, golden eagle and peregrine.

3. COMPARISONS WITH OTHER AREAS

Impressive systems of rock pillars are found in many other parts of the world. A number of such landscapes are already recognised on the World Heritage List including the Shilin Stone Forest component of the South China Karst (China), Ha Long Bay (Vietnam), Nahanni National Park (Canada) and the Tsingy de Bemaraha Strict Nature Reserve (Madagascar). Other renowned landscapes, not included within the World Heritage List, and with extensive pillar landforms include Nambung National Park (Australia), Arches National Park (USA) and Bryce Canyon (USA). The extensive riverside ruiniform relief found in the Causses et Cévennes (France) is also a comparator.

Although not all of these are exactly equivalent to the Lena Pillars and not all are in karst terrain, IUCN notes that both inscribed World Heritage properties and other properties that are not inscribed present more extensive and varied pillar landscapes than those within the nominated property. There is no compelling evidence for acceptance of the aesthetic values of the Lena Pillars as supporting a claim for Outstanding Universal Value, although they may be unequalled in north-eastern Eurasia.

There are a number of aspects of the earth science values to be assessed through comparative analysis, including the fossil values and the karst landforms including the distinctive erosion pillars along the major river banks.

The fossils values of the nominated property are abundant, of high quality and readily accessible. They provide a record of life in the Early Cambrian period, at a time of the radiation of complex life on Earth. However, the palaeontological record of the nominated property is not the world standard for comparison and correlation of Early Cambrian sedimentary rocks. Some reviews comments note that there are other sites along the Lena River and elsewhere in Siberia that may provide an equivalent or better geological record of the Cambrian. Reviewers note that comparable Cambrian sites are also found in S.E. Newfoundland (Canada), Morocco, China, South Australia and parts of Europe. There are prominent exposures of Cambrian rocks in other World Heritage properties such as the Grand Canyon (USA).

More significantly, the World Heritage List already includes the Burgess Shale fossil site and the Canadian Rocky Mountain Parks (Canada), which are widely accepted as the global reference for the Cambrian Explosion. It covers a different part of the Cambrian and is regarded as the global benchmark for demonstrating the divergence of fossil life, with exceptionally preserved fossils and an iconic status as a place of first discovery. Other Cambrian fossil sites with exceptional soft body preservation that are not included on the World Heritage List are also known from China, such as Chengjiang (Yunnan Province) and the Doushantuo Formation (Guizhou Province).

Remains of mammoth fauna from the Pleistocene Ice Ages are also considered in the nomination to be notable, but in addition to this being too narrow a basis for inscription on the World Heritage List, it is known that there are better sites with mammoth remains throughout Siberian permafrost.

Application of the standard IUCN checklist for evaluating the World Heritage fossil sites (see Appendix 1 to this report) does not support a case for the fossil features of LPNP to be regarded as of Outstanding Universal Value.

The karst landscapes in the nominated property and in particular the riverbank pillars are of geomorphological interest. However, a scientific review of karst landscapes in cold-climate regions reveals that the nominated property is only one area of karst among many along the Lena River. Moreover, even though the karst landforms are significant within the property, their characteristics and geomorphic development are not described in detail or their level of international significance assessed in the nomination. IUCN’s recent (2008) thematic study of caves and karst considered all karst sites identified

on the tentative lists of States Parties. It concluded that the Lena Pillars are of interest in relation to the representation of karst values on the World Heritage List, but unlikely to be acceptable as World Heritage on the basis of physical karst alone.

The main ecosystems within the nominated property types comprise an interlinked mixture of northern taiga forests, bogs, and rock habitats. These ecosystems are typical for the region and, in particular, for a site at the interface between the Eurasian forest and tundra zones. Tukulan ecosystems are widespread within the nominated property and are an important natural feature. However they are also found in other areas within the region, and similar ecosystems also occur in the boreal zone of the northern hemisphere.

The property is situated along one of the world's largest rivers, the Lena River. The combination of boreal ecosystems, mountain elements and riverine influence create a mosaic which is very interesting but, in the context of the nominated property, the significance is more at a regional than a global level. From the point of the view of natural values, there are much more significant parts of the Lena River, and notably the Lena River delta.

Some 464 vascular plant species are reported, of which 21 are regarded in the nomination document as rare or endangered. However, this statement refers to regional or national Red Lists within Russia and is not indicative of global significance. Some of these species are widespread over the northern part of the palearctic realm. Only one species, *Redovskia sophiifolia* is regionally endemic.

The fauna is typical of the region. However, the biodiversity values do not approach those within properties included on the World Heritage List, and do not appear to include species that are endangered at the global level. The Lena Pillars site do not compare with sites such as the Shiretoko (Japan) property in relation to the density of brown bears. Based on the nomination document, it is surprising that some typical species appear to be missing, such as the wolf, wolverine and lynx. The reptile and amphibian fauna are generally common within the region and do not include threatened or endangered species. Overall, the biodiversity values of the property are assessed as having significance at a sub-national rather than a global level.

Based on the above comparative analysis, IUCN considers that the property does not provide a compelling case to be regarded as being of Outstanding Universal Value in relation to natural criteria.

4. INTEGRITY

4.1 Protection

The nominated property has the status of a Nature Park of the Republic of Sakha. It is administered under State and Republic Law, including the Law on the Specially Protected Natural Areas in the Republic of Sakha (Yakutia). Legal instruments for the protection of the property are determined by the regulations of the Nature Park confirmed by the Government of the Republic of Sakha (Yakutia).

The Lena Pillars Nature Park is also classified as a national nature reserve under the jurisdiction of the Republic of Yakutia. According to Russian legislation it is a Nature Park, which combines elements of the IUCN Category II and Category III Protected Area. Natural World Heritage properties are expected to be protected at the highest possible level. In Russia this would normally correspond to a federally protected "zapovednik" or equivalent. The Lena Pillars property is not protected at this level currently and the IUCN mission team discussed this issue with the relevant national and republic authorities and were advised that the protection of the Lena Pillars Nature Park has the highest level of political and administrative support within the Republic. This was confirmed in meetings with the President and the Vice President of the Republic.

IUCN considers the protection status of the nominated property meets the requirements set out in the *Operational Guidelines*.

4.2 Boundaries

The boundaries of the property are not effective for ensuring protection of the natural values and resources of the park because they mostly follow the river course rather than the catchment boundaries. Thus they are not sufficient to protect the property from external impacts, especially those from upstream. The buffer zone extends along only one side of the larger component of the serial property, and there is no buffer zone delimited for the smaller component. The boundary of the nominated property follows the right bank of the river, and excludes both the Lena River and its floodplain. A larger area including a boundary tied more clearly to the natural features and processes that support the nominated property would be necessary to fully meet the relevant conditions of integrity. This is particularly the case in relation to the biodiversity values for which the property is nominated, but is also relevant to the karst and landscape values.

IUCN considers that the boundaries of the nominated property do not meet the requirements set out in the *Operational Guidelines*.

4.3 Management

There is a management plan for the nominated property, as required under the Russian Ministry of Natural Resources 2007 Direction No. 491. This plan identifies key values of the property and priorities for management. This document is adequate to guide management of the nominated property. The Nature Park is divided into four functional zones: (1) Preservation Regime Zone; (2) Recreational Zone; (3) Traditional Management Activity Zone (which cover lands of nomadic ancestral farms); and (4) Regulated Management Zone.

The total budget for the park is approximately $460,000 USD, which is mainly funded directly from the Republic of Yakutia (about $425,000) and also from self-generated revenue, largely from tourism. The budget appears adequate for the existing management of the Nature Park, however revenue levels will need to be increased in the future, particularly to effectively manage an anticipated greater numbers of tourists.

LPNP had 36 staff in 2007, which appears to be an adequate number for meeting current and projected future management requirements. There is close co-operation with other relevant agencies, for example assistance with fire management activities in summer is provided through the “Yakutia Aircraft Fire Extinguishing Brigade”. Assistance with law enforcement is provided through the “Special Poaching Inspection Unit” of the Ministry of Environmental Protection.

IUCN considers the management of the nominated property meets the requirements set out in the *Operational Guidelines*.

4.4 Threats and Issues

There are some traditional use activities within the property, including hunting of sable, horse breeding at the Boutama river mouth, and haymaking. Such activities are carefully regulated and managed and have limited environmental impact. Fire control poses a challenge for management within the nominated property. For example, in summer 2001 a thunderstorm caused 11 forest fires, which extended over much of the property. There are also some recurrent unauthorised grassland fires during the spring season. There is a need to strengthen fire controls over the agricultural lands in spring and summer. In addition, cooperative arrangements with relevant Forestry authorities, including Khangalassky Forestry, should be strengthened.

Tourism has been very limited to date and is currently of the order of 10,000 person visits per year. There are facilities developed in a number of areas of the Nature Park, in some cases in partnership with NGOs such as WWF. An upper limit of 23,000 person visits per year has been established for the nominated property. There is active promotion of the area, including through television programmes, printed promotional material, and various educational programs run with students of local village schools. There are proposals to develop more tourist infrastructure within the Nature Park and it is important that this be carefully planned and developed in an environmentally sensitive manner and also in full consultation with local communities. IUCN recommends that an ecotourism master plan be developed for the nominated property which: (a) maintains the current focus on low-key tourist operations, based on the appreciation of natural values; (b) provides for direct and adequate financial contributions from tourism to the cost of conservation and community development activities within and adjacent to the nominated property; and (c) closely involves relevant local authorities and other major stakeholders.

IUCN understood from its mission that there is a proposal to construct a major oil pipeline to cross the Lena River 800 km upstream from the nominated property. It is understood that this will involve two underwater pipelines crossing the Lena River and that options are currently being considered regarding its design. This proposal creates risks of oil spillage associated with damage to the oil pipelines, including cracking of pipes in the winter. There have been concerns expressed about the environmental impact from oil spills to the Lena River and some NGOs have been actively involved in highlighting the potential impacts of the pipeline on the Lena River. The State Party advised that the environmental impacts of the oil pipeline are being carefully considered and that all appropriate environmental impact assessment procedures will be applied.

There are some threats from the cement works in the Mokhsogollokh village located 15 km northeast of the Buotama River, which relate to cement dust that can reach the perimeter of the property. Although the overall impacts on the property are likely to be very limited there should be efforts to better regulate this source of pollution.

In summary, IUCN considers the nominated property does not meet the conditions of integrity as outlined in the *Operational Guidelines*, as it is not of an adequate size to ensure the complete representation of the features and processes which convey the property’s significance.

5. ADDITIONAL COMMENTS

5.1 Justification for serial approach

a) What is the justification for the serial approach?

Considering that the two components are adjoining areas that protect the same geographical features, a serial approach does not appear to be as effective in this case as the nomination of a single larger area.

b) Are the separate component parts of the nominated property functionally linked in relation to the requirements of the *Operational Guidelines*?

The two components are both part of the same hydrological catchment. They also have a common geological origin and evolutionary history.

c) Is there an effective overall management framework for all the component parts of the nominated property?

The two components of the serial nomination that make up the Lena Pillars Nature Park are administered as a single protected area and managed under a common management plan. This meets the expectations regarding an overall management framework for a serial property.

5.2 Karst values

IUCN notes that the karst values of the property were mentioned within a thematic study of World Heritage Caves and Karst published in 2008. This study concluded that the property on its own could probably not sustain a nomination for its karst values alone. IUCN also notes that the thematic study considered that karst in permafrost areas is one of the small number of remaining gaps in relation to the recognition of karst sites on the World Heritage List. Although the nominated property does not provide a basis for such recognition, it may be worth the State Party examining the potential for identifying, with appropriate international advice, whether there is potential to consider the concept of a more significant karst nomination being developed within the region.

6. APPLICATION OF CRITERIA

Criterion (vii): Superlative natural phenomena or natural beauty

The claim under this criterion is based primarily on the scenic values of the rock pillars and towers of the Lena Pillars, and the other pillars within the nominated property. The pillars are certainly of scenic value and an attraction to visitors. However there are many other spectacular landscapes of greater scale within existing World Heritage properties, and elsewhere, and the nominated property does not stand out in this regard. The pillars occupy a small portion of the nominated property. Limited evidence is presented of recognition in national arts and culture.

IUCN considers that the nominated property does not meet this criterion.

Criterion (viii): Earth's history, geological and geomorphic features and processes

Lena Pillars National Park is an important geological site with features of international interest. These include the stratigraphic and palaeontological record of the Cambrian Period on a stable carbonate platform. However it is not possible to support the contention that the LPNP is a geological world standard, and other known sites including the Burgess Shale are of greater significance in relation to their Cambrian fossil values. The erosional pillars are significant and may be unparalleled in the north Eurasian context, but there is no evidence that they are distinctive at the global level, and a global study of caves and karst concluded that, alone, the karst values of the nominated property are not sufficient to provide a basis to be regarded as of Outstanding Universal Value. The boundaries of the property do not meet the requirements of integrity for a karst site. The values within the property, together with a wider area might provide a basis for recognition as a UNESCO Geopark, and this might be usefully discussed further with the science sector of UNESCO.

IUCN considers that the nominated property does not meet this criterion.

Criterion (ix): Ecological processes

The nominated property contains an interlinked mixture of ecosystems including northern taiga forests, bogs, and rock habitats. These ecosystems contain important natural values at the regional level, but are typical of a much larger region and not of Outstanding Universal Value. The boundaries of the property do not respond to the ecological requirements of the ecosystems included in the property.

IUCN considers that the nominated property does not meet this criterion.

Criterion (x): Biodiversity and threatened species

The fauna found within the nominated property is typical of the region, however does not contain species that are endangered at the global scale. The property contains one regionally endemic species and no species endemic to the property only. The nominated property is considered to be of national/

regional significance in relation to its biodiversity values.

IUCN considers that the nominated property does not meet this criterion.

7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopt the following draft decision:

The World Heritage Committee,

1. Having examined Documents WHC-09/33.COM/8B and WHC-09/33.COM/INF.8B2,

2. Decides not to inscribe **Lena Pillars Nature Park, Russian Federation,** on the World Heritage List on the basis of natural criteria;

3. Commends the State Party for its efforts in protection and management of the Lena Pillars Nature Park, and encourages the State Party to continue these efforts, consider the options for extension of the Park and to develop a plan with an increased budget for management of the growing ecotourism activities.

Appendix 1

IUCN Fossil Site Evaluation Checklist for Lena Pillars

1. Does the nominated property provide fossils which cover an extended period of geological time (i.e. how wide is the geological window)?

The key fossil bearing horizons cover a period from the lower Cambrian to middle Cambrian, a period of 30-40 million years.

2. Does the nominated property provide specimens of a limited number of species or whole biotic assemblages (i.e. how rich is the site in species diversity)?

Whole fossil assemblages are present, with eight phyla represented and more than 1,000 described species of biota. A range of palaeoenvironments is represented including lagoon, barrier reef and marine basin. The fossil diversity is high, but not at the highest levels for a fossil site representative of the key features of the record of life during the Cambrian Period.

3. How unique is the nominated property in yielding fossil specimens for that particular period of geological time (i.e. would this be the type locality for study or are there other similar areas that are alternatives)?

The property is considered to be the type locality for the lower Cambrian in Russia, and a candidate global stratotype within the International Geoscience Programme, however it is not unique in providing a fossil record of the Cambrian period.

4. Are there comparable sites elsewhere that contribute to the understanding of the total "story" of that point in time/space?

Other comparable sites are considered to demonstrate a better record of the early Cambrian e.g. Chengjiang (China). The Burgess Shale (Canada) is recognised as the world icon for the record of the radiation of complex life during the Cambrian period. There are many known Cambrian fossil sites world wide.

5. Is the site the only or main location where major scientific advances were (or are being) made that have made a substantial contribution to the understanding of life on earth?

Hundreds of scientific papers have been written over a 50-year study period, mostly within Russian language journals, which limits the international profile of the property. The nominated property is not the only or main location where major advances are being made in relation to the fossil record of the Cambrian Period.

6. What are the prospects for on-going discoveries at the nominated property?

There are prospects, although these are relatively limited. There is some potential for discovery of further soft-bodied specimens

7. How international is the level of interest in the nominated property?

This nominated property is of interest to international researchers but not at the highest levels. Several international field excursions have been hosted in recent years.

8. Are there other features of natural values (e.g. scenery, landform, vegetation) associated with the nominated property (i.e. does there exist in the adjacent area modern geological or biological processes that relate to the fossil resource)?

Erosional pinnacle landforms in carbonate rocks of scenic importance.

9. What is the state of preservation of specimens yielded from the nominated property?

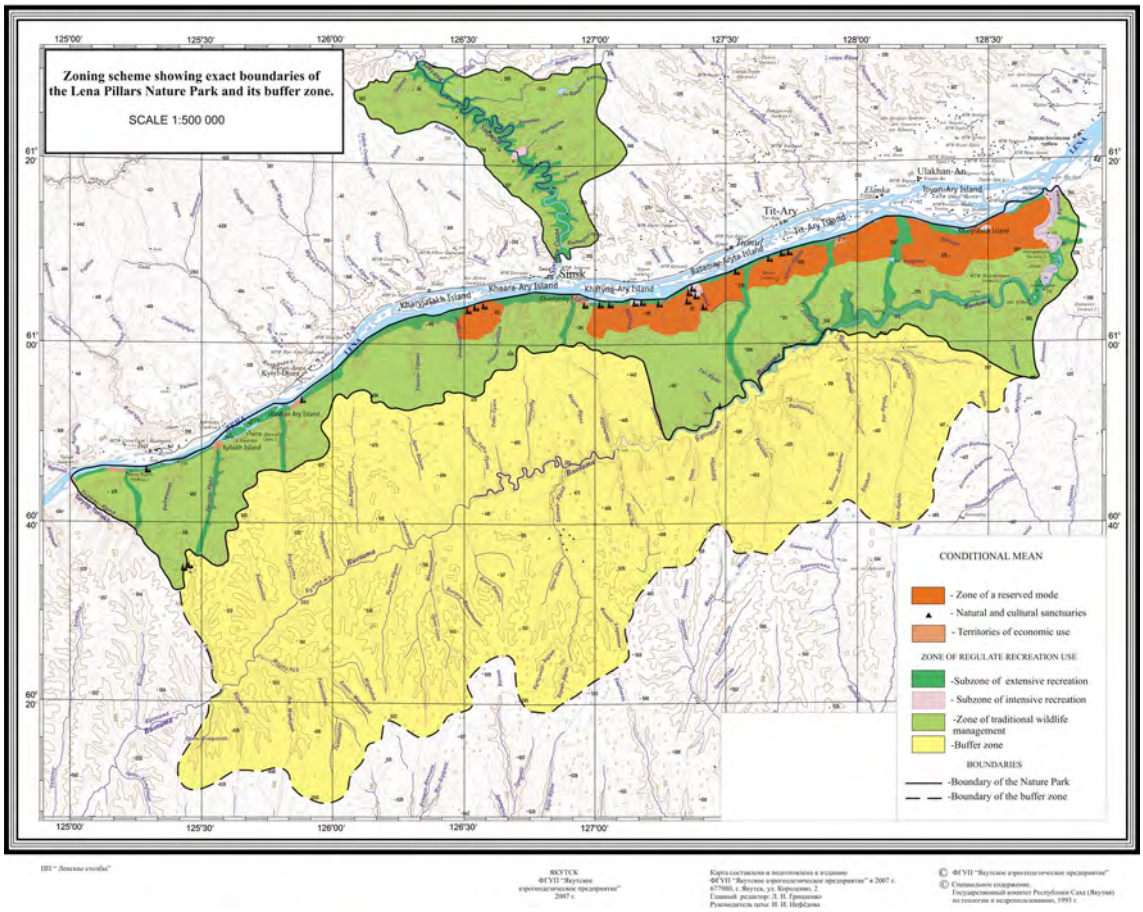
Mostly good and some soft-body material is notable. Little alteration by diagenesis so microstructures can be studied in detail.

10. Do the fossils yielded provide an understanding of the conservation status of contemporary taxa and/or communities (i.e. how relevant is the nominated property in documenting the consequences to modern biota of gradual change through time)?

Not applicable.

Map 1: General location of nominated property, boundaries and buffer zone

Map 2: Boundaries and buffer zone of nominated property



A2 Deferred Nominations of Natural Properties

Europe / North America

The Dolomites

Italy

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

THE DOLOMITES (ITALY) – ID No. 1237 Rev

Background note: The nomination of the Dolomites was originally submitted in January 2006 and comprised a serial nomination of 27 component parts covering an area of 126,735.45 ha. Following discussion during the evaluation process at that time, the State Party subsequently submitted a revised nomination document consisting of 13 component parts of varying sizes, and this was considered by the World Heritage Committee at its 31st Session (Christchurch, 2007). Following the recommendations of IUCN, the nomination was deferred, and the State Party was advised to refocus the nomination around criteria (vii) and (viii), considering the aesthetic, geological and, in particular, geomorphological values of the Dolomites, and with a reduced number of more coherent components to convey these values at a landscape scale. Subsequently, on 29 January 2008, the State Party submitted a new and revised nomination including a series of nine component parts of varying sizes, which is the subject of this evaluation.

1. DOCUMENTATION

i) Date nomination received by IUCN: 15th March 2008.

ii) Additional information officially requested from and provided by the State Party: IUCN requested supplementary information on 1st October 2008 following its evaluation mission, and on 10th December 2009 following consideration by the World Heritage Panel. The State Party submitted supplementary information on 27th February 2009 to provide consolidated responses to these requests.

iii) IUCN Data Sheet: Sourced from nomination document.

iv) Additional literature consulted: Embleton, C. (ed.) (1984). **Geomorphology of Europe.** Macmillan, London; Hancock, P.L. and Skinner, B.J. (eds.) (2000). **The Oxford Companion to the Earth.** Oxford University Press; Dingwall, P. and Badman, T. (2005). **Geological World Heritage: A Global Framework.** IUCN; Thorsell, J. and Hamilton, L. (2002). **A Global Overview of Mountain Protected Areas on the World Heritage List.** IUCN; Weidert, W.K. (ed.) (2001). **Klassische Fundstellen der Paläontologie.** Goldschneck Verlag, Korb.

v) Consultations: 9 external reviewers in 2008-2009 (in addition to 9 external reviewers in 2006-2007). Extensive consultations were undertaken during the earlier and the present field visit with representatives of local governments and authorities, technical staff working in the different nature parks and reserves, geology, geomorphology and landscape experts, researchers and with other stakeholders in the property, including representatives of local communities and economic interests.

vi) Field visit: Martin Price and Bastian Bomhard, September 2008.

vii) Date of IUCN approval of this report: 27th April 2009.

