



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

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United Nations
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Cultural Organization



World Heritage Convention

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

2010

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THE WORLD HERITAGE CONVENTION

IUCN TECHNICAL EVALUATION REPORT OF WORLD HERITAGE NOMINATIONS

May 2010

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) and the World Heritage Programme of IUCN (International Union for Conservation of Nature). In close cooperation with PPA and other units of IUCN both at headquarters and in the field the World Heritage Programme 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) ensuring the highest standards of quality control and institutional memory in relation to technical evaluation, monitoring and other associated activities;
- (ii) increasing the use of specialist networks of IUCN, especially WCPA, but also other relevant IUCN Commissions and specialist networks;
- (iii) working 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) increasing 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 more than 1400 protected area managers and specialists from 140 countries. In addition, the World Heritage Programme 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, non-governmental organizations 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. The IUCN programmes on World Heritage and Protected Areas then prepare 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 2009 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 enhanced the coordination of their panel processes as requested by the World Heritage Committee.

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 World Heritage website.

Further to progress reported on the implementation of the review's recommendations in 2009, IUCN has continued to progress in the implementation of all proposed recommendations. In 2009-10 the regional representation and gender balance of the selected evaluators and on the IUCN World Heritage Panel have been further enhanced. IUCN has invested significantly since 2007 with its own resources in strengthening its work on World Heritage, with a strong financial contribution towards the position of head of the newly created World Heritage Programme. 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 March or April and the submission of the IUCN evaluation report to the World Heritage Centre in May of the following year. The process outlined at the end of this introduction 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. IUCN received more than 200 external reviews in relation to the properties examined in 2009 / 2010.
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 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 on this criterion. In addition, global classification systems and priority-setting exercises, 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 provide useful guidance. The decisive 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) selected 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 World Heritage Programme, Chair
- The Head of the IUCN Programme on Protected Areas
- Other senior staff of the Programme on Protected Areas
- The IUCN 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 2010 this included regional representatives from Africa, Asia and the Pacific, with specialist areas of expertise in relation to earth science, biodiversity and ecosystem conservation and protected areas.

The Panel's preparations and its meetings are facilitated through the work of the World Heritage Project Management 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, 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 2009 / 2010

17 nomination dossiers and 3 minor boundary modifications were examined by IUCN in the 2009 / 2010 cycle, involving 9 field missions. These comprised:

- 8 natural property nominations (including 4 new nominations, 2 deferred nominations and 2 extensions),
- 2 mixed property nominations (2 new nominations), where joint missions were undertaken with ICOMOS,
- 1 renomination of a natural property under cultural criteria, where a joint mission was undertaken with ICOMOS
- 6 cultural landscape nominations (5 new nominations, 1 extension), for one of which a joint mission was undertaken with ICOMOS, 4 were commented on by IUCN based on internal and external desktop reviews and two were not commented on,
- 3 minor boundary modifications.

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, almost 30 of the approximately 200 external reviews in 2009 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. Theme studies on caves and karst and volcanoes were completed in 2008 and 2009, respectively, and a study on deserts is in its final stage. 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.

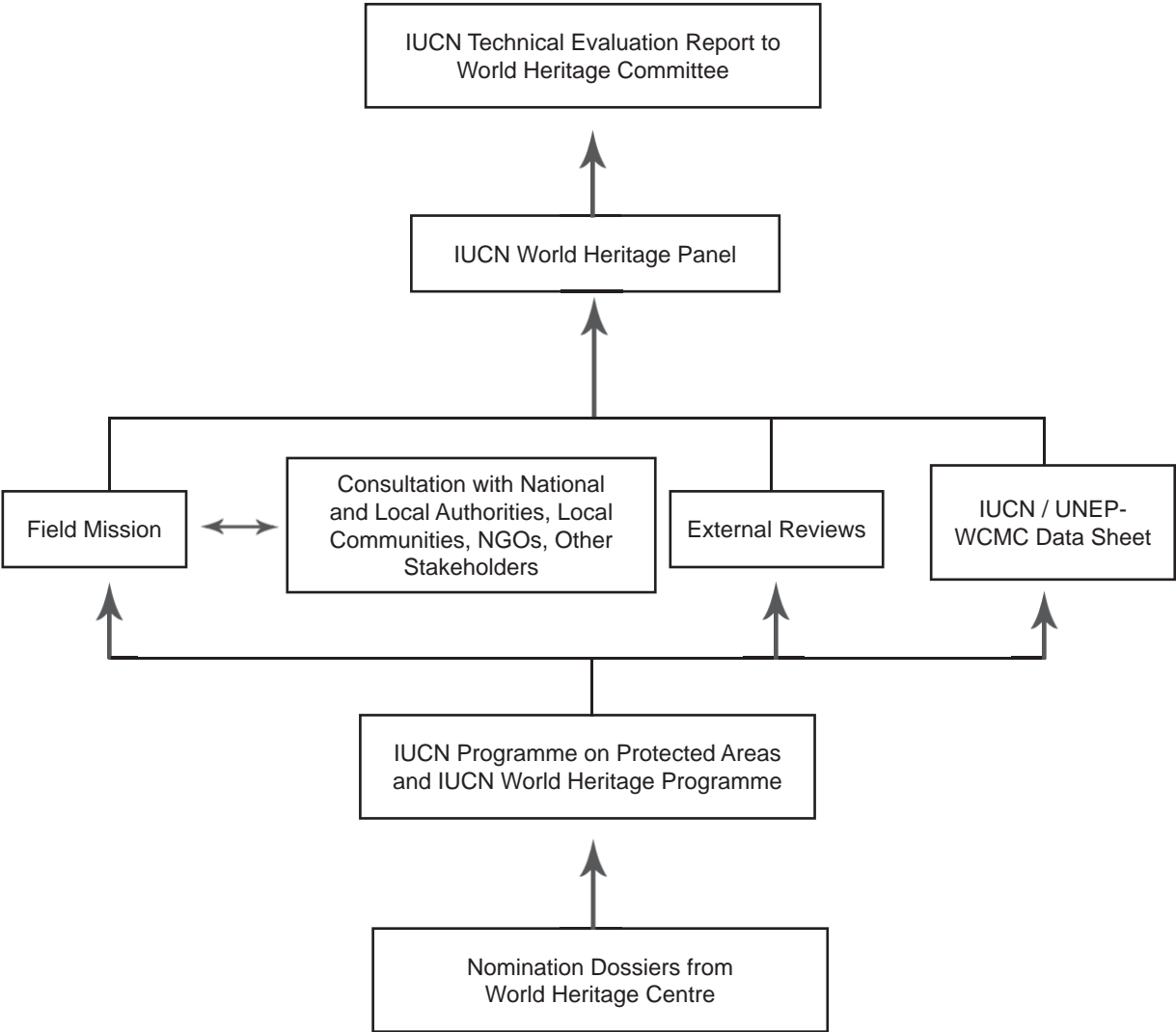
7. RECOMMENDATIONS TO THE WORLD HERITAGE COMMITTEE

In the 2009 / 2010 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 2010, 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 members, 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



A. Natural Properties

A1 New Nominations of Natural Properties

ASIA / PACIFIC

CHINA DANXIA

CHINA



WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

CHINA DANXIA (CHINA) - ID N° 1335

1. DOCUMENTATION

- i) **Date nomination received by IUCN:** 15th March 2009
- ii) **Additional information requested:** IUCN requested supplementary information after the mission regarding a range of issues related to the scientific framework for China Danxia, site selection, comparative analysis, integrity, protection and management of the property and the protection of wider catchments. A response to all questions raised was provided by the State Party.
- iii) **UNEP-WCMC data sheet:** Sourced from original nomination.
- iv) **Additional literature consulted:** Engels, B., Ohnesorge and Burmester, A. (eds) (2009) **Nominations and Management of Serial Natural World Heritage Properties, Present situation, Challenges and Opportunities.** Federal Agency for Nature Conservation, Bonn; Guizhou Institute of Architectural Design (2008) **Chishui of China Danxia Management Plan.** Guizhou Tongh Co Ltd on Planning and Consultation, Chishui; Grimes, K., Wray, R., Spate, A. and Household, I. (2009) **Karst and Pseudokarst in Northern Australia.** draft report to the Commonwealth of Australia Department of Environment, Water, Heritage and the Arts; **Optimal Karst Management.** Hall; Lockwood, M., Worboys, G.L. and Kothari, A. (2006); **Protected Area Management, A Global Guide.** IUCN and Earthscan, London; Longhushan-Guifeng National Park Heritage Coordination Committee (2008) **Protection and Management Plan for Longhushan World Natural Heritage Nominated Site 2008-2012.** Longhushan-Guifeng National Park Yingtan City and Shangrao City Jiangxi Province; OCWHN [Office of China World Heritage Nomination] (2009) **Joint Management Plan of China Danxia.** Office of China Danxia World Heritage Nomination, Changsha City, China; Ro, L. and Chen, H. (2009a) **Guangdong, Management Planning.** Planning and Research Institute Sun Yat-sen University, Danxiashan National Park; The Administrative Committee of Langshan National Park (2008) **The Management Plan of Langshan Nominated Site.** Xinning County, Shaoyang City, Hunnan Province; The People's Government of Taining County (2009) **Taining World Natural Heritage Nominated Site Protection and Management Plan.** Taining County, Sanming City, Fujian Province; Young, R.W., Wray, R.A.L. and Young, A.R.M. (2009) **Sandstone Landforms;** Cambridge University Press, Melbourne.
- v) **Consultations:** 15 external reviewers. The mission met a wide range of officials, community representatives, experts and from the State Party and the six provinces whose territory is included in the nomination, together with representatives of stakeholders and local communities.
- vi) **Field visit:** Graeme Worboys and Kyung Sik Woo, September-October 2009.
- vii) **Date of IUCN approval of this report:** 30th April 2010.