2. SUMMARY OF NATURAL VALUES

The Dolomites are a mountain range in the northern Italian Alps, including 18 peaks which rise to above 3,000 m. The nominated property comprises a series of nine component parts that together are regarded by the State Party as encompassing the most significant landscape and earth science values of the Dolomites mountain range as a whole. The areas exclude significant infrastructure, mainly associated with tourism. The total area of the nominated property is 141,903 ha. Buffer zones surround each of the different component parts and together include an area of 89,267 ha. The buffer zones do not form part of the nominated serial property, but are designed to support its conservation. The names and areas of the different component parts of the nominated property are provided in Table 1.

The landscapes and geomorphology of the Dolomites are characterised by vertical walls, with sheer cliffs which are sometimes over 1,500 m in height, and a high density of extremely narrow, deep and long valleys. The density of pinnacles, peaks and towers, almost always reaching hundreds of metres in height, is a dominant feature of the landscape. The

Table 1: Area of the of the nominated property and buffer zones.

	Name of component part of nominated property	Area of component part (ha)	Buffer zone (ha)	Province
1	Pelmo-Croda da Lago	4,343.6	2,427.3	Belluno
2	Marmolada	2,207.5	578.0	Trento, Belluno
3	Pale di San Martino – San Lucano – Dolomiti Bellunesi – Vette Feltrine	31,665.7	23,668.9	Trento, Belluno
4	Dolomiti Friulane / Dolomits Furlanis e d'Oltre Piave	21,460.6	25,027.6	Pordenone, Udine, Belluno
5	Dolomiti Settentrionali / Nördliche Dolomiten	53,586.0	25,182.3	Trento,, Bolzano, Belluno
6	Puez-Odle / Puez-Geisler / Pöz-Odles	7,930.3	2,863.5	Bolzano
7	Sciliar-Catinaccio / Schlern-Rosengarten – Latemar	9,302.1	4,770.7	Trento, Bolzano
8	Rio delle Foglie / Bletterbach	271.6	547.4	Bolzano
9	Dolomiti di Brenta	11,135.4	4,201.0	Trento
	Total	**141,902.8**	**89,266.7**	

characteristic rock type of the range is dolomite (also called dolostone or dolomitic limestone), a carbonate rock formed from the mineral dolomite (Calcium Magnesium Carbonate). The rock type, mineral, and the Dolomite mountain range itself are named after the 18th century French mineralogist Déodat de Dolomieu, who was the first to describe dolomite from this area. Mountains developed in this mineral cover much of the property and are distinctive due to their pale colour. The nominated serial property comprises a diversity of landscapes that are spectacular not only because of their physical characteristics, but which also responds to natural changes in light to create views of great natural beauty.

The landscapes of the Dolomites also have a renowned international significance for geomorphology. There is a wide range of different types of terrain with varying erodibility and geo-mechanical characteristics, producing diverse landforms and illustrating many different processes. Most notable are the distinctive landforms created in the extensive dolomitic rocks that include many steeples, pinnacles, and rock walls. The property also contains interesting glacial landforms, as well as karst systems. A further key feature is the dynamic nature of the landscape creating frequent landslides, floods, and avalanches.

The geological significance of the Dolomites lies in its representation of a large part of the Mesozoic Era in a continuous manner, as well as some sequences of earlier and later stratigraphy. The nominated property contains important reference areas for the Triassic period and one of the best examples of the preservation of Mesozoic carbonate platform systems, including accompanying fossil records of reef-building organisms. The sequence documents recovery and evolution of life following the largest recorded extinction event in geological time at the boundary of the the Permian Triassic periods, and interaction between volcanism and carbonate sedimentation. There are a number of sequences within the nominated property which are regarded as type sections and the Ladinian stage of the Triassic period takes its name from a location in the Dolomites. As a whole, the Dolomites permit the accurate reconstruction of the evolution of a passive continental margin (a margin between land and sea that does not feature a subduction zone, such as the modern day Atlantic margin of North America) and successive phases of continental collision and evolution over more than 250 million years.

The nomination provides an extensive and detailed technical summary of the values of the property. The description does not provide for easy understanding of the values of the property, nor make it easy to distinguish the features of the greatest significance from those of local or regional importance. However it does, as a whole illustrate the combination of geomorphological and geological values that taken together give the nominated property a long established and exceptional international importance for the earth sciences. A summary of some of the features emphasised in the nomination within each of the nominated component parts is provided in Table 2.

Pioneering studies on stratigraphy, mineralogy, sedimentology and palaeontology have been undertaken in the Dolomites by leading geologists since the 18th century. The area has provided a natural laboratory for a large number of scientists who have studied and worked here, including Giovanni Arduino (1714-1795), Déodat de Dolomieu (1750-1801),

Table 2: Key features of the component parts of the property

Name of component part of nominated property	Key features (brief summary)
1. Pelmo-Croda da Lago	• Dramatic landscape with wide range of landforms including towers, plateaux, ledges and landslides, and evidence of last glacial maximum. • Late Permian to early Jurassic succession, presenting rock and fossil records, tectonic and sedimentological across an interval of c.100 million years.
2. Marmolada	• Includes the highest summit of the Dolomites (3343m), known as "the Queen of the Dolomites", a rocky massif with high relief and vertical walls. • Geological record of Triassic sedimentary platform and overlying volcanic sediments.
3. Pale di San Martino – San Lucano – Dolomiti Bellunesi – Vette Feltrine	• Horseshoe-shaped component with typical dolomite landscapes including cliffs, plateaux, valleys, pinnacles and walls. • One of the most complete stratigraphic series of the Dolomites from early Palaeozoic to the Cretaceous.
4. Dolomiti Friulane / Dolomits Furlanis e d'Oltre Piave	• Many sheer rock walls, pinnacles, towers and valleys. • Stratigraphic succession dominated by dolomitic-calcareous rocks with repeated stratigraphy due to faulting.
5. Dolomiti Settentrionali / Nördliche Dolomiten	• Extensive areas of mountainous topography. Three main mountain groups, with significant plateaux in the northwestern part and rocky cliffs further south. • The most complete stratigraphic sequence of the Dolomites, with three dimensional exposures of carbonate platforms. Fossil records of international significance documenting recovery of life after the Permian-Triassic extinction, and include important reef and plant fossil remains.
6. Puez-Odle / Puez-Geisler / Pöz-Odles	• Two large dolomite plateaux isolated by sheer escarpment ridges and with some of the highest peaks of the Dolomites, and displaying a typical dolomite landscape. • Well preserved stratigraphic succession with little deformation, and internationally important stratigraphic and fossil bearing horizons.
7. Sciliar-Catinaccio / Schlern-Rosengarten – Latemar	• Wide variety of landforms with sheer dolomite peaks and high relief. • Key Triassic stratigraphic and palaeontological localities, including the Latemar Reef exposure of an isolated carbonate platform, subject of many international studies.
8. Rio delle Foglie / Bletterbach	• Deep and meandering gorge, creating the important exposure of geology that is the key value of this component. • Well exposed succession of Permian-Triassic rocks, particularly important for documenting Permian palaeoenvironments and trace fossil remains of vertebrate life at that time.
9. Dolomiti di Brenta	• Spectacular structural and climatic landforms including rock towers, steeples, ledges, cirques, landslides and a well developed karst system. • Extensive exposures document the structural and stratigraphic evolution of the south alpine passive margin and tectonic history of the Dolomites.

Alexander von Humboldt (1769-1859), Leopold von Buch (1774-1855), Edmund von Mojsisovics (1839-1907) and Ferdinand von Richthofen (1833-1905). The nomination also presents a range of artistic responses to the Dolomites such as the work of Albrecht Dürer (1471-1528) and Johann Wolfgang von Goethe (1749-1832), which emphasise the long standing regard for the landscapes within the nominated property.

Although not a primary basis of the nomination, the nominated property includes areas of national and regional importance for biodiversity. The flora of the Dolomite region includes c. 2,400 plants. The nominated property does not include areas representing all of this floristic diversity, however most of its components have important flora, for instance the Dolomiti Bellunesi alone has 1,350 species, a quarter of Italy's flora, and 55 forest types. As with the flora, the fauna is typical for the region, but it is very diverse due to the great number of different habitats, altitudinal levels and the region's pivotal biogeographic location. Two major factors stand out. A gradual recolonisation of remoter areas by large carnivores is occurring, and has been facilitated by a diminishing human use and disturbance of both valley lands and alpine pastures. This has encouraged the return of animals such as bear and lynx, previously killed to protect livestock. This diminution of use also encourages the upward and downward spread of forest on the slopes, potentially enhancing the resilience of the area to climate change.

3. COMPARISONS WITH OTHER AREAS

IUCN starts its comparative approach to this nomination from the standpoint of identifying whether the Dolomites as a whole (as opposed to the individual component parts nominated) can be considered to be a mountain area of potential Outstanding Universal Value.

The Dolomites are widely regarded as one of the most attractive parts of the European Alps, although they are far from being the highest, or containing the largest glaciers. Their reputation is due to the combination of the colour of the rocks, varying at different times of day and in different weather conditions, and their verticality and variety of form. The degree of dissection of the landscape, with broad valleys between near-vertical cliff faces, makes the mountains unusually accessible and visually impressive. Comparable areas in the Alps include the northern calcareous Alps in Austria and Germany, and the calcareous western pre-Alps in France. However, these mountain areas are less impressive and colourful than the Dolomites. The values within the Dolomites are clearly distinct from the World Heritage property of Swiss Alps Jungfrau-Aletsch in Switzerland, due to the entirely different mountain topography and relative lack of glaciers. Elsewhere in Europe, the mixed World Heritage property of the Pyrénées - Mont Perdu (France and Spain) has spectacular limestone formations.

There are many spectacular mountain landscapes elsewhere in the world, and more than 60 mountain areas are already inscribed as natural or mixed properties on the World Heritage List. However, these differ significantly from the Dolomites in terms of either their geology (e.g., volcanic rocks: Kamchatka, Russia, Hawaii Volcanoes National Park, USA, Tongariro National Park, New Zealand, Teide National Park, Spain) and/or their climatic conditions (e.g., Los Glaciares, Argentina, Canaima National Park, Venezuela). As the glaciers which remain in the Dolomites are rather small, sites which are principally glaciated at the current time, such as Sagarmatha (Nepal) are not comparable. Amongst limestone mountain ranges, notable properties include those in North America, where spectacular limestone mountains are found in Waterton Glacier International Peace Park (Canada and USA) and the Canadian Rocky Mountain Parks.

The distinct and dominant landscape feature of the Dolomites is their spectacular limestone features such as pinnacles, peaks and towers, almost always reaching hundreds of metres in height. Such a concentration of spectacular towers, peaks and pinnacles and high vertical walls (e.g. Agner, Burel, Civetta, Marmolada, Sass Maor, Torre di Luganaz, Tofane) is outstanding in the global context. The Agner north wall is almost comparable in height with the famous Eiger north wall (1,800 m) in the Swiss Alps Jungfrau-Aletsch property, and one of the highest walls in any limestone mountains in the world. These features are both the basis for the application of criterion vii, and viii in relation to the geomorphological values of the property. Supporting evidence from IUCN's desk reviews, evaluation mission and the material in the nomination regarding the physical landscape of the property and the responses over time to its natural beauty in the form of paintings and other artwork provide important supporting evidence for the application of criterion vii to the nominated property.

The most important interval of the stratigraphic succession within the Dolomites is that of the Permo-Triassic period, including its record of the Permian/Triassic boundary. The nomination notes that this interval of time is well represented in other mountain areas including in Switzerland, Germany, Austria, Hungary, Slovenia, Canada and the USA, and parts of the Himalayan range. Whilst these values are significant for geologists, IUCN notes that stratigraphic boundary sites have previously been regarded as potentially too large a topic for World Heritage listing.

Whilst the Dolomites can be regarded as one of the world's important Mesozoic successions, others of equal importance in different depositional environments are found in many other countries and continents. The Dorset and East Devon Coast World Heritage property (United Kingdom) contains a succession through the Triassic, Jurassic and Cretaceous periods, in combination with a number of internationally important vertebrate fossil sites and classic coastal geomorphology. Fossil values of the Triassic period are already included on the World Heritage List in the Ischigualasto / Talampaya Natural Parks (Argentina) and Monte San Giorgio (Switzerland). The values of these properties, which are unequalled in their display of vertebrate fossils, exceed those of the Dolomites in conveying the diversity of terrestrial and marine life in the Triassic period.

Nevertheless, the nomination presents a detailed argument, supported by comparative analysis of 19 other areas around the world, that the Mesozoic carbonate platforms ("fossilized atolls") of the Dolomites are of global significance, particularly in terms of the evidence they provide of the evolution of the bio-constructors after the Permian/Triassic boundary and of the preservation of depositional geometries and original relationships between the bio-constructed bodies and their surrounding basins. IUCN considers that the stratigraphic and fossil values are not, on their own, sufficient to be regarded as of Outstanding Universal Value, however they are an important supporting factor in considering the application of the relevant World Heritage criteria.

Lastly, IUCN notes that the property has also been subject to a rigorous process of comparative analysis in relation to the selection of the nine component parts within the wider Dolomites region. Overall there is an excess of detailed information on the individual component parts of the property within the nomination. However, the synthesis of the series as a whole is well done, and IUCN notes the presentation of a clear diagram showing the contribution of each component part to the values within the series as a whole as an innovative example of good practice. IUCN recommends that this diagram is noted as an example for application in other serial properties, and has therefore included it as an annex to this evaluation report.

In summary, on the basis of the above comparative analyses, IUCN concludes that the Dolomites can comfortably be argued to respond to the requirements of natural criterion (vii) in relation to their aesthetic values. The geomorphological values of the Dolomites, supported by the geological values in terms of stratigraphy and palaeontology also provide a basis for the application for criterion (viii) that relates well to the values within recent inscriptions under this criteria, although the geological values would not provide a basis for inscription alone. The selection of components to create the series has been carried out thoroughly and with clear thought regarding the complementarity of the different component parts selected.

4. INTEGRITY

4.1 Protection

The situation in relation to the legal status of the different components of the property is complex. The nomination document lists a very large number and diversity of applicable regulations in each component and province. Four of the components are within a single province; three are on the territory of two provinces with different legal regulations; and two are on the territory of three provinces. Legal protection derives from European, national, and provincial legislation. IUCN requested supplementary information regarding the protection status of the nominated property. In the response the State Party confirms that existing legal protection extends to 99.8% of the nominated property, and to 98% of the area included in buffer zones. One component part of the nominated property is largely within a national park and most of the others are protected as provincial nature parks. Overall, 71% of the nominated area is protected within a national park or provincial nature parks; 94% and 83% are protected as Sites of Community Importance (SCI) or Specially Protected Zones (SPZ), respectively, within the Natura 2000 network of the European Union, under its Habitats (92/43/EEC) and Birds (79/409/EEC) Directives; and 86% are protected by article 142 of the national Code of Cultural Heritage and Landscape, most recently modified in March 2008, which states that, inter alia, areas above 1,600 metres have a special level of protection. The small Rio delle Foglie/Bletterbach component is protected as a natural monument by provincial legislation. The legal complexity is also reflected in different management arrangements for the different components, as discussed below. Very small “unprotected” areas remain within the buffer zones as a result of efforts to link the component parts of the serial property and/or streamline (e.g. simplify) boundaries, and the inclusion of these areas in the nomination is acceptable.

The nomination outlines the land tenure situation for each component within the series. The majority of the nominated property is in public ownership. However, public property, under the definition applied in the nomination, does not mean state-owned property only, but also includes land managed by regional, provincial, and municipal authorities. Therefore, a significant part of the property is under the ownership of municipalities and private owners. This is likely to represent a challenge for future management in relation to both coordination between the different levels involved and also the development and implementation of an effective overall management system.

IUCN considers the protection status of the nominated property meets the requirements set out in the *Operational Guidelines*.

4.2 Boundaries

The boundaries of the nine components of the nominated property and buffer zones are all clearly mapped, and logical. Their boundaries follow, wherever possible, the boundaries of existing protected areas (eight nature parks, one national park and a number of Natura 2000 sites or the 1,600 meter contour). The boundaries exclude infrastructure and intensive-use areas but include a selection of component parts that can be accepted to include all areas that are essential for maintaining the beauty of the property and all or most of the key interrelated and interdependent earth science elements in their natural relationships, as required in the *Operational Guidelines*. The State Party provided in its supplementary information clear explanations, including detailed topographic maps, for a range of minor amendments to the originally submitted boundaries. These were made to correct earlier mapping errors and in response to advice from IUCN on establishing rationalised boundaries, tied to the integrity requirements of the nominated property.

IUCN considers that the boundaries of the nominated property meet the requirements set out in the *Operational Guidelines*.

4.3 Management

A management framework for the whole of the originally nominated series was provided with the original nomination. This provided an impression of the responsibilities of the different park authorities (monitoring, communication, information and promotion). However, common objectives and a strategy for the management of the entire series do not exist, and this document stated that "*the greatest difficulty encountered in proposing a unitary conservation plan lies in the impossibility of harmonising, at least over the short-medium term, the legislative systems of the various Provinces and Regions concerning the safeguarding of nature*". IUCN notes that this difficulty remains a reality, though steps are being taken to address it.

IUCN requested information on the status of the overall management system for the property and the status of site management plans and resources as supplementary information from the State Party. The State Party's response provides a full assessment of the position and the key points of this are as follows.

Overall management system and resources
The State Party in its supplementary information sets out a strategy for ensuring the coordinated management of the nominated serial property. This confirms that an overall management system had not been established at 28th February 2009, and outlines the steps being taken to address this shortcoming of the nomination. It confirms firstly that an institutional arrangement has been prepared via a special Foundation called "Dolomiti – Dolomiten – Dolomitis – Dolomites UNESCO" in which all five provinces involved in the property will participate.

The supplementary information undertakes that this will be established in the event of a positive decision of the Committee for inscription, and outlines the management structure and provides the legal documentation that has already been agreed by all provinces. It is also indicated that a staff resource will be provided and an annual budget of Euro 400,000 per year (with an additional Euro 200,000 in the first year of operation), to be spread between all five provinces. Whilst the effectiveness of such an organisation can only be judged after it becomes operational, IUCN considers that the structure and operation provided for appear to be positive and with a strong potential to be effective.

The nomination also outlines significant progress and plans in relation to the creation of an overall management system. This includes the outputs of a working group that has identified a series of key themes and goals, and details of a planned series of six workshops to further develop thinking during 2009, including a number that will take place between the finalisation of this evaluation report by IUCN and the meeting of the World Heritage Committee in June 2009. Despite this progress, the nomination and supplementary information do not appear to make a firm commitment to the timescale to complete the overall management system. As this is a requirement for inscription the Committee will need to verify the intentions of the State Party in this regard. IUCN considers that it should certainly be feasible to have an overall management plan in place before the 35th Session of the Committee in 2011, if not sooner, based on the evidence of progress provided by the State Party.

Management plans for the different component parts of the nominated property
The situation regarding management planning for the different component parts of the nominated property is also summarised within the supplementary information to the nomination provided by the State Party, following a request from IUCN. This information explains clearly the complex situation concerning the site management plans and indicates that the situation regarding management planning shows considerable achievements, but that not all component parts have management plans. The supplementary information notes that all of the component parts of the property are managed according to the measures set in land plans. Whilst these plans extend some way towards addressing a range of uses, they are in essence regulatory documents and do not include many of the key management activities that would normally be expected within a protected area.

Seven of the nine component parts are covered by a more developed management plan, although coverage is complete in only two component parts, and near complete (>90%) in two more. Three components have partial coverage of management plans between 61-76% of their areas. Two matrices provide information on present and planned actions / fields of action. These also indicate many areas of commonality between the nine components, but also a series of activities that are only in place in some components, but not in others.

The budgets of the different components included in the nomination are considerable; there have been some significant investments in infrastructure, and many people work in these sites, employed by the various authorities, tourist enterprises, refuges, etc. However, the nomination and the supplementary information do not indicate how the staff and resources will be coordinated to provide added value for an eventual World Heritage property.

The IUCN field visit showed that there is considerable support for the nomination from diverse stakeholders (e.g. researchers, communes, museums, tourist operators, operators of refuges, and educational professionals). Detailed information on the processes of stakeholder consultation that took

place in the preparation of the nomination is provided in the supplementary information to the nomination provided by the State Party, following a request from IUCN.

In summary, whilst there is considerable progress, IUCN considers the management of the nominated property does not meet the expectations set out in the *Operational Guidelines* at the present time. This is due to the lack of management plans for some of the nominated component parts, and a lack of an overall management system for the nominated property as a whole. IUCN notes that explicit timescales to provide such plans are not specified within the nomination.

4.4 Threats and human use

The Dolomites are a major tourist destination from within the Alps and beyond. Detailed information on tourist numbers is provided in the nomination document and supplementary information. Tourism pressure and development is a key issue within the nominated property, and a number of well-known locations have been expressly excluded from the nomination because of the existence of tourist infrastructure, especially for skiing. In one component part (Marmolada), there is a cable car and associated ski lifts, and in another component part (Tofane, part of component 5) there is also a cable car, which is closed in winter. IUCN considers that given the scale of the property neither of the cable cars creates an overriding impact on the natural values of the property, and excluding them from the property is not necessary, provided that they remain carefully managed to avoid any additional growth of their impact. According to the State Party, the ski lifts on the Marmolada are expected to be removed in the near future and the affected terrain (which is not vegetated) to be restored.

Existing and future tourism developments within and in particular adjacent to the nominated property, for example in relation to further development of hotels, refuges, shelters and trails, do pose a serious threat despite existing tourism management efforts in some of the component parts. Tourism facilities and activities are at the limits of tolerance for natural World Heritage properties in some the component parts of the property (e.g. Marmolada, component 2 and Tre Cime, part of component 5). They also have significant impacts within the buffer zones of the nominated property. There is a need for more effective planning, management and regulation of tourist facilities and activities, consistent with the carrying capacity of the nominated property.

The overall management system should include an integrated tourism management strategy which ensures that natural values are not compromised by inappropriate tourism development. Reduction in pressure in areas such as those mentioned above requires consideration. In particular, there is a need for effective strategies and measures to manage and minimise tourism impacts within tourist zones, and to protect important natural wilderness-like areas, such as the Dolomiti Friulane, from tourism impacts. Such an integrated tourism management strategy should also address and develop effective strategies and measures for the management of specific activities, such as climbing. This strategy should both take account of the nominated property and its buffer zones, as well as of the wider region in order to be effective. It will not be possible to devise an effective tourism strategy by focussing on the nominated property alone. The supplementary information provided by the State Party includes information on visitation as a precursor to the creation of this strategy, and also indicates that a key role of the new foundation will be to consider these issues as a priority.

Public roads have been excluded from the nominated series wherever possible, including in response to advice from IUCN following its field visits. Roads not open to the public can be found in many areas within the series. In forested areas, these roads are in use for forestry activities and also hunting (hunting is prohibited in all parks in all provinces except for Bolzano). Several roads are also found in high mountain areas above the treeline. These roads remain from World War I and are now used to supply and service refuges and shelters.

Limited forest exploitation (sanitary cuttings) is permitted in forests within the nominated property. The intensity of these forestry activities is low and commonly limited individual trees. However, no legal prohibition of clear cuttings exists. Summer pasture activities are found within the nominated property as well. While cattle are limited to the few fertile grazing grounds, sheep are found in many places within the nominated property.

In conclusion, IUCN considers that the nominated property does not fully meet the conditions of integrity, as the provision for the effective management of the property is not yet fully satisfactory. The key missing elements are an established overall management system for the property as a whole, missing management plans for two component parts, and a lack of complete coverage of management plans in a number of the other component parts. There is currently no timescale established by the State Party to put these plans in place.

5. ADDITIONAL COMMENTS

5.1 Justification for serial approach

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

a) What is the justification for the serial approach?

A serial approach is justified in relation to the nomination of the Dolomites in order to bring together key areas that together represent the most significant natural values of the mountain range as a whole.

b) Are the separate component parts of the nominated property functionally linked in relation to the requirements of the *Operational Guidelines*?

The nine component parts proposed in the current nomination are functionally linked in the sense of representing complementary natural values of the Dolomites. This relates to the range of landscape and geomorphological values, and the representation of the continuous geological succession of the region. This corresponds well to the expectations of the *Operational Guidelines* in relation to the relevant criteria.

c) Is there an overall management framework for all the component parts of the nominated property?

There is not yet an overall management framework for the property. Detailed discussion of this is provided in section 4.3.

6. APPLICATION OF CRITERIA

This serial property has been nominated under two natural criteria: (vii) and (viii).

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

The Dolomites are widely regarded as being among the most attractive mountain landscapes in the world. Their intrinsic beauty derives from a variety of spectacular vertical forms such as pinnacles, spires and towers, with contrasting horizontal surfaces including ledges, crags and plateaux, all of which rise abruptly above extensive talus deposits and more gentle foothills. A great diversity of colours is provided by the contrasts between the bare pale-coloured rock surfaces and the forests and meadows below. The mountains rise as peaks with intervening ravines, in some places standing isolated but in others forming sweeping panoramas. Some of the rock cliffs here rise more than 1,500 m and are among the highest limestone walls found anywhere in the world. The distinctive scenery of the Dolomites has become the archetype of a "dolomitic landscape". Geologist pioneers were the first to be captured by the beauty of the mountains, and their writing and subsequent painting and photography further underline the aesthetic appeal of the property.

IUCN considers that the nominated property meets this criterion.

Criterion (viii): Earth's history, geological and geomorphic features and processes

The Dolomites are of international significance for geomorphology, as the classic site for the development of mountains in dolomitic limestone. The area presents a wide range of landforms related to erosion, tectonism and glaciation. The quantity and concentration of extremely varied limestone formations is extraordinary in a global context, including peaks, towers, pinnacles and some of the highest vertical rock walls in the world. The geological values are also of international significance, notably the evidence of Mesozoic carbonate platforms, or "fossilized atolls", particularly in terms of the evidence they provide of the evolution of the bio-constructors after the Permian/Triassic boundary, and the preservation of the relationships between the reefs they constructed and their surrounding basins. The Dolomites also include several internationally important type sections for the stratigraphy of the Triassic Period. The scientific values of the property are also supported by the evidence of a long history of study and recognition at the international level. Taken together, the combination of geomorphological and geological values creates a property of global significance.

IUCN considers that the nominated property meets this criterion.

IUCN considers that protection status and boundaries of the nominated property do not fully meet the conditions of integrity; as the requirements for management are not met due to the current lack of an overall management system for the nominated property. There is also currently a lack of site management plans within some of the component parts of the property. Although there can be significant optimism regarding the potential to address these needs, the lack of these plans is clearly a concern at the present time.

IUCN notes that in similar circumstances it has been the recent practice of the World Heritage Committee to inscribe properties on the World Heritage List, with a request for the State Party to complete the required management plans within a given timescale. In the case of the Dolomites, IUCN considers that a timescale of at least 18 months would be required to put in place the necessary plans. Thus, if the Committee wishes to inscribe the property at this stage, IUCN recommends that it adopts the recommendation below, but that it first confirm that the State Party is in agreement to a clear programme and timescale to

establish the necessary overall management of the nominated property (as specified in paragraph 4 of the draft decision). This would ensure that the decision is fully in line with paragraph 115 of the *Operational Guidelines*, and would also recognise that there is a significant process already underway to establish the required overall management system. IUCN also recommends that the Committee may wish to consider the alternative strategy to refer the property back to the State Party to allow these plans to be put in place prior to inscription.

7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopt the following draft decision:

The World Heritage Committee,

1. Having examined Documents WHC-09/33.COM/8B and WHC-09/33.COM/INF.8B2,

2. Inscribes **The Dolomites, Italy,** on the World Heritage List on the basis of natural criteria **(vii) and (viii)**;

3. Adopts the following **Statement of Outstanding Universal Value**:

Brief synthesis

The nine components of The Dolomites World Heritage Property protect a series of highly distinctive mountain landscapes that are of exceptional natural beauty. Their dramatic vertical and pale coloured peaks in a variety of distinctive sculptural forms is extraordinary in a global context. This property also contains an internationally important combination of earth science values. The quantity and concentration of highly varied limestone formations is extraordinary in a global context, whilst the superbly exposed geology provides an insight into the recovery of marine life in the Triassic period, after the greatest extinction event recorded in the history of life on Earth. The sublime, monumental and colourful landscapes of the Dolomites have also long attracted hosts of travellers and a history of scientific and artistic interpretations of its values.

Criteria

Criterion (vii): *The Dolomites are widely regarded as being among the most attractive mountain landscapes in the world. Their intrinsic beauty derives from a variety of spectacular vertical forms such as pinnacles, spires and towers, with contrasting horizontal surfaces including ledges, crags and plateaux, all of which rise abruptly above extensive talus deposits and more gentle foothills. A great diversity of colours is provided by the contrasts between the bare pale-coloured rock surfaces and the forests and meadows below. The mountains rise as peaks with intervening ravines, in some places standing isolated but in others forming sweeping panoramas. Some of the rock cliffs here rise more than 1,500 m and are among the highest limestone walls found anywhere in the world. The distinctive scenery of the Dolomites has become the archetype of a "dolomitic landscape". Geologist pioneers were the first to be captured by the beauty of the mountains, and their writing and subsequent painting and photography further underline the aesthetic appeal of the property.*

Criterion (viii): *The Dolomites are of international significance for geomorphology, as the classic site for the development of mountains in dolomitic limestone. The area presents a wide range of landforms related to erosion, tectonism and glaciation. The quantity and concentration of extremely varied limestone formations is extraordinary in a global context, including peaks, towers, pinnacles and some of the highest vertical rock walls in the world. The geological values are also of international significance, notably the evidence of Mesozoic carbonate platforms, or "fossilized atolls", particularly in terms of the evidence they provide of the evolution of the bio-constructors after the Permian/Triassic boundary, and the preservation of the relationships between the reefs they constructed and their surrounding basins. The Dolomites also include several internationally important type sections for the stratigraphy of the Triassic Period. The scientific values of the property are also supported by the evidence of a long history of study and recognition at the international level. Taken together, the combination of geomorphological and geological values creates a property of global significance.*

Integrity

The nine component parts that make up the property include all areas that are essential for maintaining the beauty of the property and all or most of the key interrelated and interdependent earth science elements in their natural relationships. The property comprises parts of a national park, several provincial nature parks and Natura 2000 sites, and a natural monument. Buffer zones have been defined for each component part to help to protect from threats from outside

its boundaries. The natural landscapes and processes that are essential to maintaining the property's values and integrity are in a good state of conservation and largely unaffected by development.

Management and protection requirements

As a serial property, the Dolomites require an adequately resourced, inter-provincial governance arrangement that ensures all five provinces with territory in the property are bound together within a common management system, and with an agreed joint management strategy and a monitoring and reporting framework for the property as a whole. Common policies and programmes for the management of public use and the presentation of the property are also required for the property and its buffer zones. The property requires protection from tourism pressures and related infrastructure.

Each of the component parts of the serial property requires its own individual management plan, providing not only for the protection and management of land use, but also the regulation and management of human activities to maintain its values, and in particular to preserve the qualities of its natural landscapes and processes, including extensive areas which still have wilderness character. Areas that are subject to more intensive visitation need to be managed to ensure visitor numbers and activities are within the capacity of the property in relation to the protection of both its values and the experience of visitors to the property. Adequate resources and staffing, and coordination between the staff teams in the different components of the property are also essential.

4. Notes that the decision to inscribe the property is made on the understanding that the State Party is in agreement with the following requests of the Committee, which should be implemented prior to the 35th session of the Committee in 2011 in order to address fully the requirements of the *Operational Guidelines*:

   a) That the anticipated inter-provincial foundation: "Dolomiti – Dolomiten – Dolomitis – Dolomites UNESCO" is established following the inscription of the property and provided with the budget indicated by the State Party.

   b) That an action-oriented overall management strategy for the whole of the serial property is developed, in consultation with the full range of relevant stakeholders, to establish (i) governance arrangements for the effective management of the property; (ii) operational management actions, in relation to key themes specific to the nominated World Heritage property and the criteria for which it is inscribed; (iii) monitoring and reporting on the State of Conservation of the property as a whole and the management effectiveness of the property and (iv) practical options to achieve the financial sustainability for conserving and managing the property.

   c) That individual management plans for each one of the component parts of the serial property are completed to ensure consistent and effective delivery of the overall framework, as well as effective local management of conservation and use appropriate to the component part in question.

   d) That a comprehensive strategy is developed for tourism and visitor use covering the property, its buffer zones and considering appropriate links to the wider region, in order to fully consider the requirements for maintaining the Outstanding Universal Value and conditions of integrity of the property under the scenario of expected increase in visitation after the inscription. This strategy should aim to manage visitor levels in areas already at or over capacity, to prohibit intensification of infrastructure or inappropriate uses that could impact the values of the property, and to ensure effective presentation and tourism benefits compatible with the long-term conservation of the property.

5. Commends the State Party for the considerable efforts in implementing previous recommendations regarding the establishment of an appropriate serial property and for the measures taken to establish overall management arrangements for the property, and also takes note of the presentation of the different component parts in relation to the values of the property as a whole as an example of good practice;

6. Requests the State Party to invite a mission to the property in 2011 to assess progress with the implementation of the overall management framework and governance for the property, the establishment of management plans for the different component parts of the property, and the establishment of a tourism strategy, in order to allow the World Heritage Committee to assess the progress that has been made in relation to its requests noted above.

Map 1: General location of nominated property

Map 2: Boundaries of nominated property

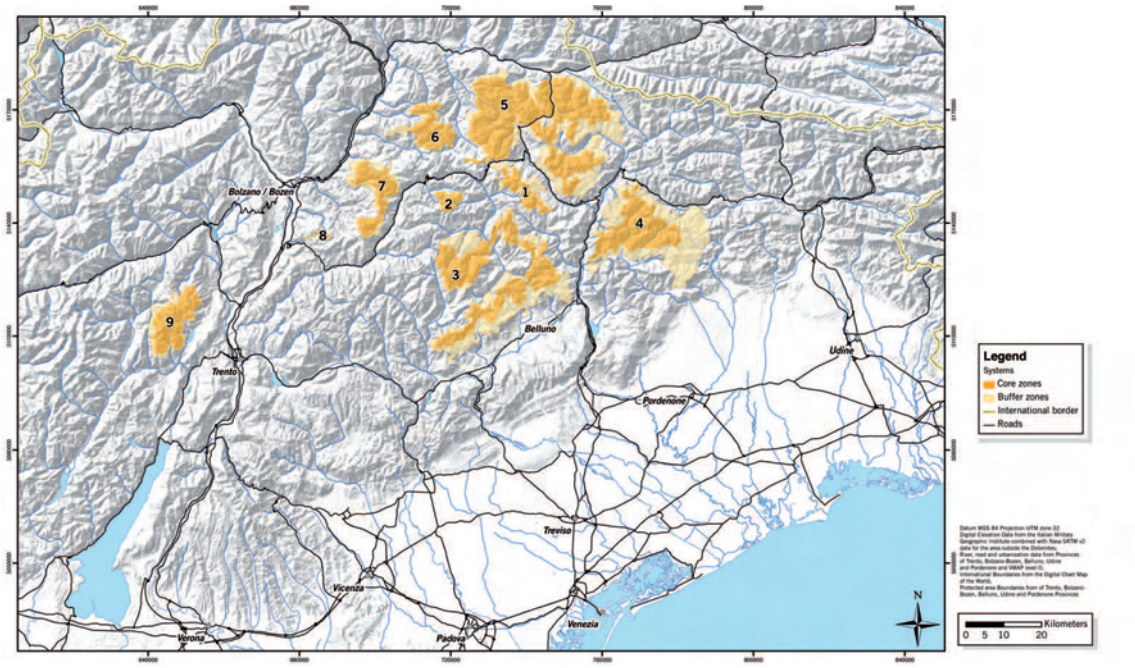
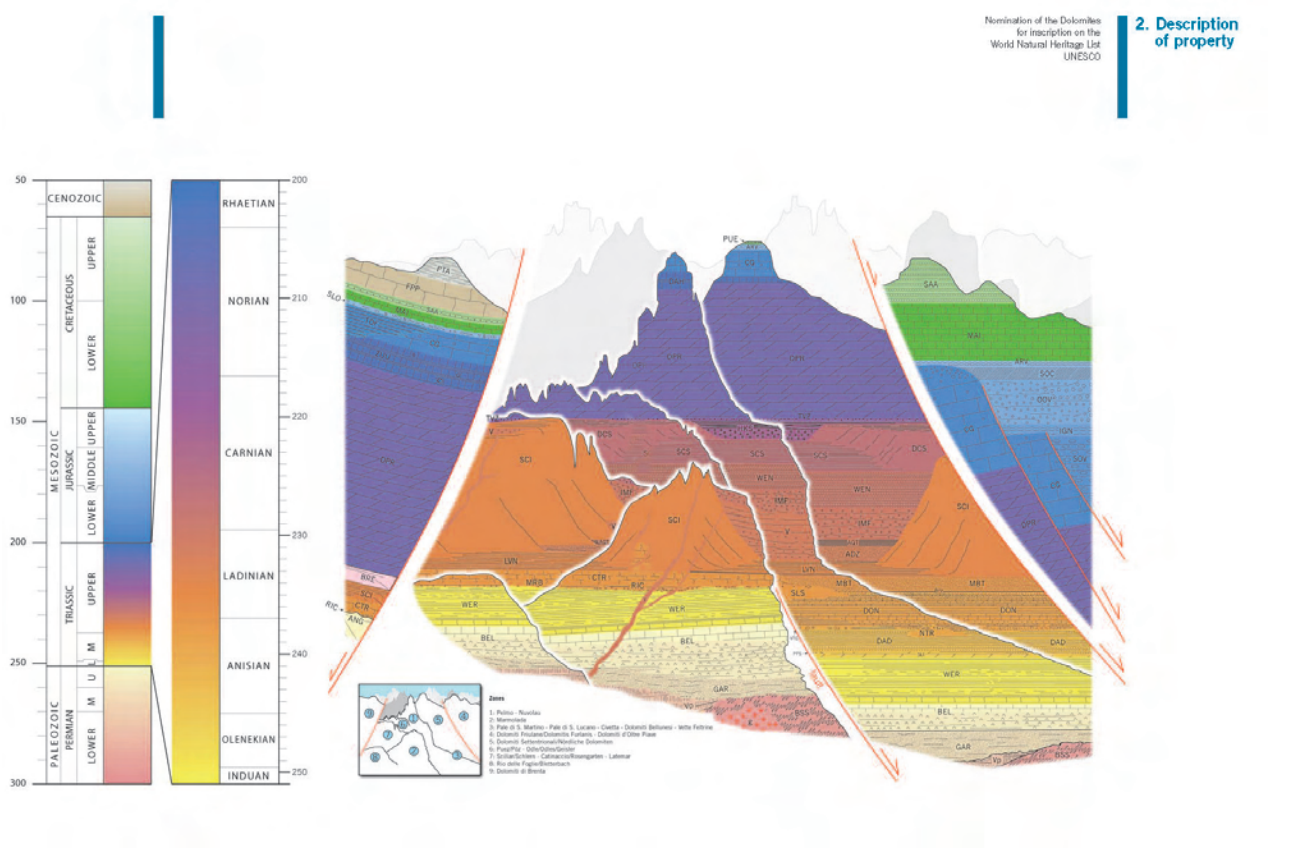


Diagram 1: Diagram showing relationship of the component parts of the property



A3 Extensions of Natural Properties

Asia / Pacific

Tubbataha Reefs Natural Park
(as an extension of the Tubbataha Reef Marine Park)

Philippines

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

TUBBATAHA REEFS NATURAL PARK (PHILIPPINES) ID No. 653 bis

Background note:

At the time of the inscription of Tubbataha Reef Marine Park in 1993, IUCN recommended that two nearby islets with important reefs (Jessie Beazley Reef and Bastera Reef) be included in a future extension of the property. This recommendation was repeated in the state of conservation report on the property presented at the 28th Session of the World Heritage Committee in 2005. In August 2006, the State Party extended the National Marine Park to include Jessie Beazley Reef and renamed it the Tubbataha Reefs Natural Park (TRNP). The park's area was increased from 33,200 ha to 96,828 ha. The new boundaries and legal protection do not include Bastera Reef which lies in a different municipality and at a greater distance from both Tubbataha north and south atolls and Jessie Beazley Reef. The present nomination is for an extension to the World Heritage property to the same boundaries as that of the TRNP.

1. DOCUMENTATION

i) Date nomination received by IUCN: 15 March 2008.

ii) Additional information officially requested from and provided by the State Party: IUCN requested supplementary information after the first meeting of the World Heritage Panel in December 2008 related to a number of points concerning the management capacity and budget for the property. The State Party provide a response to IUCN on these points on 30th January 2009.

iii) IUCN/WCMC Data Sheet: Sourced from nomination document which cites 22 references.

iv) Additional Literature Consulted: White, A. T. and Vogt, H. P. (2000) **Marine Pollution Bulletin.** Volume 40, Issue 6, 537-550; Vallejo, B (2001) **The Biogeography of Philippine marine molluscs.** Loyola Schools Review 1: 58-77. White; A.T., Salamanca, A. and Courtney, C.A. (2002). **Experience with Marine Protected Area Planning and Management in the Philippines.** Coastal Management 30:1-26; Tongson, E. and Dygico, M (2004) **User Fee System for Marine Ecotourism: The Tubbataha Reef Experience.** Coastal Management, 32:17–23; Dygico, M. (2006). **Tubbataha Reefs: A Marine Protected Area that works. A Case Study on the Philippines.** WWF- Philippines. **Philippine Coral Reefs Under Threat: Lessons Learned After 25 Years of Community-Based Reef Conservation**.White, A. T., Gomez, E., Alcala, A. C., Russ, G. (2007). **Evolution and Lessons from Fisheries and Coastal Management in the Philippines.** Fisheries Management. 88-111; White A.T., Ovenden, M. (undated) **Tubbataha Reef National Marine Park in Palawan.** Available at http://www.oneocean.org/; Tubbataha Management Office (2008) Tubbataha Reefs Natural Park Business Plan. 7th Draft; Campos, W. and Belida, P. (2008) **Ichthyoplankton Assemblages in Atolls Along Cagayan Ridge, Sulu. Sea, Philippines.** 11th International Coral Reef Symposium; **Ramsar Information Sheet: Tubbataha Reefs Natural Park.** www.ramsar.org/ris/key_ris_index.htm.

v) Consultations: 3 external reviewers. Extensive consultations were undertaken during the field visit including with the Tubbataha Protected Area Management Board, and its members including Tubbataha Management Office, Local Government Unit of Cagayancillo, Palawan Coast Guard, and local community representatives. Meetings were held with Governor of Palawan, UNESCO National Commission, Department of Tourism, site management staff, NGO partners and tourism operators.

vi) Field Visit: Jamili Nais and Josephine Langley, October 2008.

vii) Date of IUCN approval of this report: 27 April 2009.

2. SUMMARY OF NATURAL VALUES

Tubbataha Reefs Natural Park (TRNP) is located in the Province of Palawan (municipality of Cagayancillo). The nomination put forward is for an extension to the existing Tubbataha Reef Marine Park World Heritage property to include Jessie Beazley Reef and would be a threefold increase in the area of the property to 96,828 ha. The nomination would coincide with the boundaries of the TRNP.

The nominated property is situated midway along the 120km Cagayan Ridge, which runs across the Sulu Sea and has an average depth of some 750 m. The extended property would include areas of open sea reaching depths of more than 2000m. In a few localities, seamounts reach the surface and provide a platform for the development of coral atolls that are the visible features of the nominated property. The TRNP consists of three reef areas: North and South Atoll, 8 km apart, and the smaller Jessie Beazley Reef, 20 km to the north of these. The North Atoll is an oblong platform 16 km long by 4.5 km wide, with Bird Islet, a 0.3 ha coralline sand cay. The South Atoll is a small triangular-shaped reef about 5 km long by 3 km wide with the South Islet, a coralline sand cay of about 0.08 ha, at its southern tip. Both islets are lightly vegetated and provide nesting sites for seabirds and marine turtles. Jessie Beazley Reef is 5 km long by 3 km wide. A cay is evident even at high tide and provides a bird roosting site and the area has extensive reef flats. The seaward reef edge drops to 100 m below sea level with often perpendicular 40-50m walls of coral-hung crevices, overhangs, ledges and caverns.

Research since the inscription of the property on the World Heritage List has increased the understanding of its natural values, and these are documented in the nomination dossier. An increased number of species has been identified and the conservation status of many species has changed. The two atolls within the existing property include 374 identified species of corals (65 threatened), 479 species of fish (7 threatened), 11 species of shark (4 threatened), 2 species of turtle (both threatened), 99 species of seabirds, including the threatened Christmas Island Frigate, 11 species of cetaceans (4 species threatened and all listed under CITES). Large schools of pelagic fish such as species of barracuda, jack, tuna, black-tip sharks and whale sharks are common in the open waters of the nominated property. The area is also reported to have the world's highest densities of whitetip reef sharks.

Jessie Beazley Reef has a higher proportion of soft corals compared to the other two atolls suggesting a more exposed reef. Spotted dolphin occur in the waters around Jessie Beazley Reef and had not previously been identified in the property. In 2004, the recorded fish biomass of Jessie Beazley Reef was found to be significantly lower than in the other two Tubbataha atolls (126.25 mt/sq.km compared to 166.51 mt/sq.km). The difference was even more significant when commercially caught fish species were compared. This can be explained by the fact that commercial fishing continued on Jessie Beazley reef until 2006. Another possibility is this reef may have been less resilient to a coral bleaching event in 1998.