2. SUMMARY OF NATURAL VALUES

The nominated property, China Danxia is a serial World Heritage nomination comprising six areas found in the sub-tropical zone of SW China. The six areas are located in six different provinces within a c.1700 km crescent shaped arc from Chishui (Guizhou Province) in the west to Jiangliangshan (Zhejiang Province) in the east. Three of these areas consist of a single component with a single buffer zone, and three consist of two component parts with a single shared buffer zone. The total area of the nominated property is 82,151 ha, and additional 136,206 ha is included in the buffer

zones. Table 1 summarises the names and sizes of the six areas, the component parts and buffer zones, and also provides an indicative statement for lands which are either national park or national nature reserve.

China Danxia is stated as the name given in China to landscapes developed on continental red terrigenous sedimentary beds influenced by endogenous forces (including uplift) and exogenous forces (including weathering and erosion). It is characterised by spectacular red cliffs and a range of erosional landforms, including dramatic natural pillars, towers, ravines, valleys and waterfalls. The

Table 1: Areas, component parts and buffer zones of the nominated property.

Area	Area (ha)	Status	Buffer zone (ha)	Buffer zone status
Chishui	27,364	Two component parts: 1) part of Chishui National Park; and, 2) part of Chishui Alsophila National Nature Reserve; and, part of Xishui Central Subtropical Evergreen-Broadleaved Forest National Nature Reserve.	44,814	The buffer zone interconnects the two components 1) State land (the largest category); 2) Xishui Central Subtropical Evergreen-broadleaved Forest National Nature Reserve; 3) Chishui Alsophila National Nature Reserve; and 4) Chishui National Park.
Taining	11,087	Two component parts: 1) northern part of Taining National Park plus Geopark lands and 2) part of the southern part of Taining National Park plus National Forest Park land.	12,401	The buffer zone interconnects the two components and comprises parts of Taining National Park and National Forest Park Lands and Global Geopark lands.
Langshan	6,600	Predominantly within Langshan National Park, with some parts in State land.	6,200	The buffer zone is found within parts of Langshan National Park and State land.
Danxiashan	16,800	Located entirely within Danxiashan National Park	12,400	The buffer zone is located entirely within Danxiashan National Park.
Longhushan	19,690	Two component parts: Longhushan Section and Guifeng Section, both are within Longhushan-Guifeng National Park.	59,820	The buffer zone interconnects the two nominated areas and comprises part of Guifeng National Park, part Geopark Land and State land.
Jianglangshan	610	Recognised as Jianglangshan Scenic Spot.	571	The buffer zone surrounds the nominated area. Its status is assumed to be part of the Jianglangshan Scenic Spot.
Total	82,151		136,206	

process of its development is characterised by a particular rock sequence, tectonic background, climatic conditions, erosional processes and landforms and these processes have been presented as an interim model.

The geographical location of the Chishui area belongs to a transition zone between the Sichuan Basin and the Yungui Plateau, while the other areas are all located in the Jiangnan hill region of South China, distributed on both sides along the main ridge of Nanling Mountain and Mt. Wuyishan. All of these mountains are within an uplift zone which has been active since the Cenozoic, and this dynamic tectonic environment is a key factor in Danxia development. The nominated areas are all located on the South China plate. During the Middle Jurassic to Early Cretaceous extension in the southern part of the South China plate formed a series of extension fault basins allowing deposition of thick continental sequences of alluvial, fluvial and lacustrine sediments. The thickness and uniformity of the terrestrial basin sediments was a key factor for Danxia formation processes. In addition, due to the arid to semiarid Cretaceous climate in China, most of the sediments are red in colour. With the onset of the Himalayan mountain forming movements in

the early Neogene, the red bed basins experienced large scale and differential uplift. Climatic factors (especially rainfall) is a further critical factor in Danxia formation, influenced by China's South Asia subtropical humid monsoon climate during the recent geological past. High seasonal variations in river flows are experienced during the summer monsoon rainy seasons. The Chishui, Langshan and Longhushan Danxia sites are within the Yangtze river catchment, while Danxiashan, Taining and Jianglangshan sites belong to the Zhuajiang, Minjiang and Qiantangjiang river catchments.

Due to the combined endogenic (tectonic uplift) and exogenic (climatic, erosion, weathering) forces, and other factors the Danxia landforms have been developed in red sedimentary sequences continuously from the Neogene until the present. The six areas included in the nomination are stated in the nomination to represent the best examples of "least eroded" to "most eroded" Danxia landforms, providing a range of different aspects of the phenomenon, illustrating both the range of landforms in relation to the forces and processes that formed them. These sites have been classified in the nomination from "young" through "mature" to "old age". China Danxia is also noted as a natural

aesthetic landscape comprising red rocks, green vegetation, blue water and white clouds, whilst a range of cultural aesthetic associations are also noted.

The rugged landscapes in the nominated property has helped to conserve sub-tropical broad leaved evergreen forests and these forests are found within all six serial sites. A range of important micro-habitats are also found. The nature of the Danxia landforms lead to intensive fragmentation and isolation of ravine and mountain top habitats. The natural habitats host many species of flora and fauna including endemic, endangered and threatened species of conservation significance. They also include old and undisturbed vegetation communities. Species recorded within the property, and its buffer zone, are stated to include 5,772 higher plants (belonging to 293 families and 1,271 genera); 836 vertebrates, (129 families and 37 orders) and 3,073 insects. Around 400 species in the property are stated to be rare or threatened at the national or international level.

3. COMPARISON WITH OTHER AREAS

The nomination contains a comparative analysis which has been reviewed by IUCN, and has also been considered further by the State Party during the evaluation process. The process of developing a satisfactory comparative analysis is somewhat difficult as there is still considerable debate about the science of Danxia and even how the phenomenon is defined and described. A major conference on this subject was held in China in 2009, but after the nomination had been submitted.

IUCN requested supplementary information from the State Party to clarify these issues. In a detailed set of statements this information notes that Danxia refers to geological, biological and aesthetic factors, and that so far there is not a well recognised international geological and geomorphological definition of Danxia, the State Party suggests that it refers to “the physical landscape developed from continental (terrestrial) reddish conglomerate and sandstone (also known as red-beds)”. Additional definitions are provided, which also emphasise the importance of uplift and the influence of warm, humid monsoon climate. A series of quite subtle discussions are included regarding frames of reference for comparison, and a number of difficulties are noted re both the lack of adequate global knowledge, and it is said that “although the comparative analysis may not be definitive, there is sufficient information to know that [China Danxia] is a remarkable and unique geomorphological system that is of special note because it shows through a sequence of separate sites all of the variations of its formation”. The statement thus makes a virtue of having the different parts of the series telling a

whole story, and a parallel is drawn with the South China Karst in the area being a superlative example of how landscapes develop in red beds. It also emphasizes that China Danxia is distinguished by humidity from “dry Danxia” developed in deserts. A new conceptual model is proposed in the comparative analysis, which has been put forward for peer review, and appears to have a reasonable level of support. The six selected areas are considered representative of different stages in the evolution of the landform, and a useful diagram is provided to explain the connection between the different components.