The Tubbataha area is a major nursery for fish and decapod larvae and, via the monsoon-driven currents, important to their dispersal in the fisheries of Palawan and other islands of the Sulu Sea. The two islets have five species of trees and four species of grass. The marine flora is much more diverse with its 45 species of benthic macroalgae and extensive seagrass beds on the shallower parts of the reef and lagoon.

3. COMPARISONS WITH OTHER AREAS

The nomination of 1993 emphasized a number of points in its comparative analysis. These included:

- Virtually the entire coastline of the Philippines is dotted with coral reefs. The largest concentration and most diverse reefs are near Palawan and its satellite islands where Tubbataha is found. In addition to Tubbataha, the important marine reserves in the country are found at Hundred Islands, Santa Cruz Islands, Sumilan, Turtle Island, and El Nido.
- Because of its remoteness and due to management activities, Tubbataha was considered the most intact and diverse of all the marine reserves in the Philippines, and the best documented example. Many other reefs in the region were poorly known and it was noted that there may be others that eventually prove as important (e.g. those found around the Spratly Islands).
- Marine parks with equal diversity and abundance of fishes were noted at Bunaken Marine Park in northern Indonesia, possibly, Cenderwasih in Irian Jaya and certainly the Pulau Seribu marine park off Java. Another strong World Heritage marine park prospect noted in the region is Palau's Ngerukewid Islands Wildlife Preserve. Comparing Tubbataha reefs with those of French Polynesia, the former has 46 genera of hard corals in 332 sq km of ocean while the latter have 51 genera in 2.5 million sq km of ocean. Tubbataha thus was considered to have a very concentrated diversity within the Coral Triangle centre of global marine biodiversity.
- The existing Great Barrier Reef World Heritage property was noted as significantly larger than Tubbataha. However, the Great Barrier Reef

encompasses an entire coastal multiple use area of 3.5 million sq km, of which 30% is closed to fisheries. Despite this difference in size, the condition of the reefs at Tubbataha was considered comparable.

- The 1993 comparison noted that: *"given the extent of reef degradation in the Philippines and generally throughout the Asian region, the reefs at Tubbataha stand out as one of the best intact marine sites and thus their presence is of particular importance. This conclusion is reflected in the attraction that the area has become for Scuba divers who rate the reefs at Tubbataha as one of the world's top diving destinations."*

A significant number of new marine protected areas have been established and researched in greater depth since TRNP was inscribed on the World Heritage List, and the basis for a comparative analysis for a new inscription would be different than that which is applied to the extension of an existing site. There are equally important and more outstanding marine protected areas within the Coral Triangle area. Nevertheless, the TRNP retains a distinctive importance and has a rich and diverse marine life and lies at the heart of the Coral Triangle, the epicentre of the world's coral richness and diversity. The property is located within the Sulu-Sulawesi Marine Ecoregion, an area designated as a priority area for marine seascape conservation. It is also one of the few marine World Heritage properties which protects deep sea areas from fishing. The extended area of TRNP both brings new values not represented within the existing property, and brings a greater area of conservation value into the property. It thus strengthens the integrity of the property.

4. INTEGRITY

4.1. Protection

The Tubbataha Reef National Marine Park was established in 1988 under Presidential Decree No. 705, Proclamation No. 306. In 2006, the park was extended to an area of 96,828 ha to encompass the Jessie Beazley Reef by Presidential Proclamation 1126 and the park was renamed the Tubbataha Reefs Natural Park (TRNP). The property is classified as an IUCN Management Category II protected area as a National Park. TRNP operates as a 'no-take' protected area as provided for in the original decree of 1988, as well as the subsequent decree extending the park in 2006. TRNP is also protected by a range of other laws, and additional measures are currently under consideration to extend wider protection to the property through a buffer zone that is under discussion at the national level, and the early stages of consideration of the possible creation of an internationally recognised Particularly Sensitive Sea Area (PSSA). The property would benefit from such measures to both reduce the potential impact of the very heavy shipping traffic in the Sulu sea and the oil and gas concessions that are located in the area surrounding property.

IUCN considers the protection status of the nominated property meets the requirements set out in the *Operational Guidelines.*

4.2 Boundaries

The boundaries of the nominated extended property allow for protection of the Jessie Beazley Reef together with the open sea areas between this reef and the existing inscribed property. These open sea areas provide sanctuary for pelagic species such as whales, dolphins, manta rays and seabirds among others. Although not noted as part of the nomination, IUCN understands that there is a proposal to establish a buffer zone up to 10 nautical miles wide adjoining the current park boundary. This has not at present been passed by the Philippines Congress. Depending on the policies adopted within it, the buffer zone would be important to help reduce the risk from shipping associated threats of ship strikes, pollution and the impacts of adjacent fishing activities.

There is no other reef near enough to TRNP that could feasibly be included within extended boundaries of the property at the present time. Bastera Reef was also recommended for extension at the time of inscription in 1993 but is not suitable for inclusion at this stage due to a variety of reasons including lack of political support and lack of protection. Also, due to the 50 nautical mile separation from the nominated property, the associated costs of management and patrolling are not currently feasible. Currently, separate efforts are underway to accord some form of protection to the Bastera Reef, and thus it might be possible for Bastera to eventually be a component in a future serial extension.

IUCN considers that the boundaries of the nominated extended property meet the requirements set out in the *Operational Guidelines*.

4.3 Management

The management of TRNP has evolved since it was first declared a protected area in 1988, and its inclusion on the World Heritage List in 1993. Despite continuing pressures, it is a relatively effectively protected coral reefs for its size in the region. The management regime is focused on strict protection, and delivered through a management consortium consisting of the Philippine central, provincial and municipal level of government, NGOs and some private sector donors.

Administratively, TRNP falls under the jurisdiction

of the Provincial Government of Palawan. In 1999, the Palawan Council for Sustainable Development established the Tubbataha Protected Area Management Board (TPAMB). The TPAMB replaced the Presidential Task Force as the managing authority of the TRNP (although the membership of the authority remained similar). The 2006 decree further established the TPAMB as the sole policy making and permit-granting body for the TRNP.

A Management Plan was approved in 1999 and updated in 2002, 2004 and 2007. The principal goals of the management plan include protection and management, survey and investigation, community development - focusing on the municipality of Cagayancillo. The management plan is adequate at the present time, although it is relatively brief and generalised and therefore represents a minimum level of planning. It does not address in detail the specific needs for the area included in the 2006 extension of the Natural Park. The plan also does not consider buffer zone policies at present, nor the management response to the wider threats to the property, through the development of risk management strategies or response strategies to the impacts of climate change.

The management operations of the TRNP are carried out by the Tubbataha Management Office (TMO) based in Puerto Princesa. The TMO consists of the Park Manager, assisted by two park rangers, a finance and administrative officer, an administrative assistant and two research assistants. The office facilities are insufficient for this team. Six to eight on-site rangers are based at a ranger station on the North Atoll, and include specially trained personnel of the Philippines Navy and Coastguard. The on-site operations are heavily reliant on the personnel and logistic support from the Navy and Coastguard.

There is a need to continue to enhance management capacity to effectively protect TRNP. The nominated extension almost triples the size of the property and includes mostly open seas. This larger area requires additional resources for adequate protection. At the time of the IUCN mission, the extended area could only be visited by patrol boats twice a week due to the fuel consumption and risk of engine and radio failure. IUCN requested supplementary information regarding identified shortfalls in the provision of boats, motors and staff following its evaluation mission. The State Party response confirms that the Department of Tourism has contributed two additional outboard engines, Conservation International is providing a new boat with an engine, and that funds were set aside for engine replacement. In relation to staffing, the supplementary information confirms that the Province of Cagayancillo has assigned its personnel to augment the law enforcement ranks. The capacity of rangers and other staff to support prosecutions should be further developed. A clear security protocol and line of communication in any eventuality should be established, which should be understood by every member of the staff, on-site as well as at the TMO office at Puerto Princesa.

The estimated budget required for full implementation of the TRNP Management Plan is estimated in the nomination as requiring a minimum of USD 293,000 p.a. IUCN requested supplementary information regarding the provision of adequate resources for the management of the property, and noting that the budget has recently been in deficit. In its response the State Party reports that the Provincial Government of Palawan has agreed to provide funding of PHP4million (USD 83,000) annually towards the management costs of the property, and that work is underway to institutionalise this budget agreement. This increase is welcome, and if sustained provides a good basis to further enhance the budget for the management of the property. Nevertheless the financial situation of TRNP remains stretched and IUCN considers that further support from the State Party, and potentially from the international community is required.

Areas where further additional funding may be required include the provision of effective surveillance of the property, improved legal enforcement, awareness raising with local communities on alternative livelihoods to illegal fishing and management of tourism growth.

IUCN considers the management of the nominated property meets the requirements set out in the *Operational Guidelines.*

4.4 Threats

Key threats identified for TRNP include the following:

4.4.1 Illegal and destructive fishing

TRNP sits in the middle of the Sulu Sea and is vulnerable to local and foreign illegal fishers. In the period March 2006 to December 2008, site management carried out 38 arrests involving 314 fishers.

Most illegal fishers are Philippine nationals and many target the top shell 'trochus' for the international market. There is a need to allocate more funding to education of benefits of the property and awareness to prevent illegal fishing. Fish aggregating devices outside the property are also a threat, and are set to attract fish to leave the reserve. Preventing this could be a specific requirement of a buffer zone for the property.

Illegal fishing from international vessels is potentially more serious than from local fishers. Prosecution is also more difficult because of reported diplomatic pressure on politicians and the judiciary. Illegal

fishers have been apprehended in Tubbataha from China and Viet Nam. In January 2007, 30 Chinese poachers were apprehended with endangered species of Napolen wrasse, red snapper and grouper on board.

While the high fish biomass, coral cover, and high density of sharks and high trophic level fish demonstrate the health of the north and south atolls in Tubbataha, the impact of decades of destructive fisheries is more evident in Jessie Beazley Reef where fishing only became illegal in 2006 and impacts of illegal fishing activities are still seen. There are good prospects for the continued recovery of Jessie Beazley Reef, which would be supported by its recognition as an extension of the existing World Heritage property.

4.4.2 Tourism
Tourism generates 70% of the park revenue and offers potential alternative livelihoods for local communities. Currently, damage by tourists is considered insignificant compared to illegal and destructive fishing. There are plans in the business plan of TRNP to significantly increase visitation to the property. These should be implemented with careful consideration of capacity, zoning and/or rotation to give 'rest' periods to sections of the reef. Areas should be maintained with limited access except for research divers. Potential damage from anchors, pollution, and diver-induced damage should be properly addressed and mitigated, and visitor safety arrangements also need careful planning. Mooring areas need to be maintained and improved.

4.4.3 Shipping
Shipping poses a threat to the property, as evidenced by the fact that two ships have been grounded in recent years. The potential to better regulate shipping in the area surrounding the property is discussed above. In terms of operational work the relevant maritime agencies in the Philippines should be encouraged to better distribute current charts with location of reef structures and property boundaries together with proposed buffer zone. Enhanced oil and hazardous waste spill response plans, and collaborative emergency response procedures are also required.

4.4.4 Energy exploration
Oil exploration and exploitation in the Sulu Sea is a threat to the Park. Seismic surveys associated with petroleum exploration have the potential to cause localised disruption to marine mammals and should be carefully planned, assessed and monitored. Any exploration or exploitation of mines in the region surrounding the property should be subject to an Environmental Impact Assessment carried out to international standards of best practice, and should assess potential impact on the Outstanding Universal Value and integrity of the property. An oil exploration concession previously included a portion of the nominated extended property but has been surrendered.

4.4.5 Pollution
In addition to pollution risk from shipping and tourism vessels, plastic waste is evident on the reef flats, cays and has been observed in birds nests. It is a known threat to wildlife. Although it is unclear if these plastics are from passing vessels or pollution from land-based sources, the State Party is encouraged to increase its efforts to improve solid waste management of plastics in particular due to the negative impact on wildlife and the food chain.

4.4.6 Climate and environmental change
Climate change poses a threat to the property in relation to possible sea surface temperature increases, erosion of sand cays, and potential acidification of the Sulu Sea. In 1998, approximately 20% of the living coral in Tubbataha was killed in a bleaching event linked to the El Niño event of that year. While the coral cover has fully recovered, indicating a resilient and healthy ecosystem, there is a need to continue to closely monitor reef health and water quality including acidity in particular. It will be important to monitor the status of the cays in Tubbataha and the impact on nesting bird populations.

A further area of concern regarding change relates to the vulnerability of seabirds. The whole Sulu Sea has some 37 small islands but the seabirds are able to breed freely in only three of them without the presence of humans, cats, dogs, rats, etc. Of the three uninhabited islands, two are within the TRNP. The cay on Bird islet of North Atoll is eroding, whilst that on Jessie Beazley reef is accreting. While such dynamism of cays is natural, it is important to note the risk to the highly vulnerable sea birds in this region and potential acceleration due to increased sea level/storm frequency which could occur in relation to climate change.

In summary, IUCN considers the nominated property meets the conditions of integrity as outlined in the *Operational Guidelines*. There are nevertheless many significant management challenges.

5. ADDITIONAL COMMENTS

None.

6. APPLICATION OF CRITERIA

Tubbataha Reef Marine Park (the current name of the nominated property) was inscribed in 1993 under natural criteria (vii), (ix) and (x). The extension of the property is nominated under the same three criteria.

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

Tubbataha Reefs Natural Park contains excellent examples of pristine reefs with a high diversity of marine life. The property includes extensive reef flats and perpendicular walls reaching over 100m depth, as well as large areas of deep sea. The remote and undisturbed character of the property and the continued presence of large marine fauna such as tiger sharks, cetaceans and turtles, and big schools of pelagic fishes such as barracuda and trevallies add to the aesthetic qualities of the property.

IUCN considers that the nominated property meets this criterion.

Criterion (ix) Ecological processes

Tubbataha Reefs Natural Park lies in a unique position in the middle of the Sulu Sea and is one of the Philippines oldest ecosystems. It plays a key role in the process of reproduction, dispersal and colonization by marine organisms in the whole Sulu Sea system, and helps support fisheries outside its boundaries. The property is a natural laboratory for the study of ecological and biological processes, displaying the ongoing process of coral reef formation, and supporting a large number of marine species dependant on reef ecosystems. The tiger and hammerhead sharks, are indicators of the ecological balance of the property. The property also offers a demonstration site to study the responses of a natural reef system in relation to the impacts of climate change.

IUCN considers that the nominated property meets this criterion

Criterion (x) Biodiversity and threatened species

Tubbataha Reefs Natural Park provides an important habitat for internationally threatened and endangered marine species. The property is located within the Coral Triangle, a global focus for coral biological diversity. The reefs of the property support 374 species of corals, almost 90% of all coral species in the Philippines. The reefs and seas of the property also support eleven species of cetaceans, eleven species of sharks, and an estimated 479 species of fish, including the iconic and threatened Napoleon wrasse. The property supports the highest population densities known in the world for white tip reef sharks. Pelagic species such as jacks, tuna, barracuda, manta rays, whale sharks and different species of sharks also are common here and the property is a very important nesting, resting and juvenile development area for two species of endangered marine turtles: green turtles and hawksbill turtles. There are seven breeding species of seabirds, and Bird Islet and South Islet are breeding grounds for seven resident and endangered species of seabirds. The critically endangered Christmas Island Frigatebird is a regular visitor to the property.

IUCN considers that the nominated property meets this criterion

7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopt the following draft decision:

The World Heritage Committee,

1. Having examined Documents WHC-09/33.COM/8B, WHC-09/33.COM/INF.8B.INF, and WHC-09/33.COM/7B,

2. Approves the extension of the **Tubbataha Reef Marine Park, Philippines**, inscribed under natural criteria **(vii), (ix)** and **(x)**, and takes note of the consequent revised name of the extended property, **Tubbataha Reefs Natural Park**, which replaces the previous name;

3. Adopts the following **Statement of Outstanding Universal Value**:

Brief Synthesis

Tubbataha Reefs Natural Park lies in a unique position in the centre of the Sulu Sea, and includes the Tubbataha and Jessie Beazley Reefs. It protects an area of almost 100,000 ha of high quality marine habitats containing three atolls and a large area of deep sea. The property is home to a great diversity of marine life. Whales, dolphins, sharks, turtles and Napoleon wrasse are amongst the key species found here. The reef ecosystems support over 350 species of coral and almost 500 species of fish. The reserve also protects one of the few remaining colonies of breeding seabirds in the region.

Criteria

Criterion (vii): *Tubbataha Reefs Natural Park contains excellent examples of pristine reefs with a high diversity of marine life. The property includes extensive reef flats and perpendicular walls reaching over 100m depth, as well as large areas of deep sea. The remote and undisturbed character of the property and the continued presence of large marine fauna such as tiger sharks, cetaceans and turtles, and big schools of pelagic fishes such as barracuda and trevallies add to the aesthetic qualities of the property.*

Criterion (ix): *Tubbataha Reefs Natural Park lies in a unique position in the middle of the Sulu Sea and is one of the Philippines' oldest ecosystems. It plays a key role in the process of reproduction, dispersal and colonization by marine organisms in the whole Sulu Sea system, and helps support fisheries outside its boundaries. The property is a natural laboratory for the study of ecological and biological processes, displaying the ongoing process of coral reef formation, and supporting a large number of marine species dependant on reef ecosystems. The presence of top predator species, such as tiger and hammerhead sharks, are indicators of the ecological balance of the property. The property also offers a demonstration site to study the responses of a natural reef system in relation to the impacts of climate change.*

Criterion (x): *Tubbataha Reefs Natural Park provides an important habitat for internationally threatened and endangered marine species. The property is located within the Coral Triangle, a global focus for coral biological diversity. The reefs of the property support 374 species of corals, almost 90% of all coral species in the Philippines. The reefs and seas of the property also support eleven species of cetaceans, eleven species of sharks, and an estimated 479 species of fish, including the iconic and threatened Napoleon wrasse. The property supports the highest population densities known in the world for white tip reef sharks. Pelagic species such as jacks, tuna, barracuda, manta rays, whale sharks and different species of sharks also are common here and the property is a very important nesting, resting and juvenile development area for two species of endangered marine turtles: green turtles and hawksbill turtles. There are seven breeding species of seabirds, and Bird Islet and South Islet are breeding grounds for seven resident and endangered species of seabirds. The critically endangered Christmas Island Frigatebird is a regular visitor to the property.*

Integrity

The property comprises two atolls (North and South Atoll) and an emergent coral cay, Jessie Beazley Reef. It includes open sea with an average depth of 750 m and still displays a well preserved marine ecosystem with top predators, and a large number and diversity of coral reef and pelagic species. The property also hosts an important population of resident, nesting and feeding seabirds. The area is free of human habitation and activities and is of a sufficient size to maintain associated biological and ecological processes. The property is of an adequate size to ensure the complete representation of the key features and processes of the reef systems, although the maintenance of its values also requires measures to be taken outside the boundaries of the property in relation to some migratory species and the buffering of the property from threats to the marine environment that could occur in the wider area. A key aspect of the integrity of the property is the low level of fishing pressure, due to the no-take policies which are in place throughout its area.

Management and protection requirements

Tubbataha Reefs Natural Park is legally protected through national protected areas legislation and a range of other environmental legislation which enable action to be taken against a wide range of threats. The implementation of this legislation is assisted by clear delegation to the management authority for the property. This is a remote property and its management is therefore a significant logistical challenge, requiring a well-equipped team with operational boats, well trained and well equipped staff and a sufficient operating budget for fuel, maintenance and accommodation to ensure a strong and responsive presence on the water. Tourism visitation requires careful planning and management to ensure the values of the property are maintained, and to respect the capacity of the property, as well as visitor safety and to ensure income is returned to both site management and local communities. There are threats to the property from shipping, marine litter and land-based sources of pollution, fishing, marine pollution and oil exploration. Thus, effective buffer zone arrangements are needed, and internationally supported legislation to protect the property from shipping threats, and greater enforcement of marine litter regulation on the High Seas by the appropriate international organisations would be a significant benefit to the property.

4. Thanks the State Party for acting on the Committee's 1993 recommendation that the area of the property be extended, and for the action in response to the Committee's previous consideration of state of conservation issues affecting the existing property;

5. Commends the State Party and specifically the Province of Palawan and the Tubbataha Protected Area Management Board for the progress in managing the property, and the allocation of increased budgets and equipment to the property, and also acknowledges

the important technical and financial support provided by the Non Governmental Organisation partners;

6. Welcomes the inter-agency cooperation at the Provincial and National levels to support the extended property; and encourages these stakeholders to continue this work particularly towards improving enforcement and halting illegal fishing activities, assessing the relevance of designation of Particularly Sensitive Sea Areas for the region surrounding the property, and ensuring the sustainable financing of the management of the property;

7. Also welcomes the boundary changes to oil concession areas near to the extended property which will reduce their potential impacts, and encourages the State Party to ensure that concession holders respect the Outstanding Universal Value and integrity of the property; noting in particular the sensitivity of marine mammals to acoustic research methods and the potential risk to the values and integrity of the property from pollution;

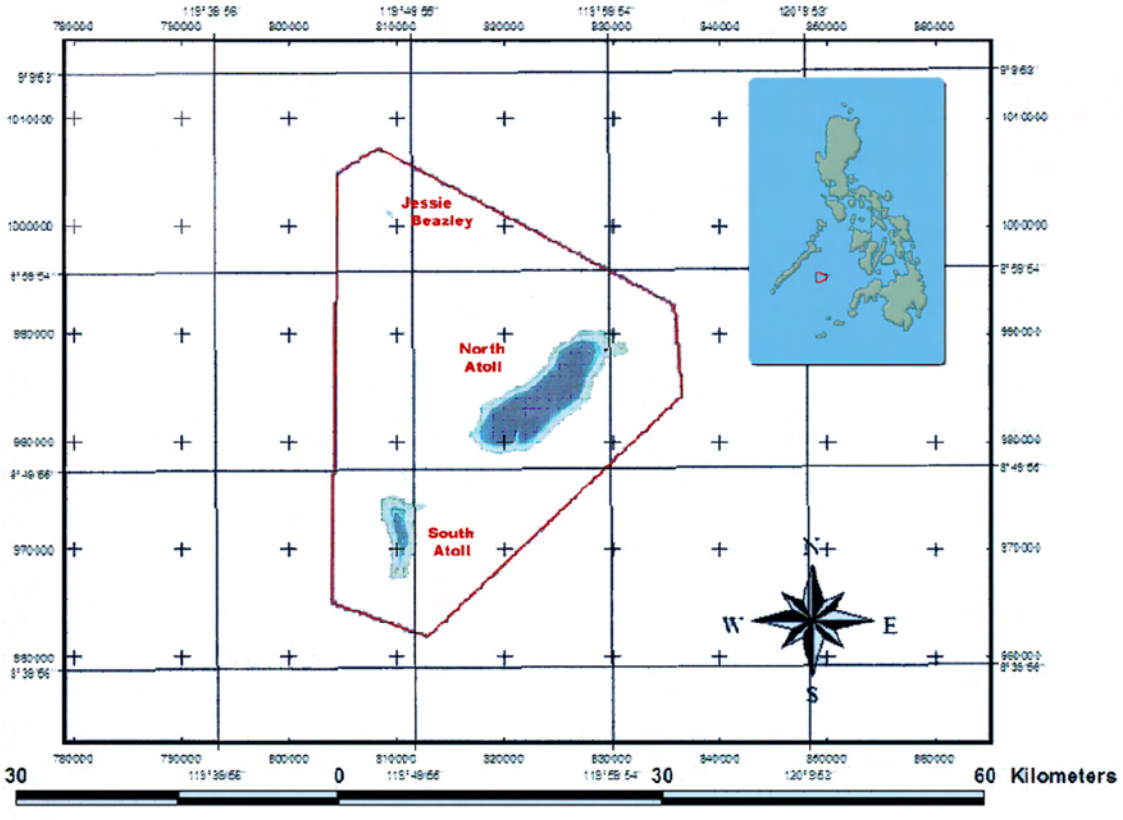
8. Regrets that illegal fishing continues to affect the existing and extended property, and urges the State Party to continue to seek ways to increase compliance with the no-take policies within the extended property;

9. Requests the State Party to put in place a programme of ecological monitoring of the extended property, particularly the effect of climatic events on sea surface temperature and coral bleaching, storm frequency and other factors that could be related to climate change;

10. Also requests the State Party to develop a tourism strategy in collaboration with stakeholders and fishing community to ensure that increased tourism does not impact the Outstanding Universal Value and integrity of the property;

11. Also requests the State Party to provide the World Heritage Centre by 1 February 2011 a report on the state of conservation of the property, including progress in establishing a buffer zone, reducing illegal fishing activities, continued provision of adequate funding for the management of the property and the other issues noted above, for examination by the Committee at its 35th session in 2011.