IUCN considers it problematic that China Danxia does not yet have an internationally accepted definition and that the State Party considers even the revised comparative analysis is not definitive. IUCN also notes that developing conceptual models for serial nominations after their nomination, rather than prior to it, is a problematic practice. It makes it very difficult to both achieve overall comparison of the resulting property, and also the selection of appropriate component parts. The presentation of the Danxia phenomenon is more fully explained in the supplementary information and the conceptual model that has been developed may well lead to a better comprehension of the phenomenon, but neither is fully agreed or reviewed in international literature, and since this information was offered at a late stage in the evaluation, it has not been fully validated. Although IUCN accepts the understanding of terms in the model, it notes there are some shortcomings. For instance it does not seem relevant whether the rocks are terrestrial or marine in origin, but rather that they are relatively unresistant and unfolded. The statement that Danxia is unique is not fully justified, as for example the “ruined cities” of Northern Australia and butte landscapes of the Western USA also display features that are comparable with China Danxia. A stated claim that there being nowhere else that tells the story of tectonism and denudation is not accepted. Review comments suggest that, whilst there is considerable and growing interest in China Danxia, it is difficult to substantiate a case that the evolution of China Danxia landforms is any different to general evolution of sandstone/conglomerate landforms elsewhere in the world. IUCN notes that the International Association of Geomorphologists has recently established an expert working group on China Danxia, which provides the opportunity to consider further the appropriate scientific framework for recognising this phenomenon.

In aesthetic terms it is considered that China Danxia landforms are often arresting, inspiring and beautiful, but so are many sandstone landscapes and landforms in the world. Kakadu (Australia) is considered as a comparator for Danxia as described under criterion (vii), but with a much more extensive area. It is also noted that there are far more

extensive and dramatic areas of arid sandstone landscapes in the world, such as Canyonlands National Park (USA). IUCN considers that the comparative analysis at present is unconvincing, fundamentally because the concept of “China Danxia” has not yet been satisfactorily defined.

A further problem that is raised in this process is the selection of the component parts for the property. IUCN also requested supplementary information on this process. The State Party notes that a number of key factors for site selection were specified, and that the nomination is specifically focused on humid Danxia. At first 15 sites were selected, this was reduced to 9 and then 6 which were considered the minimum number to tell the Danxia story. This selection took place amongst 780 reported Danxia areas in China. The nomination is stated to show the distinctive character of each component and the information includes detailed tables, which summarise the stated natural values for each component.

IUCN considers that the key factors used for site selection have been carefully developed, and the process to select the sites is clearly explained and has been challenging. Nevertheless, there are points of concern regarding the outcomes of this selection process. It is surprising that the six areas selected are in six different provinces, and there is a need to exclude the possibility of political overlay to site selection. Lithological differences are also noted as a source of variation in Danxia that may not have been fully accounted for in the selection. Review comments consider that some of the landscapes chosen do not fit the stated model. Based on the model, Taining better represents early stage Danxia than Chishui, which is an area of largely fine grained rocks. The difference between Langshan and Danxiashan is not compelling, and the description of these components is very similar. Jianglangshan does not fit the old stage landscape shown in the diagram and model, as it rises from a hilly pedestal, not a base-levelled plain. Conversely, there is a consensus amongst reviewers that amongst the selected areas Langshan and Danxiashan demonstrate most clearly the features that are described as typical of China Danxia. Taining is also considered to be an important example by the majority of reviewers, whereas for the reasons mentioned above there is not consensus on the added value of the other components, or their coherence within the selected series.

Overall, there is considerable evidence from IUCN reviewers that there are significant natural values within the Danxia area that have sufficient specificity to have the potential to demonstrate Outstanding Universal Value in relation to earth heritage values. However, at this stage the nomination has not convincingly demonstrated

this, despite considerable discussion and invitation of supplementary information. There is a concern that the conceptual model developed after the submission of the nomination undermines rather than supports site selection.

IUCN carefully considered the biodiversity values included in the nomination, and in the wider region, in conjunction with UNEP-WCMC. IUCN notes that the nomination does not make a strong case for inscription under criterion (ix). The nominated components do not belong to Udvardy's South Chinese Rainforest biogeographic province as claimed by the nomination although there might be some “azonal” subtropical rainforests in the valleys of the property; instead the component parts belong to the Chinese Subtropical Forest (3 component parts: Taining North and South, and Danxiashan) and Oriental Deciduous Forest provinces. Both these provinces are already well represented on the World Heritage List: Mount Emei, Sichuan Giant Panda Sanctuaries and South China Karst are in the Chinese Subtropical Forest province, while Huanglong, Jiuzhaigou, Mount Huangshan, Mount Sanqingshan, Mount Taishan, Mount Wuyi and Wulingyuan are all in the Oriental Deciduous Forest province. With the exception of a small part of Ha Long Bay, Viet Nam, the South Chinese Rainforest province is so far not represented on the World Heritage List.

The case for inscription under criterion (x) appears stronger, but only in relation to the total species numbers provided in the nomination, although these numbers have not been fully verified. In terms of threatened and endemic species, the nominated property does not stand out compared to other existing inscribed properties. The species numbers provided in the nomination are not only for the nine component parts but for a much larger area which includes, for example, the buffer zones to the property. The nominated property has few globally threatened plant and animal species. The species numbers provided in the nomination also indicate that the nominated property has far fewer endemic species than for example the Three Parallel Rivers of Yunnan. The nominated property has a similar number of endemic animals and only twice as many endemic plant species as Mount Sanqingshan, which is four times smaller, much poorer in overall species richness and has not been accepted under biodiversity criteria. Considering levels of endemism relative to richness, Mount Sanqingshan appears to have higher levels of endemism than the nominated property (16% vs. 10% endemism in plants). Far higher levels of endemism can also be found in the Central Highlands of Sri Lanka, another nomination currently under evaluation by IUCN. IUCN also notes that the model and methodology for selecting the components of the series did not consider biodiversity values explicitly, thus the confidence in this selection is not high in relation to biodiversity

criteria. The high species numbers indicated in the wider region might indicate potential to identify a differently configured property that could have a stronger claim for Outstanding Universal Value than the nominated property.

4. INTEGRITY, PROTECTION AND MANAGEMENT

4.1 Protection

The nominated property is state owned and its protected status varies between the six nominated areas: most have national park status, though land status also includes national nature reserve, national forest, geopark, scenic area and state land. As noted in Table 1, not all of the nominated sites have 100% protected area status. The State Party has advised that unprotected areas will be protected by the expansion of National Parks status during 2010, and in supplementary information advised on the establishment of an ecological forest reserve in Taining and the expansion of the national park at Langshan. The protected status of the Jianglangshan Scenic Spot is less clear and it is recommended that this site be formally recognised as a protected area.

IUCN considers that, whilst it could be further strengthened, the protected status of the property meets the requirements set out in the Operational Guidelines.

4.2 Boundaries

The boundaries of the six nominated sites and their associated buffer zones were adequately defined on maps as well as on-site. The State Party has gone to a great deal of trouble to achieve this outcome. The boundaries of the property itself appear to be adequate in relation to the nominated earth science and aesthetic values, however are not adequate in relation to biodiversity criteria. The smaller component parts of the property do not appear to provide adequate habitat to sustain viable populations of all their key species, whilst connectivity is absent between the component parts of the property.

Buffer zone boundaries are also clearly defined, but do not fully protect the larger catchments which influence the different components. This question was addressed in supplementary information provided by the State Party. Management of catchment scale impacts is noted by the State Party as a critical problem across five of the six components. Information is provided on each component regarding the so called “area of influence” which is either the whole catchment (if small) or a management part of a catchment (for larger catchments). IUCN considers that this

response is encouraging but notes the very large scale of challenge in fully addressing catchment scale threats. Smaller catchments should be included in revised buffer zones.

IUCN considers that the boundaries of the nominated property do not meet the requirements set out in the Operational Guidelines with regard to biodiversity values, but would be adequate for protection of aesthetic and earth science values.

4.3 Management

Planning for the serial property is advanced. An integrated management plan has been prepared for the property as a whole, as well as individual plans for the six areas in the series. These plans identify a clear rationale for management and mechanisms for the protection of the potential World Heritage assets. For staffing and budgets, satisfactory on-ground management appears to have been established based on the briefings and information provided. Governance mechanisms for integrated management of the six areas have been identified, and clear accountabilities defined. Governance arrangements are in place and operating for individual sites. Monitoring for management has been introduced including visitor use, fire, water quality and weather. Cooperative arrangements with research organisations are in place to advise on the natural values of the property. There is good provision of staffing and management budgets.

IUCN was informed that more than USD200 million has been spent by the State Party, including the provincial authorities, over the past three years in preparing for the World Heritage nomination. Investments have been made in all nominated areas and include new visitor centres and administration buildings have been constructed, monitoring systems, visitor access and education facilities installed, infrastructure improvements, eyesore removal and a major public relations campaign regarding the nomination. Local communities are aware of the World Heritage nomination, and six interviews were conducted with villagers and locals during the IUCN evaluation. All stakeholders interviewed were very supportive of the World Heritage proposal.

Research and adaptive management techniques, including baseline condition assessment and monitoring of change for species are critical to track and avoid any possible adverse impacts from tourism and human use. Other management techniques such as environmental impact assessment; restoration management; and, management effectiveness evaluation need to be more actively and routinely used.

Active conservation management of the buffer zones and wider catchments is critical for the

protection of the property, especially its biodiversity values, viewsheds and the health of the wider ecosystems that support the property.