Map 1: General location of nominated property and its extended boundaries.



A4 Boundary Modifications of Natural Properties

Latin America / Caribbean

Manú National Park

(proposed minor boundary modification)

Peru

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

MANÚ NATIONAL PARK (PERU) – ID No. 402

IUCN carried out a desk review of the proposed modification to the boundary Manú National Park, Peru, taking into consideration comments from three external reviewers.

1. BACKGROUND INFORMATION

Manú National Park was inscribed on the World Heritage List in 1987 under natural criterion (ix) and (x). In the state of conservation report considered by the World Heritage Committee at its 31st Session (Christchurch, 2008), the Committee noted that the park was enlarged on July 14, 2002 by adding 257,000 ha of what had been previously known as the Manu Reserved Zone (Supreme decree # 045-2002-AG) resulting in a current area for Manú National Park, as defined in national legislation, of 1,696,803 ha. It was further noted that the nomination file held at the World Heritage Centre indicates a total surface area for property of 1,532,806 ha, and that the map provided with the original nomination appears hand drawn with boundaries that do not conform to the boundaries illustrated in the nomination.

The 1985 management plan for the Manú National Park was updated in 2002, covering both the World Heritage property and a co-designated Biosphere Reserve (for which the property forms the "core zone" as defined in the UNESCO Man and Biosphere programme). In decision 31COM 7B the World Heritage Committee requested the State Party to provide an updated map of the property including clear boundaries; and also requested the State Party to submit a request for a minor boundary modification to reflect the extension of the property, in accordance with Paragraphs 163 and 164 of the *Operational Guidelines*.

In the state of conservation report provided to the 32nd Session of the World Heritage Committee (Québec City, 2008) it was noted that the State Party submitted an updated map of the property to the World Heritage Centre. The State Party made reference to the Manú National Park and the Biosphere Reserve, but in the map, the latter's boundaries were not clearly indicated, and as a result, there remained room for doubt as to the exact property boundaries. The map provided by the State Party also did not indicate the location of the extensions, and the discussion of the property's values and management did not clearly differentiate between the part inscribed in 1987, and the proposed extension. Thus, in Decision 32 COM 7B.39, the World Heritage Committee repeated its invitation to the State Party to submit a request for boundary modification, including a precise map illustrating lands proposed for inclusion in the property.

The State Party presented further information regarding the proposed boundary modification, which was transmitted to IUCN for review in September 2008. IUCN has considered this carefully. Following review of the nomination the IUCN World Heritage Panel requested in December 2008, that the World Heritage Centre seek clarification on a number of points from the State Party. This request was not relayed directly to the State Party, however the World Heritage Centre noted information in relation to the proposal to assist IUCN's consideration of this file in March 2009. The information provided below integrates this information provided via the World Heritage Centre as well as input from external reviewers.

2. SHORT SUMMARY OF PROPOSAL

According to information provided by the State Party, the proposal would extend the existing inscribed area of the Word Heritage property by c. 215,500 ha to a new total area of 1,716,295.22 ha. This would establish the boundary of the World Heritage property on the same boundary as the Manú National Park and would include the areas designated as "core zone" and "buffer zone" under the UNESCO Man and Biosphere programme. This modification would rationalize the boundaries of the World Heritage property so that they would coincide with the boundaries of Manu National Park, and not just a portion of it.

3. IMPLICATIONS FOR OUTSTANDING UNIVERSAL VALUE AND INTEGRITY

The proposed minor boundary modification would enhance the integrity of the property and add new values to the property that relate to the criteria under which the property is inscribed. The extension is highly significant because it recognises the lower Manú River basin thereby extending the protection of the entire watershed of the Manú River. The most important lakes in the whole basin are located here. They host several giant otter families, and also harbour an important black caiman population, as well as the largest beaches in the park, of importance for breeding populations of turtles and shorebirds.

The area is reported to be home to a small number of indigenous peoples (Mashco-Piro families living in voluntary isolation). As yet there are no land use conflicts in the area from this population and wildlife is largely not impacted by hunting.

The area proposed to be added to the property is regarded as being in a similar state of conservation to the rest of the existing World Heritage property,with some additional considerations:

- The area is near the village of Boca Manú and the communities and settlements in the Upper Madre de Dios.
- The area is currently the focus for all tourism activity directed at the lowland sector of the park. Tourism is likely to remain focused in this area because it is the most accessible portion of the lowland sector of the park due to its proximity to the airport at Boca Manú.

The extension is thus a particularly important part of Manú National Park from both conservation and public use standpoints.

Rationalization of the property boundary so that it is the same as the nationally recognised boundary would facilitate management of the property as a whole. The land proposed to be added to the property is under the same management regime as the existing inscribed property, as has been the case for the past 7 years. There are no implications on the legal protection from accepting the additional area to be included in the World Heritage property, as the same level of protection as the existing inscribed property is already in place within it. Most of the lands included in the area proposed for addition to the property had been under a different protection regime prior to 2002 and some were under public ownership, registered under INRENA (the National Natural Resources Institute, responsible for protected areas). Those lands under the previous Reserve Zone status not considered suitable for inclusion in the National Park were not included in in Manú National Park when it was extended in 2002, ensuring that only lands with conservation status and integrity at the level appropriate were added to the existing national park.

The management arrangements in general are similar to those for the rest of the property. The extension lands benefit from two management authority control posts, one at the most accessible entry point (Limonal) and another further upstream (Patkitza). It is intended that only authorized visitors who have paid a fee are allowed to proceed past Limonal into the property. Anyone who is not an approved scientific researcher or a tourist accompanied by an approved guide is not supposed to enter the park. IUCN notes that it is reported that the park has been unable to enforce its contracts with tourism enterprises and a dispute over the payment of concession fees continues unresolved in the courts after a number of years of litigation.

A 2004 aerial survey of land use changes within the national park (including the 2002 extension lands) revealed that the main areas of conservation concerns were not within the proposed addition to the property included in the suggested boundary modification, but within the boundaries of the property that is already inscribed on the World Heritage List.

Park policy is that indigenous peoples living within the park boundaries have the right to continue living within the park provided they continue to pursue traditional lifestyles. This policy specifically prohibited the use of firearms and mechanized implements, particularly, motorboats and chainsaws. It is reported that more recently these restrictions have been relaxed, not because of a change in policy but because of lack of capacity to effectively enforce the restrictions. Several motorized boats, chainsaws and shotguns are in use in the park and the expansion of lands cleared for agriculture and the depletion of game around villages is reported to be increasing. For this reason, the existing inscribed property is subject to increased pressures and the lower Manú Basin is the only remaining intact part of the park's lowland sector.

In summary, IUCN considers that the proposed modification will enhance the integrity of the property and facilitate its more effective management.

4. RECOMMENDATION

IUCN recommends that the World Heritage Committee adopt the following decision:

The World Heritage Committee,

1. Having examined Documents WHC-09/33. COM/8B, and WHC-09/33.COM/INF.8B2,

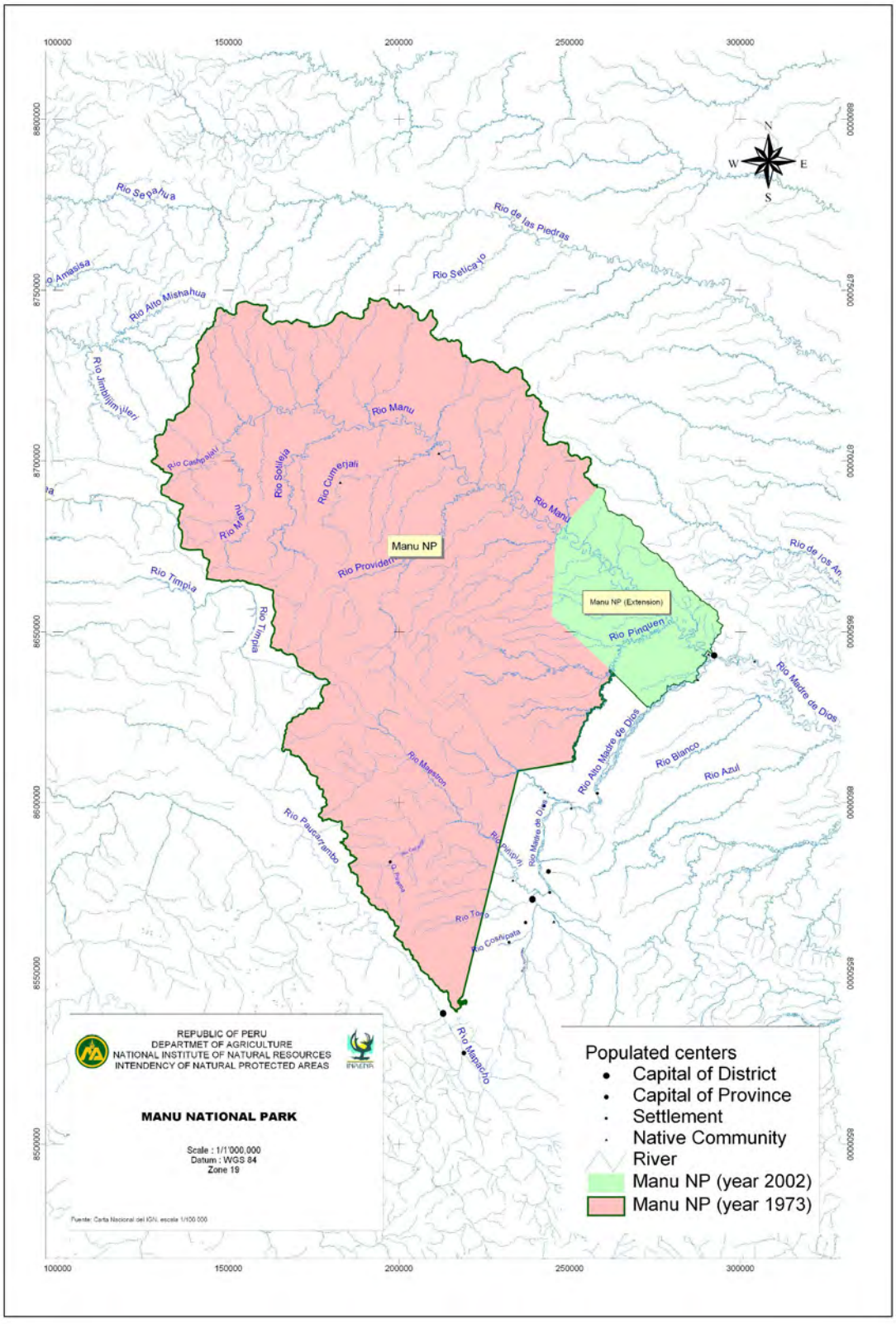
2. Approves the proposed modification to the boundary of **Manú National Park, Peru,** in order to rationalize the property boundaries so that they include the entire Manú National Park, and considers that this minor modification will enhance the integrity and protection of the property, and facilitate its more effective management,

3. Encourages the State Party to enhance its efforts to implement the management regime for Manú National Park within the extended property and to manage the lands adjacent to the property to guarantee the conservation of its values and integrity from threats arising from outside its boundaries,

4. Takes note of the reported pressures on the existing World Heritage property that have been reported through the evaluation of this minor modification,

5. Requests the State Party to submit to the World Heritage Centre, by **1 February 2010**, a report on the state of conservation of the property and the threats to its Outstanding Universal Value and integrity, for examination by the World Heritage Committee at its 34th Session in 2010.

Map 1: Modified boundaries of nominated property



B1 New Nominations of Mixed Properties

Asia / Pacific

Mount Wutai

China

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

MOUNT WUTAI (CHINA) ID No. 1279

1. DOCUMENTATION

i) Date nomination received by IUCN: 15th March 2008.

ii) Additional information officially requested from and provided by the State Party: no supplementary information was requested, however, additional information was provided by the State Party prior to and after the field visit.

iii) Additional Literature Consulted: Wells, R. 1996. **Earth's Geological History-A Contextual Framework for Assessments of World Heritage Fossil Nominations**. IUCN; Dingwall P. et.al. 2005. **Geological World Heritage: A Global Framework**. IUCN; China Ministry of Construction. 2008. **Proposal for Extensions to the Mount Taishan World Heritage site**. Draft; Parks Canada. 2004. **Tentative List**. 46p.; Nyiri, Pal.2006. **Scenic Spots - Chinese Tourism, The State, and Cultural Authority**. U. Wash Press.134p.

iv) Consultations: 8 External Reviews. The mission was carried out jointly with ICOMOS. The mission met with a wide range of stakeholders in this site including representatives of the State Party, including the senior leadership of the province, senior representatives of the religious community, local community representatives, scientists and site managers dealing with the natural and cultural management of the property.

v) Field Visit: Jim Thorsell with Shintaro Sugio (ICOMOS), September 2008.

vii) Date of IUCN approval of this report: 17th April 2009

2. SUMMARY OF NATURAL VALUES

Mount Wutai is nominated as a mixed property, under five cultural and one natural criteria. The nomination also considers the values of the property as a cultural landscape. This evaluation report by IUCN addresses the natural values of the property, and the cultural values will be considered by ICOMOS.

The nominated property is located in Wutai County, Xinzhou City Region which lies in the northeast of Shanxi Province. It is nominated as a serial property consisting of two component parts some 10km apart. The total size of the two component parts is 18,415ha and two separate buffer zones totalling 42,312ha surround each of the component parts and are not part of the area nominated for inscription. Details of the two component parts are in the table shown below.

Mount Wutai is a mountainous area, with the highest peak of 3061m. This region of northeast China has undergone major uplifting and block faulting. The geology of the area including and surrounding the nominated property consists of a large fault block of rocks of Archean and Proterozoic age. The early Proterozoic Era is the first of the three sub-divisions of the Proterozoic and is the period when geologists consider continents first stabilized, and the first type of bacteria evolved.

The nominated property displays good geological outcrops of the different strata due to its mountainous topography. It provides a window to study the early geological evolution of the Earth. Its exposed strata reveal a continuous section of an early Precambrian collisional orogenic belt. The stratigraphy includes a large granite-greenstone belt, one of the typical geological formations found in areas of Archean

Table 1: Component Parts of the nominated property

Name of nominated component part	Location	Area nominated (ha)	Area of proposed buffer zone (ha)
Taihuai	Taihuai Town, Wutai County	17,946	41,337
Foguang Temple	Foguang Mountain, Wutai County	469	975
TOTALS		**18,415**	**42,312**

geology. The stratigraphic succession also contains exposures across the Archean-Proterozoic geochronological boundary (c. 2.5 billion years before present) which have established importance for geological correlation. There are at least 131 beds displaying stromatolites which were formed by sheets of early bacteria.

Mount Wutai displays a number of landforms. The North Terrace of Mount Wutai, at 3061m, is the highest peak in north-east China. The intramontane rift basins range from 900m to 1500m in altitude, with thick sediments of loess. The mountains are reported to include five planation surfaces resulting from different stages of uplifting of the area. The geomorphology was further modified by periglacial activity and displays a series of related typical features.

The associated biological values of Mount Wutai are also regionally important and include over 1,000 species of vascular plants, 14 species of orchids, 142 bird species and over 2,000 insect species.

The mountainous location is associated with cultural values as a centre for Buddhist Manjusri worship. Some 68 temples and 150 pagodas are found throughout the nominated property. The cultural values of the property have been evaluated by ICOMOS following the joint ICOMOS-IUCN mission. IUCN and ICOMOS have also exchanged views during the evaluation process to ensure coordination in their recommendations to the World Heritage Committee.

3. COMPARISONS WITH OTHER AREAS

The nomination document contains a comparative analysis of the nominated property in relation to its natural values. Much of this discussion is based on tables comparing Mount Wutai to 52 existing World Heritage properties on the basis of the framework provided in IUCN's Geological World Heritage Framework thematic study. The analysis demonstrates clearly that there are a number of other properties with some similarities with Mount Wutai in terms of five of the Geological Framework's thematic topics: tectonic and structural features (seven existing properties), mountain systems (21 existing properties), stratigraphic sites (at least two existing properties), fossil sites (15 existing properties), and ice age sites (at least seven properties). This analysis suggests that the key values of Mount Wutai are already represented in the World Heritage List.

Site specific comparisons are not made in the nomination with other similar areas not currently included on the World Heritage List, including sites included on the Tentative Lists of other countries, Amongst these tentative list sites, IUCN notes Barberton / Makhonjwa Mountain Land (South Africa) has a stated significance for its accessible Archaean exposures present a continuous 350 million year sequence of rocks, from 3600 million years in age. It is noted as including records of Earth's earliest life forms, including microfossils, stromatolites, biomats and other organically derived material; records of the formation of the earliest continental crust; several of the earliest and largest meteorite impact events and a number of other values.

Some regional analysis is carried out in the nomination of Mount Wutai with other major areas of similar geology located in southern Africa, Australia, Canada, however other comparable areas such as those in Scandinavia, Brazil and Siberia are not discussed within the comparisons.

IUCN's has carried out its own analysis, and this suggests that the geological values of the Mount Wutai do not appear to provide a strong claim for outstanding universal value. This conclusion is supported by the input of a number of expert reviewers. IUCN notes that the principal values asserted under criterion viii, whilst of undoubted importance for the relevant branches of the geosciences, are relatively specialised and also represented in other locations. Many of the values that are noteworthy have their principal significance at the national or sub-regional level. The broad values of Mount Wutai are displayed in a comparable way both in China and in a number of localities elsewhere.

Specific points that are drawn from this analysis include the following:

a) Whilst the precise time interval represented by Mount Wutai is not currently recognised on the World Heritage List, this is not a basis for inscription. It is also noted that the exposure of this interval is not unique and that major outcrops from this time are exposed in locations such as South Africa (Barberton), West Greenland, Western Australia, the Canadian Shield and a number of other localities. Proterozoic successions are already included in the Grand Canyon (United States of America), Gros Morne (Canada) and Canaima (Venezuela). It should be noted these are all younger Proterozoic rocks that those of Mount Wutai.

b) A number of the key features of the geology of the property appear to have a number of comparators of equal or greater value. For example, it was noted that older examples are known from around 20 sites, and superbly preserved examples of comparable age occur throughout Northern Canada, Australia and Siberia. The structural geological values are replicated by other mountain areas, including within China.

c) Reviewers noted that a number of the claims, whilst in the literature, are still subject to debate and verification. It was noted that the evidence regarding early eukaryotes is noted in the recent global review as a candidate, but with significant caveats and that

a high degree of international attention has yet to be received for this feature. The succession is suggested to include an Archaean aged ophiolite (a type of rock that is formed deep in subduction zones), which if confirmed is a candidate to be the oldest known at 2.5 billion years. However, it is also noted that there is a much older example, also controversial, from Greenland. IUCN notes that these types of values are in any case drawn too narrowly to provide a compelling case for Outstanding Universal Value.

d) The geomorphological values of the property are noted as interesting but not at the level of many of the properties already included on the World Heritage List. As a single mountain, Mount Wutai would rate of lesser importance that many World Heritage mountain sites, although is impressive in a Chinese/ East Asian context. The periglacial features are also a widespread phenomenon and present as parts of other properties. The geomorphological processes are typical of many similar mountain systems, for example Mount Hengshan in Hunan Province is another Chinese example of this type of mountain building.

Mount Wutai does appear to have a national/regional significance as it provides the key site to explain the regional geology of the ancient basement of North China, and is considered the best example of this geology in China. IUCN also notes that the mountain landscape values are certainly an important support and setting to the cultural features and values of Mount Wutai, even though they are not of Outstanding Universal Value in their own right. In summary, IUCN considers that the case for inscription of Mount Wutai under natural criterion viii is not supported by comparative analysis.

4. INTEGRITY

4.1. Protection

The nomination clearly identifies the provisions and relevant articles that govern the legal status of the nominated property. The nominated property is State owned, and the State is also responsible for the laws and regulations relating to conservation of heritage areas. There are four different legal provisions that apply to the natural environment from both the national and provincial levels including Mount Wutai's designation as a National Park (1982) and National Geopark (2005). These are backed up by twelve environmental laws and regulations. The legal status of the nominated property thus is a mix of acts and regulations and these appear adequate for effective management of its geological resources. The effectiveness of its protection for cultural values will be assessed by ICOMOS.

IUCN considers the protection status of the nominated property meets the requirements set out in the *Operational Guidelines* in relation to natural values.

4.2 Boundaries

The geological map of Mount Wutai indicates that the extent of the mountain is much wider than the area being nominated. Indeed, the land area of the Mount Wutai National Geopark (83,200 Ha) is more than four times the size of the nominated area. Many of the geological features of Mount Wutai thus extend beyond the borders of the nominated property and, indeed, many of them (e.g. stromatolite fossils) are better accessed and studied outside the nominated area due to their greater accessibility. The nominated area of the main Taihuai component of nomination has been delineated to encompass the five main peaks of Mount Wutai and to exclude areas of agricultural use and human settlement (with the exception of Taihuai town where the main temple complex is located). The Foguang Temple component is small (469ha) and primarily displays cultural values, with some additional, but not significant geological values.