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

4.4 Threats

IUCN sought additional information regarding the threats to the integrity of the property. The resulting information provided by the State Party gives information for each component which are short but specific and indicate areas of intended improvement. The response indicates a mature understanding of conservation issues and requirements, and expands greatly on the information provided in the nomination. The State Party notes a number of points of overall concern mentioned in a number of the components of the property, which relate to intense and growing tourism pressure/overcrowding and deforestation around settled areas. Overall the level of management commitment appears adequate to the main challenges that could face the property, however continued vigilance and the maintenance of levels of staff and resources, up-to-date management plans and effective monitoring programmes are all essential. However, IUCN notes that one component, Longhushan, has a high population density and this component is much more modified than the other components. IUCN does not consider that this component of the property currently meets the expectations of integrity for a natural property.

Tourism is considered to be the greatest threat to the nominated property. This threat arises from possible tourism infrastructure development as well as from visitor overuse impacting landscape, aesthetics and biodiversity conservation values. As all of the six areas are relatively small, their natural values could easily be impacted by a growth in tourism use, and possible World Heritage status will potentially exacerbate this threat. The integrity of the property is also threatened by pollution of water courses, and thus integrity is dependent on the protection of streams and rivers with headwaters external to buffer zone areas. Effective implementation of protective measures at the catchment scale is likely to pose a major long-term challenge, and additional investments will be needed to help achieve responsible "off-site" protection for these upstream catchments.

In summary, IUCN considers that the property does not meet the integrity requirements set out in the Operational Guidelines.

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 nomination can be justified if no single area can recognize the full diversity of a phenomenon such as China Danxia. The successful nomination of the South China Karst provides an analogy to this approach. However, given the weaknesses in the current understanding of China Danxia, and the related comparative analysis, a full justification of the serial approach has not yet been established.

From a biodiversity perspective, the serial approach to this nomination does not appear to be justified, mainly as biodiversity factors were not an overt part of the selection of the components of the series, and the small size of many of the component parts casts doubt on the biological and ecological integrity and viability of the property.

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

Functional linkages between the nominated areas are related to their relationships in relation to the driving endogenetic and exogenetic factors that have led to the creation of Danxia landforms, however as noted above it is not clear that the component parts included in the nomination are all clearly linked to an established model for China Danxia, and some appear to not fit well with the model that has been proposed.

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

An integrated management framework has been developed to achieve the effective management of the six geographically disjunct serial sites.

5.2 Comments of ICOMOS

ICOMOS volunteered comments to IUCN on the cultural values of the property. ICOMOS noted that the justification put forward under criterion (vii) is very similar to the justification accepted for criterion (vi) for Mount Wutai, inscribed on the World Heritage List in 2009. ICOMOS notes the

care with which the State Party has integrated the cultural values of aesthetics and coexistence of humanity and nature in China Danxia into the nomination document. ICOMOS considers that the proposed justification for criterion (vii) in relation to Longhushan, in particular, goes far beyond the recognised use of this criterion for natural areas that are perceived to have natural beauty. The justification put forward is for cultural associations linked to religion and for cultural interventions in terms of rock caves, inscription etc. which more normally would be associated with criterion (vi) and other cultural criteria.

6. APPLICATION OF CRITERIA

China Danxia has been nominated under criteria (vii), (viii), (ix) and (x).

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

China Danxia is stated to demonstrate a consistent combination of natural features, which include prominent, sculpted and varied red Danxia landforms, sub-tropical broad leaved forests, blue waters of streams and the white of low clouds commonly found in the high humidity environment. Whilst individually a number of the component parts are highly attractive landscapes, and dramatic landforms, this is also true of a number of other sandstone landscapes globally. Comparative analysis has not provided compelling evidence to support a claim for outstanding universal value, and some stated human and cultural links are more relevant to consideration under cultural criteria. Not all of the components meet the integrity requirements expected for this criterion.

IUCN considers that the series as nominated does not meet this criterion, however it considers that there may be potential for a viable serial nomination of China Danxia, including some of the component in the present series under this criterion.

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

The phenomenon of China Danxia may have sufficient specificity to be recognised as of Outstanding Universal Value in relation to earth science values, but at present there is not a fully agreed definition for this phenomenon, and thus no adequate and definitive comparative analysis has been able to be completed. There are many sandstone landscapes that are of equivalent importance to the components included in the nominated property, including areas that are more extensive and natural, although mostly in arid areas. Whilst some components are accepted as classic examples of the geomorphology of the

Danxia region, others do not appear to fit in the conceptual model proposed in the nomination, thus the nominated series does not appear to correspond to integrity requirements in the Operational Guidelines.

IUCN considers that the series as nominated does not meet this criterion, however it considers that there may be potential for a viable serial nomination of China Danxia, including some of the component in the present series under this criterion.

Criterion (ix): Ecological processes

China Danxia includes nationally significant conservation samples of the sub tropical broadleaved evergreen forests of south China. The main biogeographic provinces represented in the property are already recognised on the World Heritage List, and the small size of the component parts and the wide separation between them does not correspond to the expected integrity requirements for a property recognised for ecosystem values. Ecosystem values were not a primary basis for the selection of the components of the series.

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

Criteria (x): Biodiversity and threatened species

Whilst the high species numbers indicated in the wider region indicate important biodiversity values in this region of China, the nominated property does not stand out compared to existing inscribed properties. The species and subspecies numbers provided in the nomination are not only for the nine component parts but for a much larger area which includes, for example, the buffer zones to the property. The biodiversity values included within the selected components are not outstanding compared to the values of already listed World Heritage properties. The model and methodology for selecting the components of the series did not consider biodiversity values explicitly, thus the selection of components does not seem secure in relation to this criterion, and a number of the components are too small to meet the integrity requirements for biodiversity values.

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

7. RECOMMENDATION

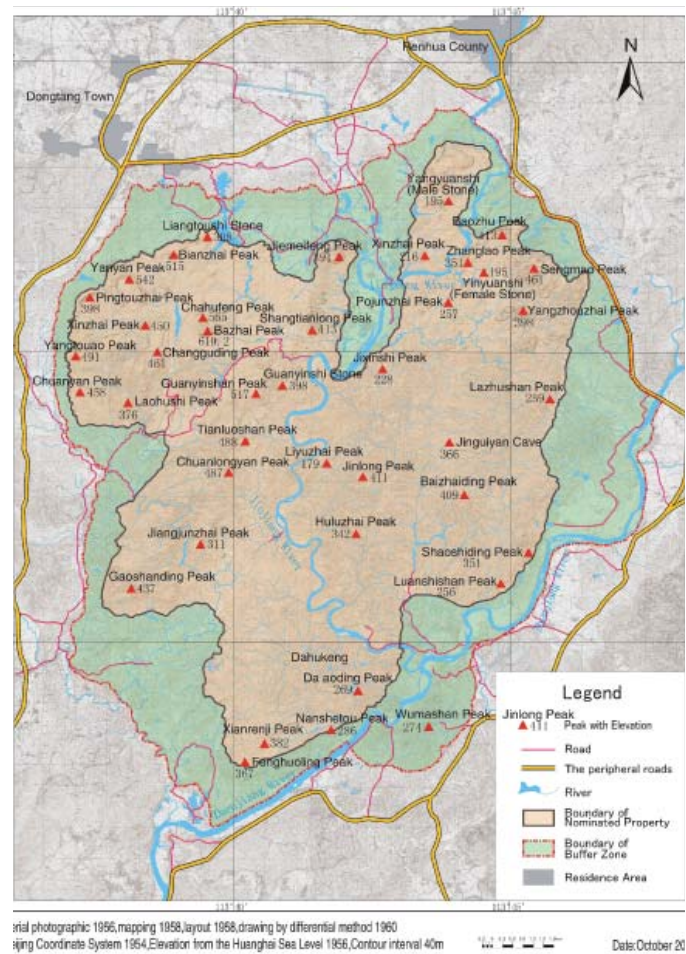
The World Heritage Committee.

1. Having examined Documents **WHC-10/34.COM/8B** and **WHC-10/34.COM/INF 8B2**,
2. Defers the nomination of **China Danxia, China** under natural criteria,
3. Invites the State Party, in reconsidering this nomination, to give particular consideration to refocusing the nomination on criteria (vii) and (viii), and before a resubmission to ensure there is an agreed scientific framework for the phenomenon of Danxia landscapes recognised at the international level, which can support a rigorous global comparative analysis of any revised nomination;
4. Recommends the State Party, in any revised nomination, to include a coherent selection of the minimum number of the most significant components to convey the values of China Danxia, to include a clear justification for the inclusion of each selected component part within the property and to ensure that all selected component parts meet integrity requirements for natural World Heritage properties, and that they and the series as a whole are effectively protected and managed, and supported by both adequate and effective buffer zones and the protection of wider catchment areas;
5. Further recommends the State Party to invite IUCN and the International Association of Geomorphologists to contribute to the reconsideration of the nomination, including in relation to the above recommendations;
6. Also recommends the State Party to further consider the representation, protection and effective management of the important biodiversity values of the area, in conjunction with the above process and also through other international mechanisms.