In general, the boundaries of the nominated property appear to be primarily defined to encompass the cultural features of the property. They encompass a typical area of the geology of Mount Wutai but are not the best selection of the natural values for which the property is nominated.

IUCN considers that the boundaries of the nominated property are not optimal, in relation to the requirements set out in the Operational Guidelines, in relation to natural values.

4.3 Management

The Ministry of Construction has the overall responsibility for management of Mount Wutai, with several different agencies of Shanxi Province directly involved in management. Three somewhat overlapping planning documents exist: 1987 Master Plan for Mount Wutai National Park, the updated 2005 Master Plan and the 2005-2025 Conservation and Management Plan. The park is divided into four zones, one of which allows some forestry and agricultural activities. There also exists a National Park System Plan for Shanxi Province. The buffer zone management is subject to a special set of regulations on land use in the adjoining areas. An environmental monitoring program is also in place. IUCN notes that relocation of some local residents and restoration of associated farmland in the vicinity of the temples has been undertaken. In principle, IUCN notes that such practices should only be carried out on a voluntary basis, with full, free consent and appropriate compensation and support. This principle appears to have been followed in this case.

The management of the nominated property has

a substantial budget of c. CNY 8,6 million (c. USD 1.26 million). 756 staff are employed in the nominated property, all of whom have received on-job training. Mount Wutai has well-designed entrance gates, a visitor centre and a network of interpretive signs throughout the nominated property and the buffer zone. Researchers and experts from other agencies also offer scientific guidance. The majority of the management of the property is oriented to its cultural values and will be assessed by ICOMOS.

IUCN considers the management of the nominated property meets the requirements set out in the *Operational Guidelines* in relation to natural values.

4.4 Threats

Threats to geological features in Mount Wutai are limited due to the extensive and resilient nature of the exposures. Moreover, the environmental regulations for the nominated property strictly forbid land-clearing, stone mining, soil and sand mining, smelting, water diversion, as well as other activities that may cause pollution and detriment to the environment. Some removal of fossils by visitors is possible but has not been noted to date and due to the large size of the rocks such illegal activity would be unlikely. High levels of tourism are a potential concern in relation to the quality of the overall visitor experience. The nomination notes that Mount Wutai received 3.3 million visitors in 2007, but due to more accurate measures for counting a figure of 1.2 million per year is said to be more realistic. The majority of visitors focus their time at the temples and pagodas and few are there to view the geological features. Very little threat or disturbances to geological features (other than road building to all the five summits that has occurred) can be expected. The threats to the cultural heritage values of the property will be discussed in the evaluation by ICOMOS. IUCN noted to ICOMOS that it considered the road building plans and their impacts on landscape values were one specific area of concern that would warrant exploration during the evaluation process related to cultural landscape values.

In summary, IUCN considers the nominated property meets the conditions of integrity in relation to natural values, however the definition of its boundaries is not optimal. An assessment of integrity in relation to the cultural values of Mount Wutai will be considered by ICOMOS.

5. ADDITIONAL COMMENTS

5.1 Justification for Serial Approach

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

a) What is the justification for the serial approach?

In this case the main justification is that the Foguang Temple component (469 Ha) of the nominated property contains a very significant Buddhist temple. A serial approach does not appear to be clearly justified in relation to natural values.

b) Are the separate component parts of the nominated property functionally linked in relation to the requirements of the *Operational Guidelines*?

The Foguang Temple component is part of the broader geological region that surrounds Mount Wutai, and which is much more extensive than the area encompassed by the two nominated components. There do not appear to be strong functional linkages between the two selected component parts in relation to natural values, nor a clear rationale for the selection of these components, in the context of the wider area of Mount Wutai.

c) Is there an effective overall management framework for all the component parts of the nominated property?

Such an overall management system appears to be in place, at least in relation to the management of natural values. In addition to being under the same management authority, both components are included within the “Conservation and Management Plan for the Nominated World Heritage Site of Mount Wutai”.

6. APPLICATION OF CRITERIA

Mount Wutai has been nominated as a mixed property under natural criterion (viii), together with five cultural criteria which will be considered by ICOMOS. IUCN’s evaluation in relation to the natural criterion is as follows:

Criterion (viii): Earth’s history and geological features

Mount Wutai presents an accessible section of Archaean and Proterozoic aged rocks, which have attracted international interest amongst the geoscience community. There are many other areas of the world which display similar geological values that are comparable to those of Mount Wutai, and whilst each of these, including the nominated property, adds important information to geoscientific knowledge, there is no compelling evidence to conclude that Mount Wutai is of exceptional significance. The sequence of rocks exposed at Mount Wutai is regionally important in understanding the geology of the basement of northern China, and is probably the most important rock exposure within which this can be achieved.

However, the geological values cannot be considered to be of Outstanding Universal Value. Although the protection and management of the nominated property is adequate in relation to the resilient natural values of the geological exposures, the boundaries have been designed primarily in relation to the cultural, rather than the natural values. The property thus meets the conditions of integrity in relation to natural values although the boundary is not optimal in relation to natural values.

IUCN considers that the nominated property does not meet this criterion.

7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopt the following draft decision:

The World Heritage Committee,

1. Having examined Documents WHC-09/33.COM/8B and WHC-09/33.COM/INF.8B2,

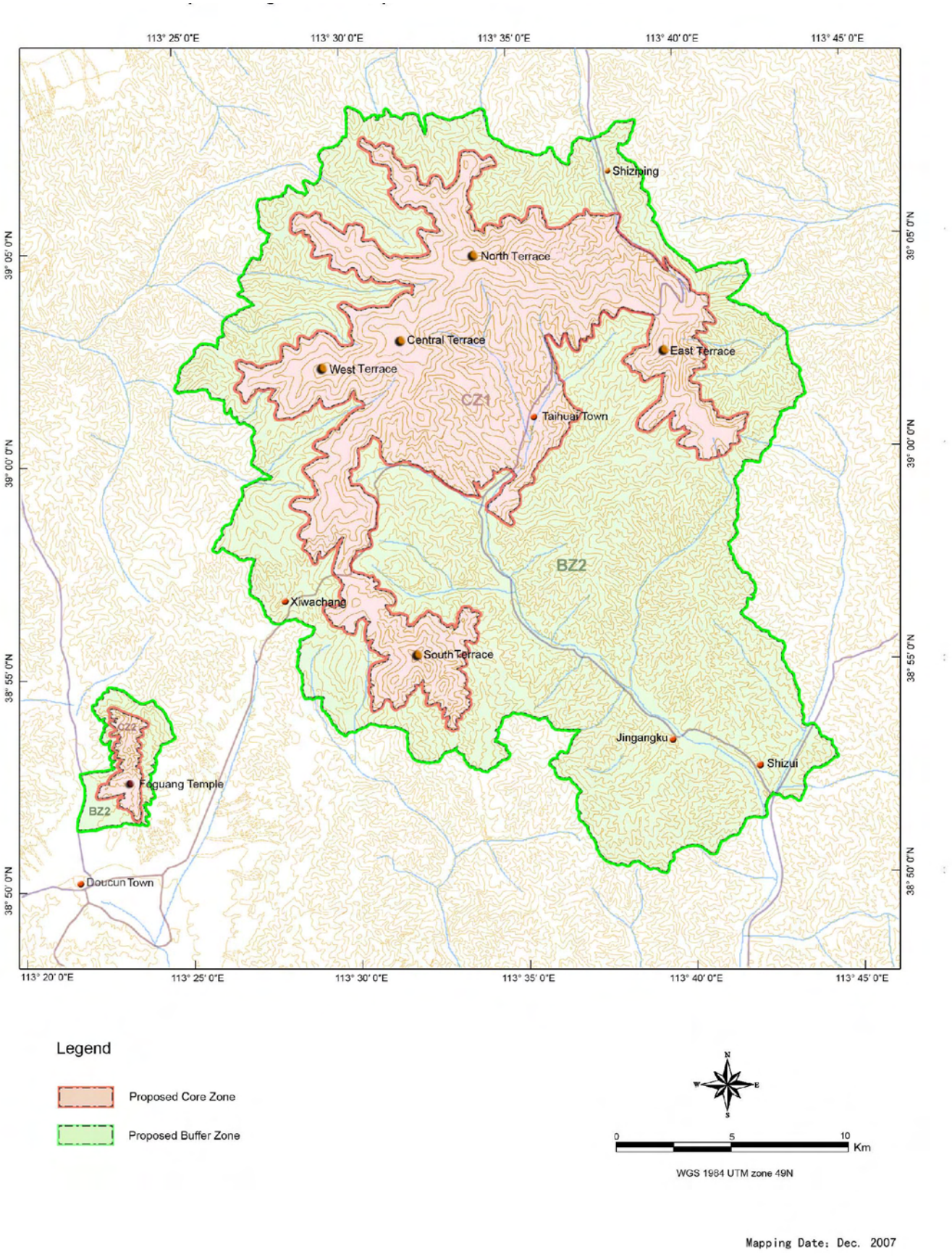
2. Decides not to inscribe **Mount Wutai, China,** on the World Heritage List under natural criteria;

3. Takes note that the geological values of the property are recognised through its inclusion in a national geopark, and encourages further work on this initiative integrated into the overall management of the cultural landscape of Mount Wutai.

Map 1: General location of nominated property

Map 2: Boundaries of the nominated property and its proposed buffer zones.

(Note: the State Party refers to the nominated property as “core zones”.)



Europe / North America

Lonjsko Polje Nature Park

Croatia

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

LONJSKO POLJE NATURE PARK – A LIVING LANDSCAPE AND THE FLOODPLAIN ECOSYSTEM OF THE CENTRAL SAVA BASIN (CROATIA) ID No. 1311

1. DOCUMENTATION

i) Date nomination received by IUCN: 15th March 2008

ii) Additional information officially requested from and provided by the State Party: No supplementary information was requested from or provided by the State Party.

iii) IUCN WCMC Data Sheet: Sourced from nomination document which cites 140 references.

iv) Additional Literature Consulted: WWF Austria (1990) **Ecological bricks for our common house of Europe.** Politische Ökologie, Sonderheft 2, Wien; Thorsell, J. Ferster Levy, R. and Sigaty T. (1997) **A global review of wetland and marine protected areas on the World Heritage List**. IUCN, Gland Switzerland; Heath,M.F. Evans, M.I. Hoccom, D.J. Payne, A.J and Peet, N.B. (2000). **Important Bird Areas in Europe; Priority Sites for conservation, Volume 2: Southern Europe**. Birdlife International; Thorsell, J. Sigaty T. (1997) **A global overview of forest protected areas on the World Heritage List: A contribution to the Global Theme Study of World Heritage Natural Sites**. IUCN, Gland, Switzerland; C. Magin and S. Chape, (2004) **Review of the World Heritage Network: Biogeography, Habitats and Biodiversity**. IUCN, Gland, Switzerland.

v) Consultations: 4 external reviewers. Extensive consultations were undertaken during the field visit with representatives from the Ministry of Culture, the Ministry of Agriculture, Fishery and Rural Development, the Ministry of Environmental Protection, Spatial Planning and Construction, local communities and non governmental organizations.

vi) Field Visit: Gerhard Heiss and Annelie Fincke (IUCN) and Luisa de Marco (ICOMOS), August 2008.

vii) Date of IUCN approval of this report: 15th April 2009.

2. SUMMARY OF NATURAL VALUES

Lonjsko Polje Nature Park (LPNP) is nominated as a mixed property under two cultural and two natural criteria, and as a cultural landscape. This IUCN evaluation report addresses the natural values of the property, and the cultural values will be considered by ICOMOS.

LPNP is located in the northern part of Croatia, and shares about one third of its southern boundary with the neighbouring State of Bosnia and Herzegovina. The nominated property covers an area of 51,136 ha and is surrounded by a buffer zone of 130,360 ha. No buffer zone has been defined where the boundary of the nominated property forms part of the national boundary. The buffer zone is not part of the nominated property.

The river Sava is a major tributary of the Danube with a length of 945 km. The Sava Basin covers a total area of 95,419 square kilometres, of which 24,283 square kilometres are situated in Croatia. The nominated property is located on the eastern bank of the Sava, in the central part of the Sava Basin, around half way between the source and its confluence with the Danube at Belgrade. This is a lowland area with an altitude between 90 and 150 m above sea level. Flooding is an important natural process within the property. LPNP is covered by alluvial sediments from the Quaternary consisting of gravel, sand, clay and ooze which may attain several tens of metres in thickness. The resulting landscape is dominated by a flat relief in which the river has built terraces (ridges).

The Central Sava Basin includes the largest complex of alluvial hardwood forests in Europe and the Western Palaearctic (about 60,000 ha). Regular flooding is the key natural process to maintain an intact alluvial forest ecosystem. During periods of spring and autumn, LPNP is flooded by the Sava. The nominated property includes 25,550 ha of alluvial forests: about 23,500 ha are dominated by oak and ash, and a further 2,000 ha dominated by willow, poplar, and alder type forests. 24% of the property (about 9,500 ha) is covered by oak and hornbeam forests on elevations and ridges which are generally

outside the range of floodwater. The total forest area within LPNP covers about 35,000 ha.

The flora of LPNP includes c. 550 vascular plant species. No data on other plant species groups are given in the nomination document. Information on fauna is also incomplete and a total number of existing animal species found within the property is not available. LPNP is home to 15 species of amphibian, 12 species of reptiles, 27 species of fish and 58 species of mammals. LPNP also hosts 250 bird species of which 134 species breed within the property.

Species of conservation significance include otter, wolf, white stork (about 500 pairs), black stork, sea eagle, spotted eagle, lesser spotted eagle, marsh harrier, hen harrier, Montagu's harrier, ferruginous duck, whiskered tern, corncrake (280 singing males in 2003), little egret, spoonbill (up to 280 pairs), and little crake. Among insects, rhinoceros beetle, stag beetle and oak longicorn are notable.

The cultural values of the property will be considered by ICOMOS. IUCN and ICOMOS have exchanged views during the evaluation process to ensure coordination in their recommendations to the World Heritage Committee.

3. COMPARISONS WITH OTHER AREAS

The nominated property is part of the Middle European Forest biogeographical province with significant influences of the Pannonian province (dominated by narrow-leaved ash *Fraxinus augustifolia*).

A number of existing World Heritage properties can be compared to the nominated property. At a global level, the property is clearly much smaller and less species-rich than the most significant forest and wetland World Heritage properties.

Middle European Forests are currently represented on the World Heritage List by the Primeval Beech Forests of the Carpathians (Slovakia/Ukraine) and Srebarna Nature Reserve (Bulgaria). The 29,279 ha serial property of the Primeval Beech Forests of the Carpathians cannot be compared with alluvial hardwood forests of oak and ash within the LPNP as it is located in upland areas. Srebarna Nature Reserve is a lake remnant of the ancient floodplains of the lower Danube. It is an early inscription (1983) with rather restricted size of 638 ha, reflected in a lower number of bird species (180 bird species, of which 100 breed in the reserve) than LPNP, but a high density of species considering its size. In addition Belovezhskaya Pushcha/Białowieża Forest (Belarus/Poland) is a key remnant of primeval lowland forests in Europe, covering an area of 92,669 ha. The dominant forest association is lime-hornbeam with oak, a quite different character to LPNP.

Two wetland World Heritage properties are also comparable within the region: Danube Delta (Romania) was inscribed in 1991 and is 312,440 ha in area, and is thus around six times the area of the nominated property. This is the second largest delta in Europe hosting a high diversity of bird species. Species diversity (more than 300 bird species, of which more than 160 are breeding within the territory) and numbers of birds are higher than those in the nominated property. Doñana National Park (Spain) was inscribed in 1994 and is 54,252 ha in area. Located at the mouth of the Guadalquivir this property is famous for its diversity and quantity of bird species. While LPNP bird diversity (250 bird species, of which 134 are breeding on the territory) reaches the level of Doñana (about 250 bird species, of which 125 are breeding on the territory), total bird numbers are considerably higher in Doñana (e.g. 350 spoonbills, 70,000 greylag goose, 200-300,000 ducks, 20,000 black-tailed godwits, 10,000 flamingoes).

A number of other wetlands and lowland forests are also comparable within the region:

Donauauen National Park (Austria), Thaya National Park (Austria/Czech Republic), March Nature Reserve (Austria): Extensive alluvial forests (about 80,000 ha) are found in the borderland of Austria, Czech Republic and Hungary between Vienna and Györ. The different forest complexes are separated from each other and softwood forests dominate. Natural flooding of alluvial forests is seriously disturbed in most parts of the complex by heavy engineering works (e.g. Gabcikovo). 109 breeding bird species are recorded within this region.

Lower Reaches of the Drau and Kopacki-Rit (Croatia/Hungary): Extensive alluvial forests exist along the Drau and its mouth into the Danube. The most valuable parts are protected in the Kopacki-Rit Nature Reserve which the World Heritage Committee decided not to inscribe on the World Heritage List in 1999. Although smaller in size, the reported values of the Kopacki-Rit are similar to, or greater than those of the nominated property. 267 bird species are found there, among them 400 pairs of night heron and 20 pairs of sea eagle. The area of alluvial forests in Kopacki-Rit is significantly smaller than in LPNP.

Bierbza Marshes National Park (Poland): The Bierbza Marshes are the largest untouched marshlands of Central Europe. Half of the area is protected as a national park (47,000 ha), although extensive alluvial forests do not exist in this area.

Prypyat swamps (Belarus/Ukraine): The swamps of river Prypyat are amongst the most extensive wetlands of Europe outside the boreal zone. Prypyat swamps are shared between Belarus and Ukraine,

and several reserves exist within the region, most notably the Prypyatskiy Strict Nature Reserve (Belarus) of 62,213 ha and the Polissian Swamps and Slovechno-Ovruch Ridge Nature Reserve (Ukraine) at 37,110 ha. The Prypyat swamps are located within the biogeographical province of Middle European Forest following Udvardy's classification. However, the forests found there show boreal and neo-boreal characteristics (spruce and pine are dominant) and reach in northern Ukraine their southern limit. Riparian hardwood forests are not known from this region.

In summary:

- LPNP is of significance as part of the most extensive complex of alluvial hardwood forests in the Western Palaearctic and therefore has significance at the regional level within Europe.
- The values of the property are at a lower level than existing comparable World Heritage properties globally, and also lower than the recent inscriptions of regional comparators.
- Existing listed properties are in general larger and with greater species diversity or numbers than the nominated property.
- There are a number of other properties which, whilst with significant differences to the existing properties, have broadly similar values.
- The values of the property are similar to a property that the Committee has previously decided not to inscribe.

IUCN concludes that comparative analysis indicates that the values of the nominated property do not make a compelling case for Outstanding Universal Value in relation to natural criteria.

4. INTEGRITY

4.1. Protection

LPNP was designated as a Nature Park in 1990 by Official Gazette 11/90. Subsequent regional conflict prevented the organisation and installation of the park authority until 1998. Aside from national recognition, LPNP, as part of the Central Sava Basin, was recognised as an Important Bird Area (IBA) in 1989 and became a Ramsar site in 1993.

LPNP is managed by the Nature Park Public Service which represents the field authority of the Nature Conservation Directorate, a department of the Ministry of Culture. Forests, pastureland and arable land are 100% state owned, whilst farmland is 100% privately owned.

At the moment, the nominated property encloses two ornithological reserves of 455 ha in total. All other territory is managed for agriculture, forestry and other uses in different levels of intensity in accordance with the actual legal status. However, strict forest reserves and the adaptation of forest management to natural processes would be required to provide a necessary level of protection of its natural values, and the present level of protection is therefore not sufficient for the protection of the area as a natural landscape. The assessment of the status of the property in relation to cultural values will be carried out by ICOMOS. IUCN considers the protection status of the nominated property does not meet the requirements set out in the *Operational Guidelines*, in relation ro natural values.

4.2 Boundaries

The nominated property forms a band of about 25 km in length and 3 km in breadth and is located between Zagreb-Nova Gradiska motorway in the north and the Sava River in the south. In the north, the property borders either the motorway itself or farmland. In the south, the river of Sava forms the boundary on most of its length. The buffer zone varies in its width between 0.5 km in the north and 7 kilometres in the northwest. In the north and the south, the boundaries of the buffer zone follow the natural boundaries of the Sava basin till the ascent of the surrounding hills. There is no buffer zone to the property where it adjoins Bosnia and Herzegovina.

The boundaries of LPNP do not follow ecological needs. Riparian hardwood forests are found in significant parts of the buffer zone as well as the nominated property. The boundaries of the nominated property include only the left river bank. The river itself and the right river bank are not included. An assessment of the boundaries in relation to cultural values will be considered by ICOMOS.

IUCN considers that the boundaries of the nominated property do not meet the requirements set out in the *Operational Guidelines*, in relation to natural values.

4.3 Management

The management plan for LPNP was under preparation at the time of the evaluation mission and was anticipated to be completed in the beginning of 2009. It covers a period of 10 years and will be periodically renewed. An annual plan of work will be established by the park authority under the umbrella of the management plan including preservation, research and monitoring, surveillance, education and training as well as promotion and use.

The staff of LPNP consists of 14 people, of which 11 are engaged permanently and three temporarily. The current actual budget equates to c. USD 650,000, of which 94% comes from the state. Local involvement is achieved by a Stakeholder Committee founded in

2004 and including the most relevant interest groups within the reserve. The main tasks of the Committee are cooperation with other stakeholders and the park authority and participation in management and conservation activities.

The park authority has a surveillance function and cooperates with other authorities and organisations to ensure that objectives and regulations are followed. Management in the field is undertaken by several other state authorities and organisations. The efforts undertaken by the park authority are strongly supported by the Public Forest Service and achieved a halt to plans which would affect the natural flooding system of the property.

Exploitation of forests continues in a way which does not support natural ecological processes of riparian forests. Only small reserve areas exist within the nominated property and in the buffer zone. Parts of the forests are not accessible due to danger of land mines from the Civil War and have remained free from any exploitation activities since that time. Current forest management practices, including clear cuttings (or canopy cuttings as they are called by the Forest Service) impact on the natural processes and dynamics of the property. Hunting is also present and is managed within 14 hunts, of which two are leased to local hunting associations. The remaining 12 hunts are managed over concessions given out by the Ministry of Agriculture, Forestry and Water Management. Thus, whilst the management of the property is appropriate and effective in relation to the values of the property as a managed and used landscape with high natural values, it is not appropriate for a natural World Heritage property. IUCN considers the management of the nominated property does not meet the conditions of integrity set out in the *Operational Guidelines,* in relation to natural values.

4.4 Threats

4.4.1 Settlements

Fourteen rural settlements are found within the boundaries of the nominated property but outside of riparian hardwood forests. The total number of inhabitants living within the property was 4,370 in 2001.