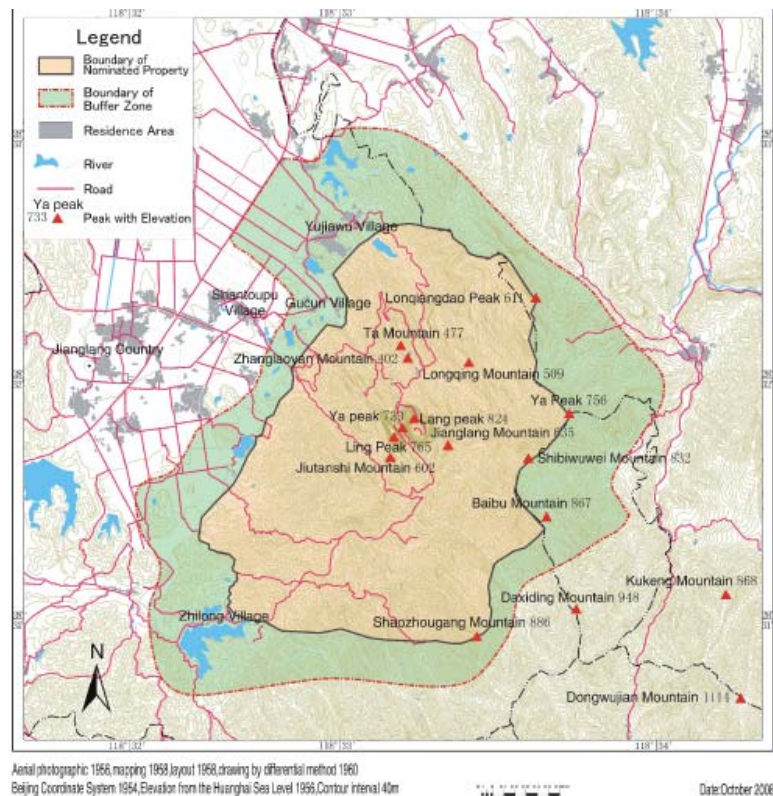
The map displays the People's Republic of China (PRC) and its neighboring countries. The PRC is shown in white, with its borders with other countries marked in red. The surrounding countries include Russia, Mongolia, Kazakhstan, Kyrgyzstan, Tajikistan, Nepal, India, Bhutan, Bangladesh, Myanmar, Laos, and Vietnam. The map also shows the PRC's maritime borders with North Korea, South Korea, and Japan. Major cities like Beijing, Shanghai, and Hong Kong are marked. The map includes a legend for political boundaries, water bodies, and elevation. An inset map shows the South China Sea islands.

The map displays the study area in the Hengduan Mountains, showing the distribution of 25 plant species. The map includes geographical features like the Chishui River, Fuyang River, and various towns. A legend identifies symbols for towns, villages, scenic spots, peaks with elevation, roads, and river boundaries. The map is divided into three color-coded regions: orange for the boundary of the nominated property, green for the boundary of the buffer zone, and grey for the residence area. The map also shows the distribution of 25 plant species, with their names and elevations (e.g., Qishuping 1277, Panlongjing 1201, Yanwozou 1405, etc.) marked on the map.

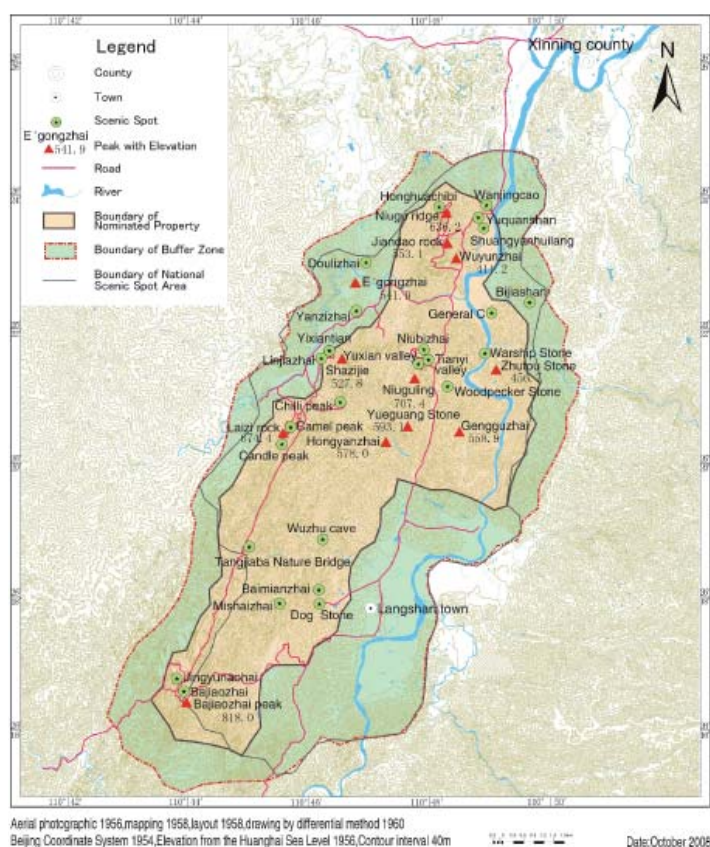
Map 3: Detailed map of Danxiashan Guangdong nominated component



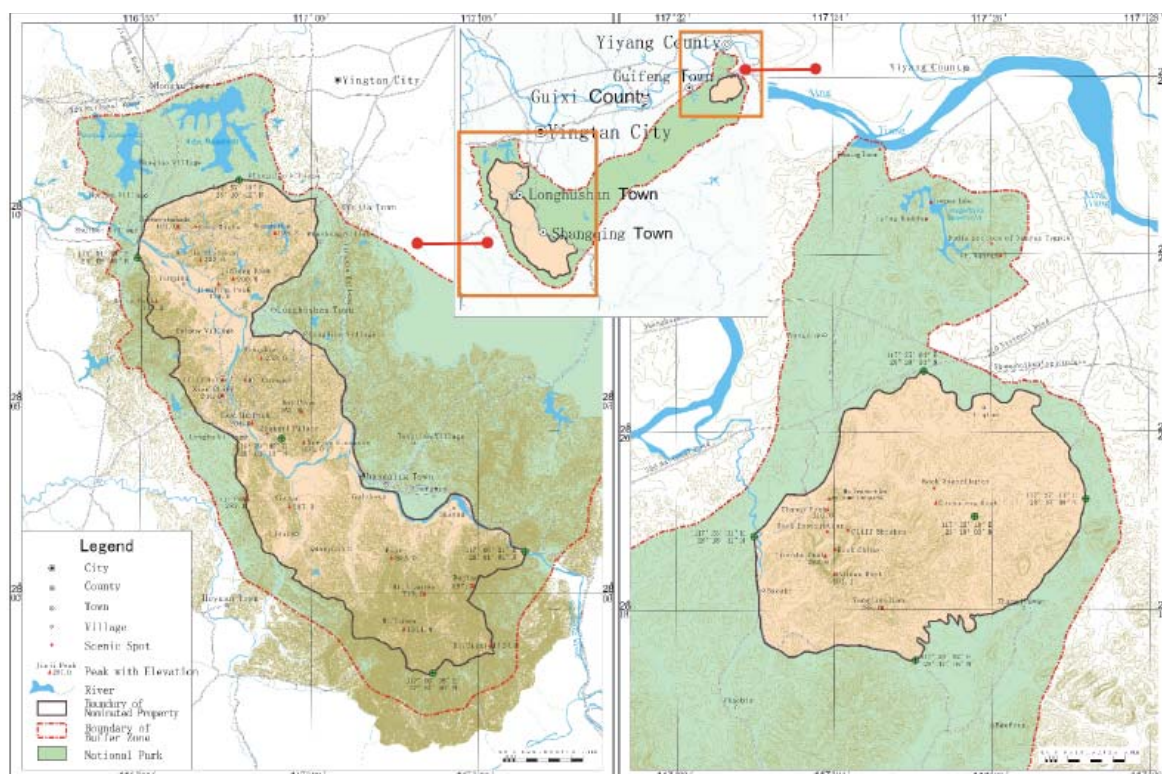
Map 4: Detailed map of Jianglangshan Zhejiang nominated component



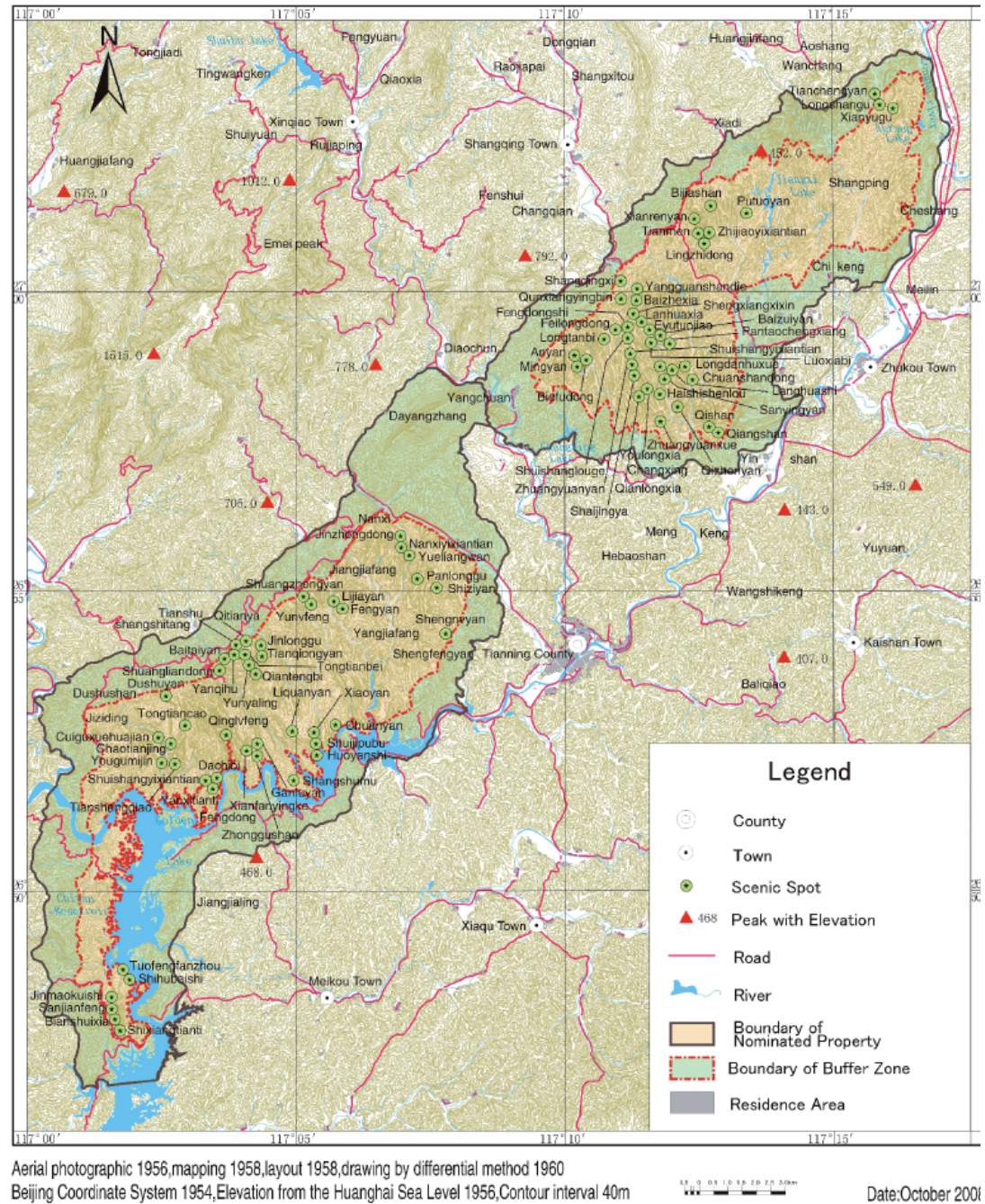
Map 5: Detailed map of Langshan Hunan nominated component



Map 6: Detailed map of Longhushan Janxi nominated component



Map 7: Detailed map of Taining Fujian nominated component



ASIA / PACIFIC

PHOENIX ISLANDS PROTECTED AREA

KIRIBATI



WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

PHOENIX ISLANDS PROTECTED AREA (KIRIBATI) - ID N° 1325

1. DOCUMENTATION

- i) **Date nomination received by IUCN:** 15th March 2009.
- ii) **Additional information officially requested from and provided from the State Party:** Additional information was requested from the State Party following the IUCN World Heritage Panel, and was provided to the World Heritage Centre and IUCN in February 2010.
- iii) **UNEP-WCMC Data Sheet:** To be developed following consideration of the nomination. Datasheets for existing marine World Heritage properties were consulted as relevant.
- iv) **Additional Literature Consulted:** Allen, G.R. (2007). **Conservation hotspots of biodiversity and endemism for Indo-Pacific coral reef fishes. Aquatic Conservation: Marine and Freshwater Ecosystems** 18: 541-556. Gupta, A. (2007). **Important Bird Areas (IBAs) in Kiribati**. Report prepared for the BirdLife International Pacific Partnership University of Hawaii at Manoa, Hawaii, USA.; Hillary, A., M. Kokkonen and L. Max (eds.) (2003). **Proceedings of the World Heritage Marine Biodiversity Workshop**, Hanoi, Vietnam, February 25 – March 1, 2002. UNESCO World Heritage Centre, Paris, France.; IUCN (2009). **IUCN Red List of Threatened Species**. Version 2009.1. Online: www.iucnredlist.org (Accessed on 20 August 2009).; Kelleher, G., C. Bleakley and S. Wells (1995). **A Global Representative System of Marine Protected Areas. Volume IV: South Pacific, Northeast Pacific, Northwest Pacific, Southeast Pacific and Australia / New Zealand**. Great Barrier Reef Marine Park Authority, IUCN and The World Bank, Washington DC, USA.; Pierce, R.J., T. Etei, V. Kerr et al. (2006). **Phoenix Islands Conservation Survey and Assessment of Restoration Feasibility: Kiribati**. Report prepared for Conservation International Samoa and the Pacific Islands Initiative of Auckland University. Eco Oceania, Onerahi, New Zealand.; Roberts, C.M., C.J. McClean, J.E.N. Veron et al. (2002). **Marine biodiversity hotspots and conservation priorities for tropical reefs**. *Science* 295: 1280-1284.; Spalding, M.D., C. Ravilious and E.P. Green (2001). **World Atlas of Coral Reefs**. Prepared at the UNEP World Conservation Monitoring Centre. University of California Press, Berkeley, USA.; Spalding, M.D., H.E. Fox, G.R. Allen et al. (2007). **Marine ecoregions of the world: A bioregionalization of coastal and shelf areas**. *BioScience* 57: 573-583.; UNEP / IUCN (1988). **Coral Reefs of the World. Volume 3: Central and Western Pacific**. IUCN, Gland, Switzerland and UNEP, Nairobi, Kenya; together with texts associated with the nomination document and identified during the evaluation mission.
- v) **Consultations:** 5 external reviewers consulted. The IUCN field mission met with the President of the Republic of Kiribati; the Chief of Cabinet, and with senior representatives of the Ministries of Environment, Lands and Agricultural Development (MELAD), Transport and Tourism Development, Ministry of Finance, Maritime Police, as well as the Australian High Commissioner to Kiribati, the Director of PIPA, leading scientists familiar with the property, and a range of representatives of community and stakeholder groups.
- vi) **Field Visit:** Bernard O'Callaghan and Ameer Abdulla. September-October, 2009
- vii) **Date of IUCN approval of this report:** 15th May 2010.

2. SUMMARY OF NATURAL VALUES (AA)

The Phoenix Island Protected Area (PIPA) is a 408,250 km² expanse of marine and terrestrial habitats in the Southern Pacific Ocean. The nominated property was declared a protected area in 2006 and encompasses the Phoenix Island Group, one of three island groups in Kiribati. PIPA is made up of a 7 corner polygon whose boundaries are defined by latitude and longitude coordinates in the open ocean. Given the area included within

its boundaries, PIPA is currently regarded as the largest designated Marine Protected Area in the world.

The nominated property has five main management zones. The "Core Zone" includes the protected / no take terrestrial island zone (Zone 1) of 7 islands, each with an adjoining 12 nautical mile (nm) no-take zone (Zone 2; wherein subsistence, long line, or purse seine fishing is banned). An 8th island, Kanton, allows for subsistence level harvesting of marine resources for a community of 30 individuals

but bans long line fishing for Tuna for 12 nm (Zone 3) and purse seining activities for 60nm (Zone 4). The remaining waters within the PIPA boundaries may be referred to as a buffer zone (Zone 5), wherein purse-seining and long line tuna fishing may be allowed with a Kiribati Fisheries license.