4.4.2 Water management

Regular flooding is the dominant factor of riparian forests. The riparian forests of LPNP are regularly flooded following the natural inundation cycle. According to the reported observations of park managers, the property has become drier in recent years. Cooperation between Croatian Waters and the management of LPNP functions in a way that is appropriate for preservation of natural values of the property. There are potential plans for new engineering works from different authorities and organisations which could affect the integrity of the nominated property and/or its buffer zone, including some discussion of plans to straighten and deepen the River Sava, although no firm projects at this stage.

4.4.3 Pollution

Several sources of pollution are located in the buffer zone, sometimes close to the boundaries of the nominated property. Water quality is also reported to be affected by untreated urban and only partially treated industrial effluent. A phosphorus-gypsum dump near Kutina at the northern boundary of the property is also a threat to the property. The dump of about 100 ha consists of two basins which are separated from the property by the Zagreb-Belgrade motorway. Intensive agriculture in the buffer zone and within the property around Jasenovac creates a pollution load from pesticides and fertilizers. However, overall the impacts on the natural values of the property are limited.

4.4.4 Invasive alien species

False indigo, originally from North America, has become widespread in lowlands of southern and central Europe along banks of rivers and lakes. Its fruit are disseminated by flood waters and can now be found in many forests and grazing lands of the nominated property. False indigo is currently found on about 5,800 ha or 11.4% of the total area of the property.

4.4.5 Residual impacts of conflict

Significant parts of the nominated property and the buffer zone were frontline areas during recent regional conflict. As a consequence, extensive areas were mined and, forest areas in particular, remain inaccessible because mines are still present. Whilst this makes exploitation activities impossible it is also an impact on its natural values and accessibility to those values.

In summary, IUCN considers the nominated property does not meet the conditions of integrity in relation to the requirements for a natural property.

5. ADDITIONAL COMMENTS

5.1 Management of natural values alongside human use

IUCN notes a number of points in relation to the natural values of the property, in the context of its

values as a used and managed landscape:

- A range of areas with similar values to the nominated property are located outside its boundaries on the right river bank of Sava and/ or are located within the buffer zone including the forests of Zelenik, Odranske Poly and Turo Polje.
- Forest management could be better adapted to natural processes of riparian hardwood forests, through ceasing clear cuttings and the designation of forest reserves.
- Water management is a key issue to support the natural processes of flooding that are critical to the maintenance of the values of the property.

6. APPLICATION OF CRITERIA

Lonjsko Polje has been nominated as a mixed property under natural criteria (ix) and (x), together with two cultural criteria which will be considered by ICOMOS. IUCN's evaluation in relation to the natural criteria is as follows:

Criterion (ix): Ecological and biological processes

The assemblage of alluvial hardwood forests and the system of wetlands present in the property are notable on a regional basis in Europe and the Western Palaearctic. However, other existing World Heritage properties offer more extensive wetlands in the region or comparable forest values. The nominated property's forests, while retaining a significant number of species, include few undisturbed areas and do not meet the conditions of integrity for a natural property nominated for its ecosystem processes. The protection status and management of LPNP is also not compatible with the integrity requirements for a natural property.

IUCN considers the nominated property does not meet this criterion

Criterion (x): Biodiversity and threatened species

The nominated property includes nationally and regionally significant levels of biodiversity, including 550 plant species, 250 bird species and 58 species of mammals. Information on species diversity of LPNP is incomplete, however, known species diversity and numbers are considered typical for protected areas in the region, and are not at the levels of comparable properties inscribed on the World Heritage List.

Kopacki-Rit, a Croatian site nearby, has similar values and shows higher bird diversity. This property was nominated in 1999 under the same two criteria. The World Heritage Committee decided not to inscribe this property in 2009 and this is a key precedent in the assessment of the present nomination. The property does not meet the relevant conditions of integrity in relation to the requirements for a natural property.

IUCN considers the nominated property does not meet this criterion.

7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopt the following draft decision:

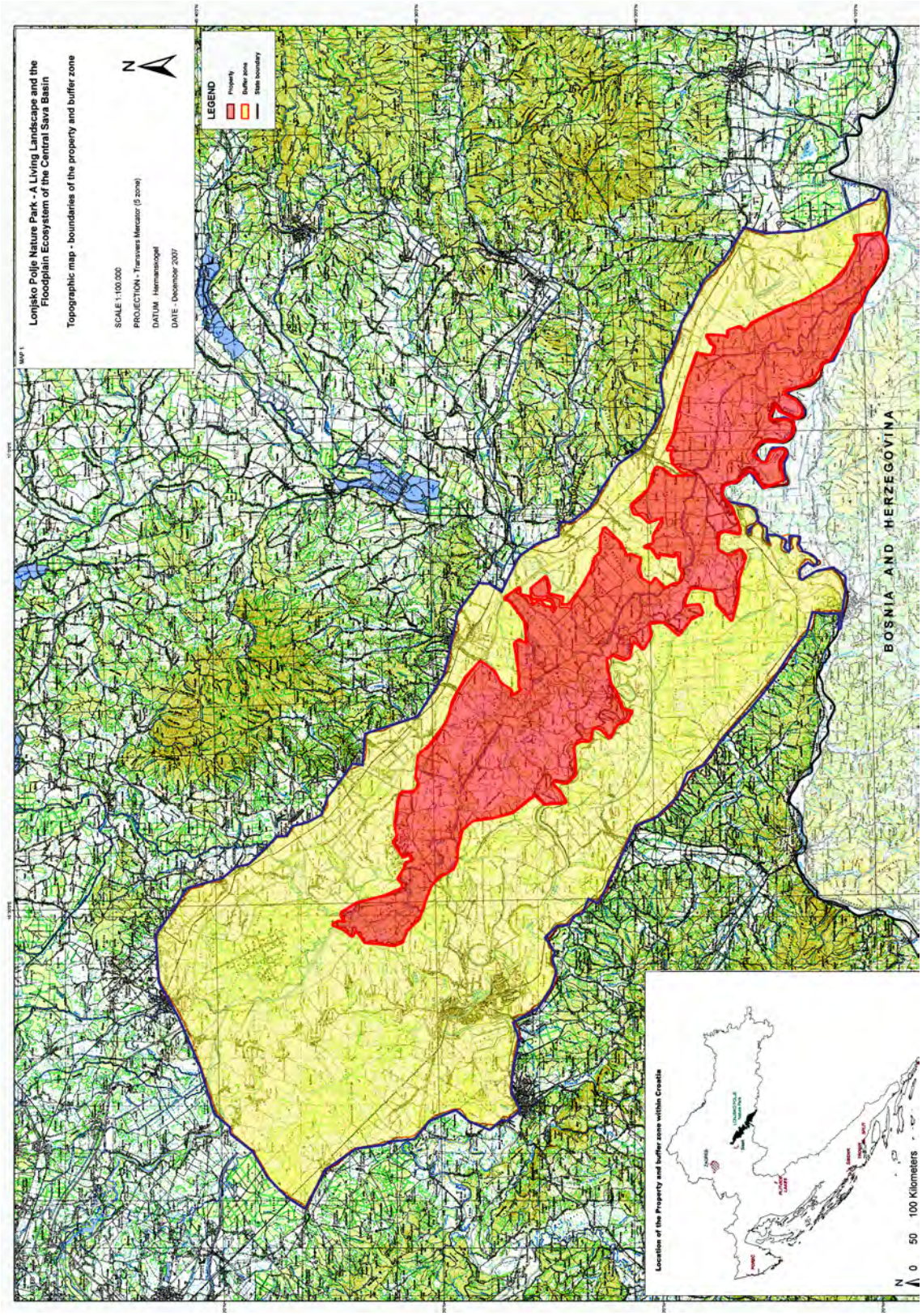
The World Heritage Committee,

1. Having examined Documents WHC-09/33. COM/8B and WHC-09/33.COM/INF.8B2,

2. Decides not to inscribe **Lonjsko Polje Nature Park – A Living Landscape and the Floodplain Ecosystem of the Central Sava Basin, Croatia,** on the World Heritage List on the basis of natural criteria;

3. Commends the State Party for the retention of natural flooding processes within the property, which should continue to form a critical issue in the long term management of the property, including through management of the property in the context of the Ramsar Convention.

Map 1: General location of nominated property, boundaries and buffer zone



Europe / North America

Cultural Landscape Orheuil Vechi

Republic of Moldova

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

CULTURAL LANDSCAPE ORHEUIL VECHI (REPUBLIC OF MOLDOVA) ID No. 1307

1. DOCUMENTATION

i) Date nomination received by IUCN: 15th March 2008.

ii) Additional information officially requested from and provided by the State Party: No supplementary information was requested by IUCN.

iii) Additional Literature Consulted: Williams, P. (2008) **World Heritage Caves and Karst.** IUCN, Gland. 34pp.; Badman, T. and Bomhard, B. (2008) **World Heritage and Protected Areas: 2008 Edition.** IUCN, Gland. 19pp.; www.iucnredlist.org;

iv) Consultations: 3 external reviews. The mission met a range of representatives of national ministries, national experts, and stakeholder groups from local authorities, local scientists and the site management authorities, as well as representatives of the National Commission for UNESCO, and members of the press.

v) Field Visit: Pierre Galland with Luisa de Marco (ICOMOS).

vii) Date of IUCN approval of this report: 27th April 2009.

2. SUMMARY OF NATURAL VALUES

The Cultural Landscape Orheiul Vechi is nominated as a mixed property under one cultural and one natural criteria. The nomination also considers the values of the property as a cultural landscape. This evaluation report by IUCN addresses the natural values of the property, and the cultural values will be considered by ICOMOS.

The Cultural Landscape Orheiul Vechi is situated on the river Răut, a tributary of river Nistru. The nominated property is located in the central part of the Republic of Moldova, 50 km north-east of the capital of the country, Chişinău. It comprises an area of 4,472 ha and is surrounded by a buffer zone of 2,451 ha which is not part of the nominated property. The nominated property is located on the eastern edge of the Moldavian Plateau, an area of predominantly calcareous geology dating from the Tertiary, with overlying Quaternary sediments. It includes a picturesque part of the river containing three meanders (named *Mihăilaşa, Peştera and Butuceni*) located in a relatively shallow and open gorge of around 100-130m in depth.

The natural values of the property emphasized in the nomination are the landscape of the gorge and the river, and the associated geology and biodiversity. The nominated property is a lived-in, pastoral landscape which includes three agricultural villages, T*rebujeni*, *Butuceni* and *Morovaia*, with a total population of 2,112 people and an additional population estimated at 500 people in the buffer zone. Agriculture is generally low intensity and based on traditional practices that have replaced collective farming. It is common to see horse carts and animal powered ploughing.

The earth science values of the nominated property include fossil remains in the geological sequence, caves and local scale karst features. The agricultural and riverine areas also support a variety of flora and fauna, an estimated 11% of which are endangered species within Moldova, and include regionally endemic species, although no species that are endemic to the nominated property alone. The area has been intensively studied and comprehensive lists of species and habitats are available. The nominated property also includes areas of grazed steppe grasslands, river and wetland habitats, rocky habitats and semi-natural woodland which is dominated by secondary regrowth of oak.

The nomination emphasizes the importance of the geographical setting of the nominated property as an intersection of communication and a variety of cultural influences. Its natural values are also emphasized throughout the nomination document in relation to their contribution to a cultural landscape. The nomination of a mixed property and the cultural values are given significant prominence in the nomination, which notes values including the archaeological evidence from Paleolithic and Neolithic settlements, and a series of more recent phases of settlement and use. Rock-carved monasteries were also carved in the cliff areas. ICOMOS is responsible for the evaluation of these features in relation to the relevant cultural

criteria. IUCN and ICOMOS have exchanged views during the evaluation process to ensure coordination in their recommendations to the World Heritage Committee.

3. COMPARISONS WITH OTHER AREAS

The nomination includes a section on comparative analysis that is primarily based on web research. IUCN notes that the sites selected for comparison in the nomination are often not very closely related to the values of the nominated property, whilst a number of other properties and areas were not selected for comparison.

In relation to the presence of natural features that could be considered to the application of criterion vii, IUCN notes that the values displayed are of national or possibly sub-regional significance. The scale of the landscape does not approach that of the large scale and extensive features of properties that have been recognised under this criterion, being of a relatively modest scale. In relation to nearby listed World Heritage properties, the canyon and the karstic elements do not sustain the comparison with listed World Heritage properties such as Durmitor (Montenegro) or Škocjan Caves (Slovenia). Looking globally, the scale of natural phenomena in many karst properties, and other properties related to riverine landscapes, including the Three Parallel Rivers of Yunnan Protected Areas (China), South China Karst (China), Grand Canyon National Park (USA), Lake Baikal (Russian Federation), Canaima National Park (Venezuala) or the Tsingy de Bemaraha Strict Nature Reserve (Madagascar), are of higher significance.

Size and scale are also relevant comparative measures in relation to the application of criterion vii. At a landscape scale, the nominated property is noted to be small in relation to the typical size of natural World Heritage properties. It can be noted that there are similar landscapes in many parts of the world that are not inscribed on the World Heritage List in relation to their natural values, such as the Cévennes (France), the Jura (France and Switzerland). Similar landscapes are also seen on the Dniestr (Nistru) River in Western Ukraine. The nominated property is not referred to as of potential global significance in the recent IUCN thematic study on World Heritage Caves and Karst.

Natural values within the landscape of the nominated property include those related to geological values, and these are considered to be significant at the local-national region but typical for the region. The biodiversity values are also significant at the national level. However comparative analysis clearly indicates that the natural values of the property do not provide a basis for the recognition of Outstanding Universal Value in relation to natural criteria.

4. INTEGRITY

4.1 Protection

The nominated property includes land in public, private and communal ownership, and also areas in the ownership of voluntary organizations. The nomination notes that there has been a gradual process of parceling of the lands and their passing into private ownership resulting in an increase in traditional farming. The nominated property is classified as a State Historical-Cultural and Natural-Landscape Reservation, which was created according to decision of the Council of Ministers of Moldova in 1968. There are a number of other sources of legal protection for the nominated property based in land-use planning laws, also set out in the nomination. However, based on discussions during the evaluation mission, it was evident that there is still a lack of integrated instruments to ensure the effective protection of the nominated property as a whole. The mission understood that a new draft law on creation of the Historical-cultural and Nature-landscape Reserve “Orcheiul Vechi” would shortly be presented for the 2nd reading to the parliament of Moldova. If approved this law will be a considerable improvement to the current situation where a range of different laws are in place. IUCN noted that the legal process for this new law is driven by the Ministry of Culture and that coordination with other ministries appeared to require strengthening.

The protection regime in place appears to have a range of the right elements in relation to a system for protection of a lived-in landscape, dominated by human uses. However the level of protection in the context of a landscape significantly modified by agriculture, human settlement and forestry throughout most of area, may not be adequate to maintain natural values. Thus the status for maintaining the integrity is not adequate for a property that is being proposed for recognition as a natural World Heritage property. IUCN notes that ICOMOS will evaluate the status of the nominated property in relation to the protection of cultural values.

IUCN considers the protection status of the nominated property does not meet the requirements set out in the *Operational Guidelines*, in relation to natural values.

4.2 Boundaries

The boundaries of the nominated property enclose a relatively small area, but appear to be logical and coherent territory in relation to the natural values displayed, encompassing the river, its valley and the surrounding landscape. The buffer zone has been designed taking into account national legislation regarding protected areas, which prescribe a 0.5 – 2 km widths for such zones. This regulation could

potentially be able to buffer the natural values of the nominated property from a number of external threats. However in practice the design of the buffer zone bisects some municipality and village boundaries, and in the view of IUCN it should be adapted to include whole local communities and villages to enhance its effectiveness. This would ensure greater coherence regarding sustainable use and development, and the interactions with local people. IUCN notes that ICOMOS will evaluate the boundaries of the nominated property in relation to cultural values.

IUCN considers that the boundaries of the nominated property meet the requirements set out in the *Operational Guidelines*, in relation to natural values.

4.3 Management

The principal management responsibilities in relation to the nominated property lie with Museum Complex of Orheiul Vechi, which has the principal responsibilities for the management of the archaeological sites. The museum is well maintained and displays the cultural values of the nominated property; however it is lightly staffed in relation to field activities. Local public authorities also have an important responsibility in relation to the regulation of land use and land management. A range of national authorities also have regulatory and policy related roles.

Management planning documents are in place, including the *Management plan for the Cultural Landscape Orheiul Vechi for the years 2008-2020,* which outlines 64 programmes related to the nominated property. Despite the presence of the planning documents, the evaluation mission noted that there is not yet an overall integrated management system for the nominated property. The site managers are dedicated and motivated regarding conservation management, but have much less capacity regarding issues such as tourism, agriculture and sustainable development.

There is a lack of a joint vision about the future of the site, including agricultural development scenarios, and rural tourism development. Rural tourism is already providing a good income to a few local entrepreneurs, and thus consideration of this aspect will become an increasingly pressing issue. Several options for creating an effective overall management system for the nominated property were discussed during the evaluation mission, and it was noted that the scientific community has a great interest in participating in the management efforts.

IUCN noted as a result of the evaluation mission a range of management challenges regarding the current and future management of the cultural landscape values, but this will be discussed in the ICOMOS evaluation report.

IUCN considers that the management of the nominated property does not meet the requirements set out in the *Operational Guidelines*, in relation to natural values. Continued efforts are required to establish and implement an overall management system, including the need for a considerable strengthening of the management capacity to address the likely future conservation and development challenges facing the nominated property.

4.4 Threats

Pressures from human use are considered to be the most significant source of threats to the nominated property, and the nomination notes that these pressures have had a negative influence on the values of the property over the last 40 years. Activities in the villages, the growth in population within the region and agriculture are noted as the main drivers of these pressures at the present time. The nomination notes a number of threats that are relevant to the natural values of the nominated property including the following:

4.4.1 Development pressures

The direct impacts of development pressures, such as construction of buildings and changes in land use are noted as primarily being of concern in relation to their impacts on the nominated cultural values, although they clearly are also important pressures in relation to the natural values of the nominated property. The nomination notes that there is some pressure for clay and sand extraction within the boundary of the property, whilst mining is noted as a pressure from outside its boundaries, with possible impacts on hydrology. A further pressure is the reported extraction of decorative stone from areas of limestone, although the scale of this is not clearly assessed in the nomination.

4.4.2 Grazing

Human use is ubiquitous in the steppe and wetland ecological niches which are used for agricultural activities, including the grazing of domestic animals and gathering of hay. A number or relict species of flora are under pressure as a result, so careful management of grazing pressure appears essential to retain a balance between use and the conservation of biodiversity values.

4.4.3 Environmental pollution

Pollution is noted in the nomination as a pressure resulting from municipal and construction waste. The nomination notes that there is a lack of specific place for waste management and of municipal policies for waste management resulting in some dumping on the banks of the river and elsewhere. Agriculture is noted as a further source of pollution and nutrients which affect the natural systems. Two localities are noted which have a high level of chemical pollution in the nominated property, whilst some pollution

through human settlements is also noted.

4.4.4 Natural disasters
Orheiul Vechi is located in an area that is prone to earthquakes, which whilst not a direct threat to the natural values of the nominated property are a concern regarding the safety of local populations. There are also potential hazards from landslides, flooding, fire and other sources which are similarly of concern. In order to diminish the negative effects of potential natural catastrophes, there is some disaster risk planning in place, under the competence of the magistrate of the commune of Trebujeni and the museum of Orheiul Vechi.

4.4 Visitor and Tourism pressures

An important pressure on the nominated property comes from visitors and tourists, whose numbers have grown considerably during the last 10 years and will continue to grow. Visitor numbers are currently estimated at 45,000 per annum. The threats include potential impacts in relation to infrastructure, pollution and the quality of experience of the landscape. Management of visitor use is a critical area where capacity is required within the management authorities for the nominated property, and in the future planning. The nomination suggests disturbance from visitors is a concern in relation to the populations of birds of prey that use the limestone areas.

In summary, IUCN notes that the threats to the nominated property in relation to natural values are long-standing. As the property is a lived-in pastoral landscape, and has been inhabited and farmed for centuries then its ecosystems and natural values have been heavily and extensively modified by human use. There are nevertheless some notable natural values within the property for which protection and management should be considered as part of the integrated management of the cultural landscape within the property, and with regard to the management of the wider buffer zone and surrounding areas. Greater management capacity and stronger planning is required to achieve this. IUCN notes that an overall assessment of the protection and management of the cultural values of the property, including in relation to cultural landscape aspects, will be considered by ICOMOS.

In summary, IUCN considers the nominated property does not meet the conditions of integrity as outlined in the *Operational Guidelines*, in relation to natural values.

5. ADDITIONAL COMMENTS

None

6. APPLICATION OF CRITERIA

The **Cultural Landscape Orheuil Vechi** has been nominated under natural criterion (vii), together with one cultural criterion. The application of the cultural criterion will be evaluated by ICOMOS.

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

The nominated property displays aesthetic values that are nationally significant within Moldova. These comprise the landforms of a meandering river system, and associated geological and biological diversity. The natural values are present in a landscape setting that has been extensively and permanently modified by human use over hundreds of years. The natural values of the property are notable at the national level but are equalled or surpassed by many other similar sites around the world. They are of considerably less significance than those displayed in existing World Heritage properties listed under natural criteria. The nominated property does not meet the conditions of integrity for a natural World Heritage property. IUCN considers that the nominated property does not meet this criterion.

IUCN commends the State Party for their wish to protect the Cultural Landscape Orheiul Vechi, and considers that the State Party should evaluate the means to strengthen the national level of protection of the property, and enhance the conservation and management of its natural values as part of an integrated conservation strategy for the wider landscape of the property.