PIPA conserves one of the world's last intact oceanic coral archipelago ecosystems, together with underwater seamounts and other deep-sea habitats, in a nearly uninhabited region. The area contains approximately 800 known species of fauna, including approximately 200 coral species, 500 fish species, 18 marine mammals and 44 bird species. The structure and functioning of PIPA's ecosystems illustrates its pristine nature and importance as a migration route and reservoir. The key natural features of the property include 14 known submerged seamounts, which are presumed to be extinct volcanoes, and associated habitats situated in an area of ocean of up to 4,000-6,000m depth. There are three atoll islands with associated lagoons and perimeter coral reefs (Orona, Nikumaroro, and Kanton), five low reef islands surrounded by coral reefs (Manra, Rawaki, Birnie, McKean and Enderbury), two submerged reefs, and a large expanse of open and deep sea habitat. The area contains seven main habitats: island, lagoon, coral reef, deep reef, sea mount, deep benthos, and open ocean, which are all represented within both the current and proposed "no-take" fully protected zones. The large expanse of the PIPA, and its remoteness, combine to protect an area that is of high environmental quality, supporting functioning ecosystem processes including important pelagic migration routes, seabird and turtle nesting and feeding grounds, tuna spawning grounds, and an intact food web with high numbers of predators and herbivores. PIPA also supports a number of endemic and globally endangered species such as the Phoenix Petrel, Green Turtle, and Napoleon wrasse.

The coral reefs of the Phoenix Islands experienced a mass-bleaching event in 2002, following which 62% -100% coral mortality has occurred in some of the islands. A recent survey has shown exceptional recovery of the reef system, as compared with other parts of the world. This is in part due to a high abundance and diversity of the herbivorous fish communities and the low levels of reef fishing and pollution. This rapid recovery highlights the resilience of the site, which increasingly will become globally important as coral reefs around the world continue to deteriorate in the face of climate change.

3. COMPARISONS WITH OTHER AREAS

The comparative analysis presented in the nomination has been reviewed by IUCN, and augmented in partnership with UNEP-WCMC.

PIPA has a strong case for recognition in relation to criterion (vii) as one of the very few large marine protected areas in the world that contains numerous seamounts, and the only such one is in the tropics. The near pristine mid-ocean environment of the PIPA, its remoteness, the very low human presence and impacts create a substantial ocean wilderness. Twelve existing large marine World Heritage properties were reviewed in the comparative analysis (Great Barrier Reef, Australia; Shark Bay, Australia; Belize Barrier Reef, Belize; Malpelo, Colombia; Cocos, Costa Rica; Galapagos Islands, Ecuador; New Caledonia, France; Sian Ka'an, Mexico; Coiba, Panama; Tubbataha, Philippines; Aldabra, Seychelles; Socotra, Yemen). Of these, four are in the Tropical Eastern Pacific marine realm, three in the Central Indo-Pacific, two each in the Western Indo-Pacific and the Tropical Atlantic, and one in the Temperate Australasia realm (Spalding et al. 2007). The famous Australian Great Barrier Reef, currently the largest World Heritage property, lies in the Central Indo-Pacific. In contrast, both PIPA, and the currently nominated Papahānaumokuākea Marine National Monument (PMNM), USA, lie within the Eastern Indo-Pacific realm, which does not yet have any World Heritage properties with notable marine areas (Easter Island, Chile and Henderson Island, UK are listed as terrestrial natural properties). East Rennell, Solomon Islands is a mostly terrestrial natural World Heritage property in the Central Indo-Pacific realm. PIPA is one of most extensive remaining intact open ocean seascapes, with its natural values still intact, while the threats are increasing elsewhere in the world.

In relation to ecosystem processes, IUCN considered PIPA's key features alongside PMNM and three closest comparators amongst inscribed World Heritage properties, identified from within those noted above. Key points of comparison are as follows:

- PIPA (Kiribati): equatorial, archipelago of atolls and low islands in remote deep sea, maximum water depth of 6,147 m, over 14 large seamounts up to a height comparable to the Mont Blanc, largest MPA in the world, 2,551 ha land;
- Tubbataha Reefs (Philippines): atoll in deep sea, maximum depth of 2,000 m compared to 6,147 m in PIPA, some seamounts, marine area of PIPA over 420 times larger;
- Aldabra Atoll (Seychelles): atoll but no archipelago, mostly shallow water compared to deep water in PIPA, marine area of PIPA over 2,910 times larger;

- PMNM: tropical / subtropical transition zone, oceanic islands over volcanic hotspot, archipelago of atolls and low and eroded high islands in deep sea, maximum depth of 4,600 m compared to 6,147 m in PIPA, large seamounts, 2nd largest MPA in the world after PIPA, 1,400 ha land;
- Galapagos Islands (Ecuador): equatorial, oceanic islands over volcanic hotspot, archipelago but no atolls, maximum depth of 4,000 m compared to 6,147 m in PIPA, some seamounts, marine area of PIPA 3.1 times larger than the one of Galapagos.

PIPA is distinguished, aside from its very large area, by the wide range of intact marine ecosystems from coral reefs, submerged reefs, seamounts to deep sea. It has a high degree of remoteness and naturalness; with predator-dominated ecosystems, healthy fish, coral and sea turtle populations, and with a demonstrated resilience of its reefs to coral bleaching. It has a larger maximum and average water depth than any existing World Heritage property or nominated properties with full vertical and lateral connectivity between terrestrial, ocean floor and open ocean habitats. The horizontal and vertical scale of the property, its sheer size, and its pristine nature provide a compelling case for the recognition of the property under criterion (ix).

In relation to biodiversity values, IUCN has also considered the range of large marine protected areas, including those included on the World Heritage List, together with global assessments and gap analyses. In terms of species richness neither PIPA nor PMNM can be compared with the marine diversity found in the Coral Triangle, New Caledonia or the Great Barrier Reef. PIPA is not a marine centre of endemism, marine biodiversity hotspot, or a priority ecoregion for global conservation. Its small land areas are part of the large terrestrial biodiversity hotspot Polynesia-Micronesia, but make a relatively small contribution to its biodiversity values. BirdLife is understood to be in the process of designating up to six Important Bird Areas in the Phoenix Islands because of their importance for seabird. Compared to existing large marine World Heritage properties, Tubbatana, Socotra and Aldabra have more coral species than PIPA; whilst New Caledonia, the Great Barrier Reef, Coiba and Socotra have more fish species. PIPA is relatively less species-rich largely because of its location in a relatively species-poor region in the middle of the Pacific: overall biodiversity decreases from west to east across the Pacific. A recent assessment of the distribution of 3,919 species of Indo-Pacific coral reef fishes found that neither Kiribati nor Hawaii is among the countries with the highest richness. However, while the Hawaiian Islands are among the top-ranked sites based on their number and percentage of endemic species, Kiribati does not show high endemism in

coral reef fishes. A comparison between PIPA and PMNM has been included in the evaluation report of the latter, and notes that PMNM has a more substantive case for recognition under criterion (x) than PIPA, including due to its greater number of endemic species and its role in supporting the largest tropical seabird rookery in the world.

It is difficult to establish the current importance of PIPA for seabirds. Historically, millions of seabirds have been reported for PIPA, including 19 breeding species. The nomination notes that, together with Kiribati's Line Islands, PIPA supports among the largest assemblages of tropical seabirds in the world both in term of species diversity and population sizes. A recent assessment concluded that, whilst PIPA still supports a wide diversity of seabird species, this diversity is under continuing and serious threat from invasive mammal species, most notably rats and rabbits. Two globally threatened seabird species breed in the Phoenix Islands: the Endangered Phoenix petrel and white-throated storm-petrel. In terms of total numbers, PIPA does not have large breeding populations of these birds. IUCN considers that the role of the property in protection of threatened species is clearly of significance, but is not sufficient, considering comparisons with other World Heritage properties, to provide a strong basis for the application of criterion (x) to the property.

4. INTEGRITY, PROTECTION AND MANAGEMENT

4.1. Protection

The Phoenix Islands Protected Area (PIPA) was created by the Phoenix Islands Protected Area Regulations 2008 under the Environment Act 1999 – these regulations are currently in-force in the area. The regulations seek to clearly delineate the boundaries of the PIPA, establish the PIPA Management Committee and seek to ensure that a Management Plan is in place for PIPA. A number of measures are prescribed for the longer-term management of PIPA. Essentially all activities within PIPA require a permit as stipulated under the Regulations. The current legal protection provides a sufficient basis to develop effective protection of the nominated property. Measures for application for permits are clearly described in the nomination. All the land and sea within the boundaries of PIPA is owned by the Government of Kiribati.