7. RECOMMENDATION

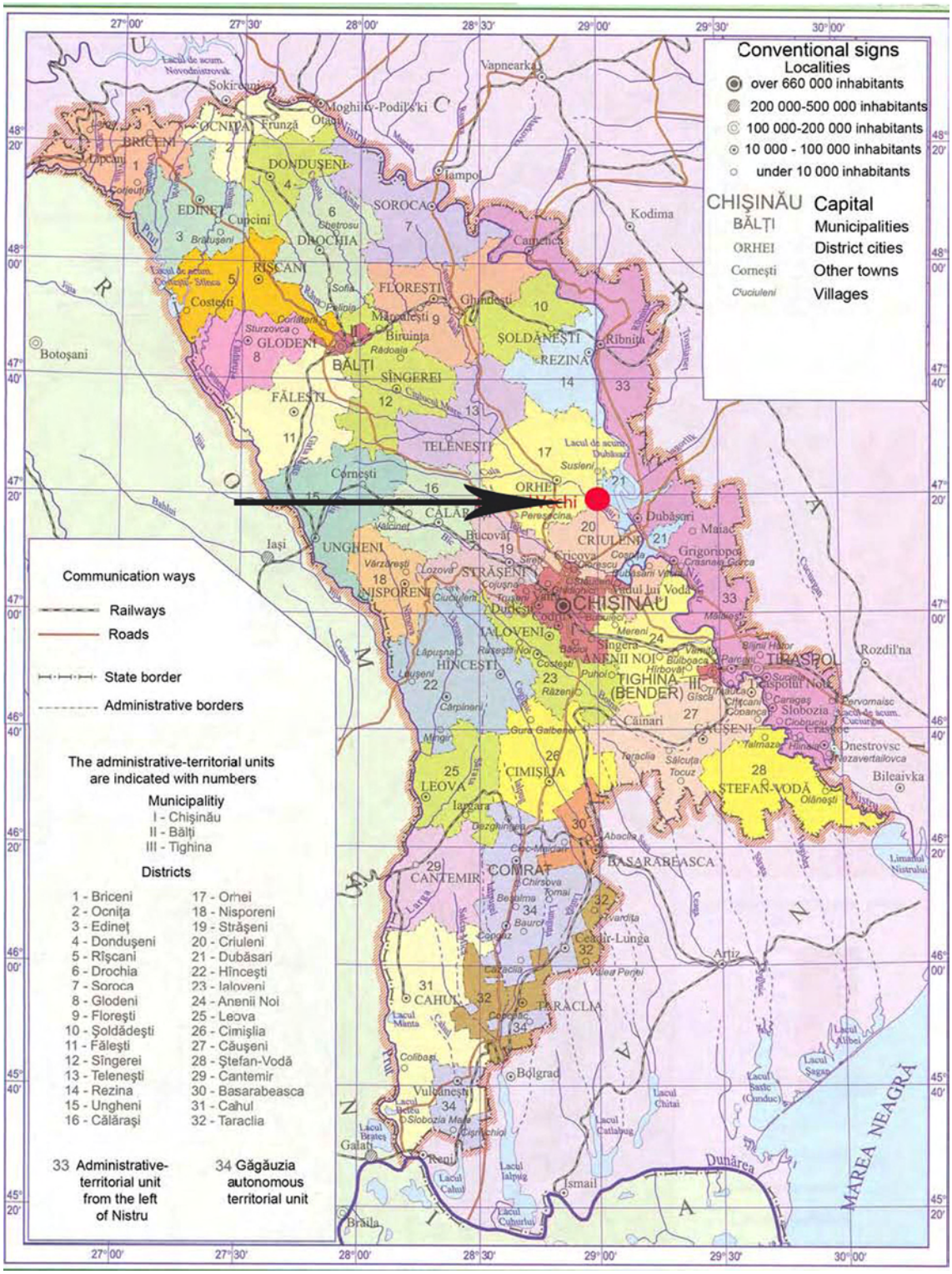
IUCN recommends the World Heritage Committee adopt the following draft decision:

The World Heritage Committee,

1. Having examined Documents WHC-09/33.COM/8B and WHC-09/33.COM/INF.8B2,

2. Decides not to inscribe **The Cultural Landscape Orheiul Vechi, Moldova** on the World Heritage List under natural criteria.

Map 1: General location of nominated property



Map 2: Nominated property and proposed buffer zones.

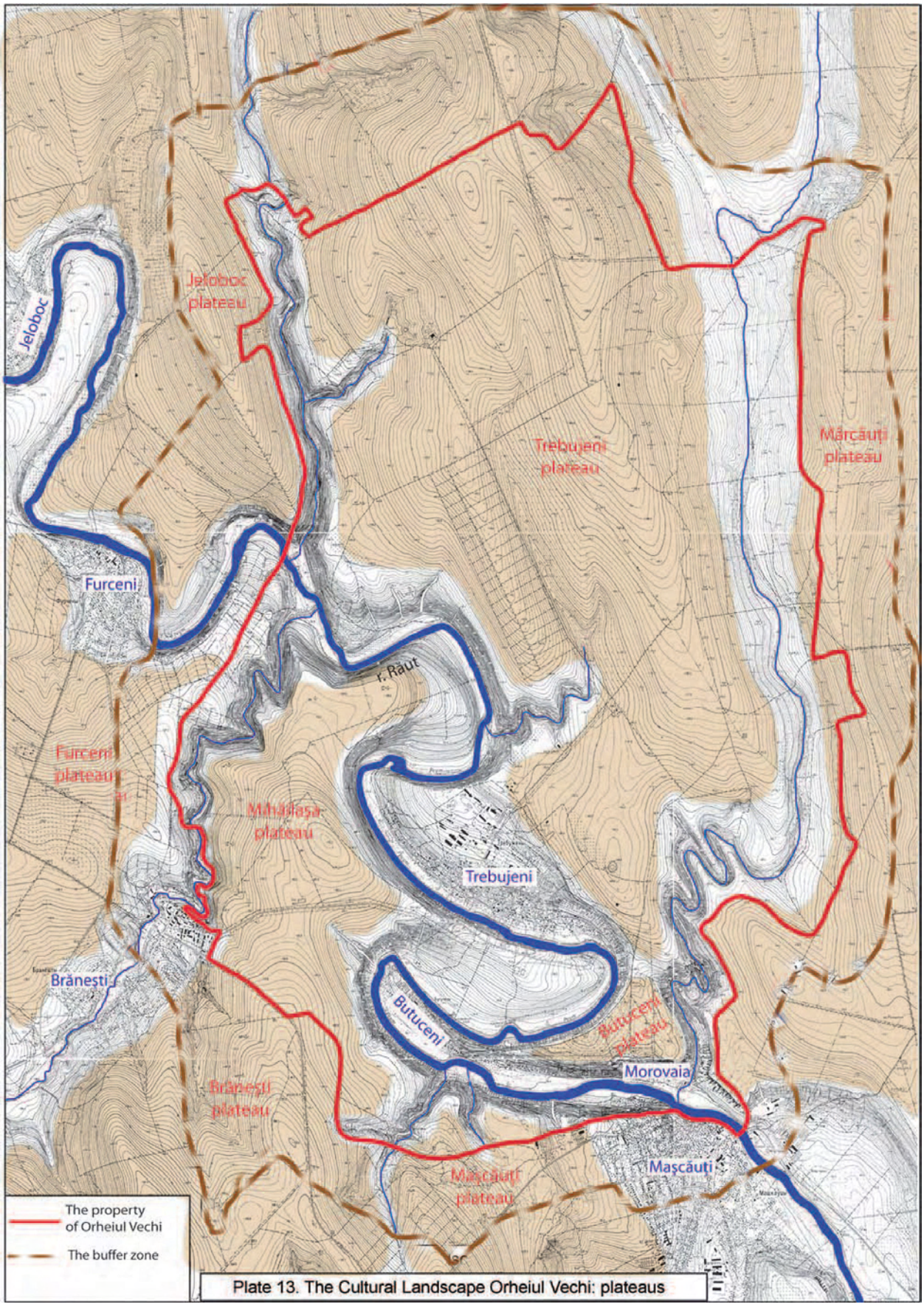


Plate 13. The Cultural Landscape Orheiul Vechi: plateaus

B2 Boundary Modifications of Mixed Properties

Europe / North America

Natural and Cultural Heritage of the Ohrid Region

(proposed minor boundary modification)

Former Yugoslav Republic of Macedonia

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

NATURAL AND CULTURAL HERITAGE OF THE OHRID REGION (THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA) – ID No. 99

IUCN carried out a desk review of the proposed modification to the boundary of the Natural and Cultural Heritage of the Ohrid Region (The Former Yugoslav Republic of Macedonia) taking into consideration comments from three external reviewers.

1. BACKGROUND INFORMATION

The property was inscribed on the World Heritage List in 1979 under natural criterion (vii). The property was extended in 1980 and cultural criteria (i), (iii) and (iv) were added: thus the property which was initially inscribed as a natural property is now inscribed as a mixed property. No buffer zone was identified at the time of the original inscription or the renomination.

At its 32nd Session (Québec City, 2008), the World Heritage Committee considered a proposal from the State Party for a reduction in the surface area of the property. Following evaluation, ICOMOS considered that this minor boundary modification was acceptable, but IUCN did not consider that it was justified without further consideration. The World Heritage Committee decided in decision 32 COM 8B.49 to refer the minor boundary modification back to the State Party for reconsideration. Following the IUCN evaluation, the Committee requested the State Party to consider realigning the boundary of the property, preferably along topographic or other features recognisable in the field, to include all of Galičica National Park and other critical areas, and to create an appropriate buffer zone to protect the catchment of Lake Ohrid.

The State Party submitted a revised proposal for a minor boundary modification to the World Heritage Centre in January 2009, which was received by IUCN on 9th February 2009. The new proposal included a revised topographic map showing the boundaries of the World Heritage property and the proposed modification, together with a range of supplementary information and an explanatory letter. However a number of points were not clear from this revised submission, including that no information was provided on the surface area change entailed by the proposed modification. IUCN transmitted a number of questions where additional information was required from the State Party to the World Heritage Centre on 19th February 2009.

On 11th March 2009, the World Heritage Centre wrote to the State Party to request supplementary information in relation to IUCN's request, and further information was received from the State Party and transmitted to IUCN on 7th April 2009. This information clarified the explanation of the justification for the proposed modification, included improved maps and provided additional information on the natural values within the proposed area to be added to the property.

This process illustrates that there are a number of points regarding the process of consideration of minor boundary modifications which could be improved. These issues should partly be addressed by the adoption of a revised and standard format for the submission of information in support of a minor boundary modification. This has been prepared by the World Heritage Centre in conjunction with the Advisory Bodies, and it is proposed that this will be included as a new annex to the *Operational Guidelines*. IUCN considers that the provisions of paragraph 148(h) of the *Operational Guidelines* should be strictly applied in the case of evaluations of new nominations and extensions, however there is a need to consider the correct process in relation to the submission of minor boundary modifications, to ensure that there is opportunity for some dialogue with the State Party in cases where the initial submission is not clear. This is necessary in order to avoid repeated and unnecessary referral of such proposals. IUCN is grateful for the rapid response of the State Party to the eventual request for supplementary information in this case.

2. SHORT SUMMARY OF PROPOSAL

In its revised proposal the State Party again proposes to reduce the overall terrestrial surface area of the property along the northern, north-western and north-eastern boundary of the property. However unlike the previous submission the proposal includes the addition of areas, including parts of Galičica National Park along the south-eastern boundary of the property (where previously small extensions and reductions were proposed). The revised proposal will still retain a boundary that cuts through Galičica National Park, although the level of this issue is reduced, and it also appears to create a boundary that is better related to natural features. As with the previous proposal, no changes are proposed to the section of the boundary that cuts through the middle of Lake Ohrid,

which coincides with the border between the Former Yugoslav Republic of Macedonia and Albania. The proposal does not appear to consider the need for a buffer zone for the property.

The proposal will result, according to the supplementary information provided by the State Party, in a change of area from 84,040 ha for the currently inscribed property, to 83,350 ha for the area enclosed by the proposed modified boundary. This represents a small overall reduction in size of the property (in relation to its natural values) of 690 ha or c.0.8%, a figure that is much less than the estimated reduction proposed in the previous suggested modification.

3. IMPLICATIONS FOR OUTSTANDING UNIVERSAL VALUE AND INTEGRITY

The State Party suggests that the addition to the boundary in the south and east sides contributes to the protection of biodiversity and geodiversity in this region, including in relation to values for flora, karst and glacial features. A short summary of key biological values in the area to be added to the property is annexed to the supplementary information provided by the State Party and makes reference to values recognised in national and international systems for assessing conservation priorities. The State Party also asserts that there are no areas of significant natural values in the areas proposed for exclusion from the property in its northern part. Based on input from reviewers, IUCN considers that the extension would appear to enhance slightly the natural values of the property, and unlike in the previous proposal, there is a compensation for reduction in the exclusion of areas to the north of the property by the addition of areas that lie within Galičica National Park. The fact that the additional areas are already within the competence of the National Park also suggests that there will be no impact regarding the manageability of the property. Thus taken on its own terms, IUCN considers that the proposed extension has a neutral to slightly positive impact on the Outstanding Universal Value and Integrity of the existing inscribed property, in relation to natural values.

The proposal does not make a significant contribution to addressing the wider integrity issues related to the property. In its technical evaluation of the property in 1979, IUCN noted concerns that the original boundary of the property does not meet the conditions of integrity required of natural World Heritage properties, as only the Macedonian (former Yugoslav) part of Lake Ohrid and a small part of its watershed are included. The proposed revised boundary does not address these issues. The significant concern remains that the World Heritage property only covers the Macedonian part of Lake Ohrid, missing out on the Albanian part. Nor does the proposal consider the buffering of the property, including the related hydrological links in the subterranean karst systems.

The State Party does, however, report a number of points of progress in regard to these broader issues. A negotiation procedure between the parties has been initiated at the fourth regular meeting of the Bilateral Ohrid Lake Committee, and a bilateral meeting was scheduled between the respective Ministries of Environment for 6 February 2009 in Ohrid. The State Party indicates its willingness to give full support, including expert and technical support, to the preparation of the file for the Albanian part to be included in the World Heritage List. IUCN is also ready to provide advice to assist this process if required.

The State Party notes the preparation of a Management Plan for the Natural and Cultural Heritage of Ohrid Region has been initiated, through a workshop held in Ohrid in October 2008. In the 44th Session of the Government of the Republic of Macedonia held on 2 January 2009, an action plan for the preparation of this plan was defined, and the competent ministries have been requested to establish working teams for the preparation of the management plan. It is anticipated that a draft version of the Management Plan will be prepared and submitted to the World Heritage Centre and the Advisory Bodies for review by the end of 2009, and prior to its adoption.

Finally, the State Party requested assistance in legal aspects of the protection of the property. IUCN was pleased to put the State Party in contact with an expert on protected areas law within the IUCN Commission on Environmental Law to assist their consideration of the relevant issues.

In summary, IUCN does not consider that the proposed modification addresses the long standing issues relating to the integrity of the property in relation to natural values. However as the proposal appears to have a neutral or slightly positive impact on the natural values and integrity of the property, IUCN therefore considers that the boundary modification can be approved, on the assumption that ICOMOS remain supportive in relation to cultural aspects of the property. However, IUCN continues to encourage the States Parties of the Former Yugoslav Republic of Macedonia and Albania to consider a new nomination for a transboundary extension of the property to include the Albanian part of Lake Ohrid and its watershed, in order to strengthen the values and integrity of the property. In this regard the continued dialogue between the two relevant States Parties is be welcomed. It is also positive that the management plan for the property is being reviewed.

4. RECOMMENDATION

IUCN recommends that the World Heritage Committee adopt the following decision:

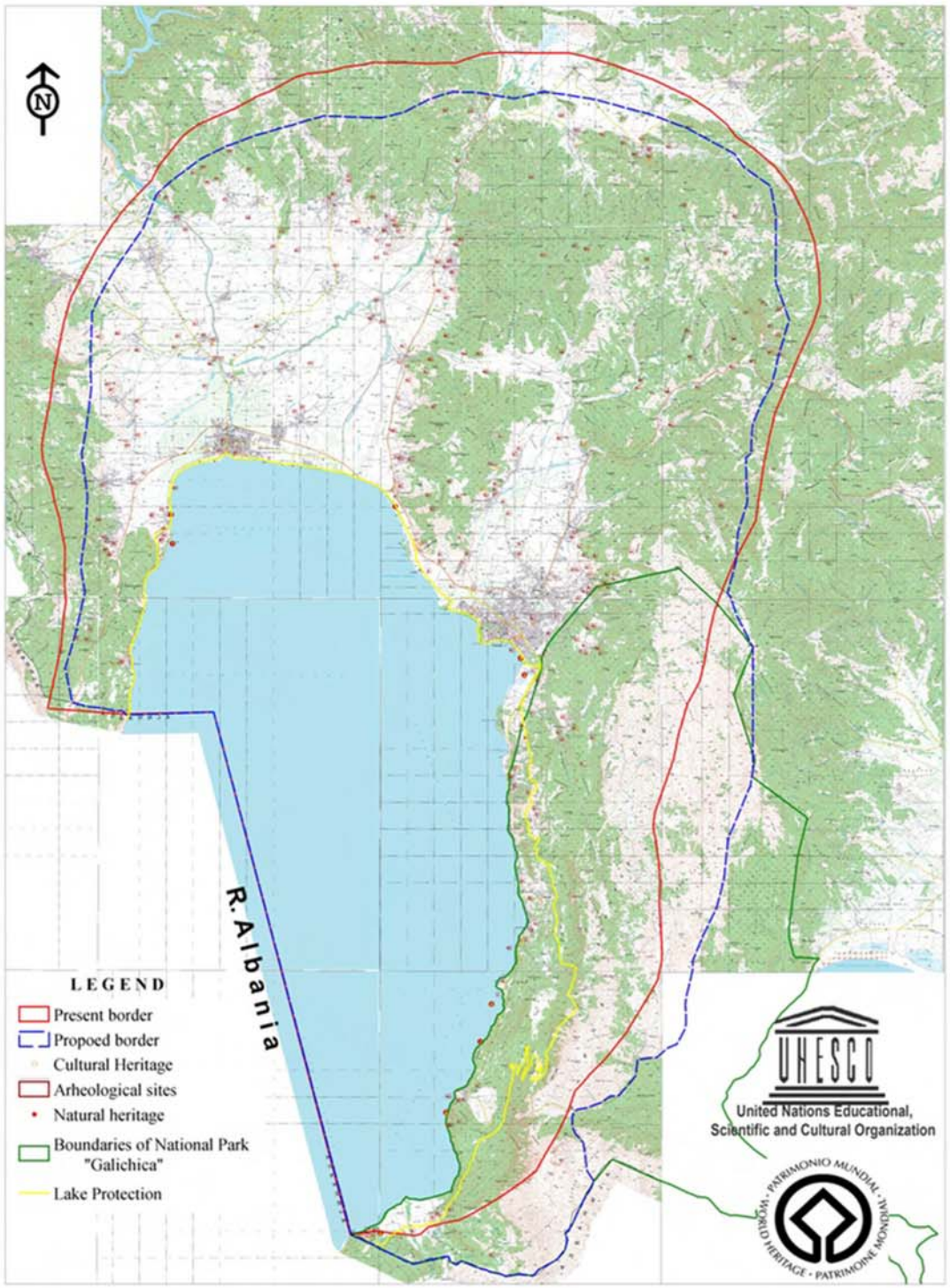
The World Heritage Committee,

1. Having examined Documents WHC-09/33.COM/8B, WHC-09/33.COM/INF.8B1 and WHC-09/33.COM/INF.8B2,

2. Approves the proposed modification to the boundary of the **Natural and Cultural Heritage of the Ohrid Region, Former Yugoslav Republic of Macedonia**;

3. Encourages the States Parties of the Former Yugoslav Republic of Macedonia and Albania to cooperate towards the preparation of a new nomination for a transboundary extension of the property, to include the Albanian part of Lake Ohrid and its watershed, in order to strengthen the values and integrity of the property.

Map 1: Existing and proposed boundaries of property.



C1 New Nominations of Cultural Landscapes

Europe / North America

Farms and Villages in Hälsingland

Sweden

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

FARMS AND VILLAGES IN HÄLSINGLAND (SWEDEN) ID Nº 1282

IUCN carried out a desk review of this cultural landscape nominated under cultural criteria (iv), and (v) and provided the following comments to ICOMOS as an input to the evaluation process.

1. COMBINED WORK OF MAN AND NATURE

This nomination focuses on the structures and buildings of the farms and villages of Hälsingland, but provides little justification for inscription as a cultural landscape, and what distinguishes the nominated property as a "combined work of man and nature". The nomination document notes that the agricultural landscape is a product of sustained interaction between nature and culture, but does not address its key components, or the dynamic formative nomination processes. It does address, however, the factors that are key to landscape maintenance. Little consideration seems to have been given to the conservation of agro biodiversity within the farming systems to develop and/or conserve a range of varieties of domesticated livestock and cultivated crops.

2. MANAGEMENT

The management section of the nomination focuses on the built environment and gives less attention to the rural land use systems, which are considered buffer zones. Emphasis is placed on general policies and planning, but is less specific on actual management processes and implementation. While monitoring is addressed, little relates to rural land use. Mechanisms for the coordinated management of all elements of the nominated property are lacking.

3. RECOMMENDATIONS TO ICOMOS

The property is nominated as a cultural landscape under cultural criteria and it is the responsibility of ICOMOS to recommend whether or not the nominated property is of Outstanding Universal Value. IUCN finds that on the basis of this desk review of the nomination document that the case has not been made why the nominated property should be regarded as a cultural landscape in relation to the expectations of the *Operational Guidelines*.

Latin America /Caribbean

The Gold Route in Paraty and its Landscape

Brazil

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

THE GOLD ROUTE IN PARATY AND ITS LANDSCAPE (BRAZIL) ID Nº 1308

IUCN carried out a desk review of this cultural landscape nominated under cultural criteria (ii), (iv), and (v) and provided the following comments to ICOMOS as an input to the evaluation process.

1. COMBINED WORK OF MAN AND NATURE

The nomination document does not provide a clear rationale for nomination of this property as a "combined work of man and nature", which is the unifying concept of a cultural landscape as defined within the *Operational Guidelines* to the World Heritage Convention. The nomination is based on three specific cultural features in the Municipality of Paraty related to an 800 km long gold route, and recognizes that these features are situated within a notable surrounding landscape. There is little focus on the manifestations of the interaction between humankind and its natural environment that are central to recognition of the values of a cultural landscape.

At present, the overall logic of the nomination is not clear and not well articulated. The gold route is presented as an important element of a resource use system that characterized a particular period of human history in South America. This 800 km. route connected the port of Paraty to the gold fields of Ouro Preto (an existing World Heritage property). There is no explanation of why only three features in Paraty and 1% of the route are nominated from this much longer and diverse gold route system.

A revised new nomination could focus on the natural and cultural features of the Paraty region. The evidence presented in the nomination document suggests there may be values that should be considered in relation to the natural World Heritage criteria as well as the cultural World Heritage criteria already put forward in the nomination. This would have to be evaluated more closely based on a new nomination, but the fact that such a diverse assemblage of features exists in one area is unusual. IUCN therefore considers that the natural values of the area, including their potential to support a possible nomination as a mixed property or as a cultural landscape with high natural values, warrants further examination.

2. MANAGEMENT

The nominated property consists of an 8.7 km section of the gold route, the historic centre of Paraty, and the Defensor Perpetuo Fort. The surrounding natural landscape within the buffer zone of the nominated property is managed by a variety of local, state, and federal agencies to meet conservation objectives that are compatible with, but not dependent on, the management of the property as currently nominated. The buffer zone areas proposed include areas that are recognised as UNESCO Man and Biosphere Reserves.

3. RECOMMENDATIONS

The property is nominated as a cultural landscape under cultural criteria and it is the responsibility of ICOMOS to recommend whether or not the nominated property is of Outstanding Universal Value. On the basis of its review of the nomination, IUCN suggests that ICOMOS may wish to consider requesting further information from the State Party to address the points outlined above, including in relation to the evident high natural values in the buffer zone of the nominated property.