IUCN requested information from the State Party on the status and development of fisheries and no-take zones in the nominated property. The State Party provided a detailed response mostly based on the management plan (2010 – 2014), as updated and approved after the submission of the nomination. Zonation is described as a core management tool. The plan suggests a two-

phased approach. The objective of the current phase 1 of the zonation is to secure the protection of islands, lagoons, reefs and near-shore habitats. These no-take areas total 3.7 % of the overall surface of PIPA. Phase 2 is intended to result in a 25 % increase in the no-take zone coverage, and will be implemented once the PIPA Trust Fund income reaches an adequate capitalization level to compensate the Government of Kiribati for any losses in DWFN (Distant Water Fishing Nation) license fees associated with such limitations. This would include seamounts, enlarged zones around the islands, and a connection of the no-take zones between the two groupings of islands among other areas. The exact boundaries are to be defined during the implementation of the management plan taking into account possible tourism development and, in the case of Kanton Atoll, local subsistence needs. The State Party expects both phases to be implemented by December 2014.

IUCN appreciates this clear, positive and creative strategy, but also notes that implementation of it has just begun, and that the main phase of zonation, which would establish effective levels of protection through no-take zones is contingent on the capitalization of a Trust Fund.

IUCN considers the protection status of the nominated property meets the requirements set out in the Operational Guidelines within the areas identified as no-take zones, but notes that at the present time the extent of these areas is very limited in relation to the area of the property as a whole. Taken as a whole the property does not fully meet the requirements of the Operational Guidelines at the present time, but should increasingly do so, as the plans to create PIPA proceed.

4.2 Boundaries

PIPA's boundaries are clearly defined. The boundaries are mostly straight lines with some adjustments to the boundaries to align with the Exclusive Economic Zone (200 NM) of Kiribati. There various clearly delimited zones within PIPA as described in the Management Plan and World Heritage Nomination and noted above. Marking of the boundaries relies on their inclusion in relevant charts, and notices to mariners, as site specific demarcation is not practical.

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

4.3 Management

A proposed PIPA Management Plan was provided with the nomination, and is understood to have been approved in November 2009. IUCN has reviewed the management plan and considers

that it is adequate for the short-term given the low level of visitation to the site, but would need to be adapted should visitation increase. The plan could also be developed further to be more comprehensive, including further plans to improve the values of the terrestrial aspects of the site and ensure full operation of the management of the site. Further development of the measures for rehabilitation of ecological values on some islands affected by invasive species and other impacts would be valuable, together with consideration of cultural heritage values.

The significant concern regarding the management of the nominated property, in relation to its nomination to the World Heritage List is the currently limited state of development of the management system. There are currently no permanent government staff solely dedicated to the management of PIPA. The one staff member acting as the Director for the PIPA initiative is currently funded by supporters including Conservation International and the New England Aquarium. Other government agencies are aware of the PIPA initiative, and many of the proposed management measures required within the PIPA fall with the mandate of agencies such as the Ministry of Fisheries and the Maritime Police, Department of Environment and Ministry of Interior and Social Affairs. Current enforcement capacity on the water is limited, especially considering the scale of the property. There is one patrol boat operated by the Marine Police to monitor all of the waters with the EEZ of Kiribati. This patrol boat may enter the Phoenix Islands 1-2 time per year. Response to encroachment is limited as it may take 4 days to steam from Tarawa to sites within PIPA. An agreement on patrolling with the US Coastguard is in place, but this is also limited in scope to 1-2 trips per year. A Vessel Monitoring System (VMS) has been established for licensed fishing boats operating in Kiribati waters, but this system is not able to detect illegal fishing. Occasional flyovers take place by French, Australian and New Zealand Authorities and could make a contribution to enforcement.

There is currently no dedicated budget from the Government for management of the PIPA, although grants are being made available to the Government of Kiribati from partners in the PIPA initiative including Conservation International and New England Aquarium. A GEF Project Proposal "Phoenix Islands Protected Area (PIPA)" is currently under development, and is seeking \$890,000 towards establishing management regimes for the PIPA. It is projected that this three-year project would commence in 2010.

Initiatives are being taken to develop a future sustainable financing for management of the nominated property. Legislation to support PIPA financing is provided in the PIPA Conservation

Trust Act (No. 1 of 2009) – An Act to provide for the establishment of the PIPA Conservation Trust and for incidental matters. This has been passed to provide for the establishment of the Trust to provide sustainable income from the returns on the capital of the trust. The primary activities of the Trust will be to support the administration of the trust, management of PIPA and ensure limited exploitation activities in PIPA, and to provide the Government with reasonable compensation for the loss in revenues occasioned by the measures for the protection of the PIPA. The Trust is not yet operational, but it is anticipated that an Executive Director for the trust will be appointed in early - mid 2010, and that by-laws to facilitate operation will be put in place on the same timelines. The Management Plan for the nominated property indicates that the Government of Kiribati will provide financing of USD 2.5 million subject to co-financing from external sources.

IUCN noted to the State Party its concern about these issues, and requested information on the timeline and list of activities anticipated to establish effective management of the nominated property, including the Trust Fund. In its response the State Party recognizes there is limited but growing capacity which is consistent with the phased approach it is taking to the establishment of PIPA. It notes that there is a whole of government approach to PIPA, that the management plan is endorsed by the Cabinet which is the highest level of support and commitment, and that there are functioning partnerships with academic, non-governmental and governmental (U.S.A, Australia, New Zealand) institutions. In the case of monitoring this has already lead to prosecution and fining of a vessel fishing illegally. It also notes success of early management projects related to invasive species, and that the remoteness of the property affords a relatively high degree of protection. The response states a total investment of USD 3 million has been made since 2000. A broad range of ongoing activities has been carried out based on different sources of funding, and the GEF project is expected to financially support the implementation of the management plan. The State Party further notes that the Trust Fund is based on and defined in national legislation and now has confirmed board members. Conservation International has confirmed an anticipated USD 2.5 million commitment and fundraising is underway, including in relation to the State Party's contribution.

Whilst acknowledging this progress, IUCN is concerned that at the present time the lack of definitive positions regarding the key requirements to managed the property, viz: adequate and sustainable finance and staffing. At the present time financial resources are not sufficient from state government allocations for management of the nominated property, and there is insufficient

enforcement capacity and human resources for management of the site property. Should the trust fund be established and funded, to a minimum level of USD \$13 million as proposed in its business model, this would enable the staffing of the management authority to be addressed, assist in longer-term enforcement and provide resources for the more effective management and monitoring of the site. IUCN considers that these aspects should be put in place and consolidated prior to recommending possible inscription on the World Heritage List. In this way the possibility of inclusion on the World Heritage List may also assist the State Party to galvanise the necessary additional support to assure the establishment of PIPA on a secure and adequately funded basis. Addressing these issues will take some time, considering the scale of the project and work required to establish a fully functioning management system, and should also be the subject of further verification through an official evaluation mission. IUCN considers that the World Heritage Committee should provide guidance and support to this work.

IUCN considers the management of the nominated property does not meet the requirements set out in the Operational Guidelines, at the present time, but with adequate established resourcing would have the potential to do so.

4.4 Threats

Although the isolation of the PIPA reduces the scope of threats to it, there are still a range of immediate threats to the property. The most significant of these are related to illegal fishing by licensed fishing vessels is able to be monitored through GPS based fishing management system operated by the Ministry of Fisheries. Illegal fishing by unlicensed vessels is more difficult to address, considering the challenge of identification of vessels with the limited enforcement capacities. Alien and invasive species on the islands require continued eradication measures. The nomination notes that first eradications of invasive mammal species were conducted on Rawaki (rabbit) and McKean Island (rat) in 2008 and that it is expected that bird populations will recover to previous levels. However this may be a long process, requiring careful monitoring.

The status relating to the Deep Sea mining in PIPA needs to be clarified in both the regulations and management plan. However, all activities within PIPA such as Deep Sea Mining require a permit subject to an EIA. A National Tourism Strategy is currently being prepared. There are plans for tourism development in at least two of the islands. These plans need developed to ensure that environmental impacts are minimized. Re-introduction of invasive species is a further concern, and it is important all visitors to the islands take necessary measures

to avoid the introduction of invasive and alien species. Measures to protect islands from invasive species are highlighted in the visitor permit system and would require effective operational control and monitoring. Deep sea trawling is a further threat, but as the area is very deep and this is unlikely at the present time, and would require a permit. Climate impacts, such as the coral bleaching event sea level rise and ocean acidification are also of concern, and global climate change may have continuing impacts on the property.

The current and potential threats to the property require adequate and effective responses through the creation and operation of the management system for the property, as noted above.

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

5. ADDITIONAL COMMENTS

ICOMOS provided comment to IUCN on the cultural values of the nominated property and noted that the islands have material evidences and immaterial associations of periodic occupation over one to two millennia. Cultural associations are described in the nomination document, and work is underway to determine the importance of the cultural values. ICOMOS note that the area has not been extensively studied in the academic literature. Identified cultural values relate to archaeological evidence of early colonization by Micronesians and Polynesians, ancient and recent oral traditions, and archaeological remains of post-contact land uses from the 19th and 20th centuries. ICOMOS considers that further work would be required to determine whether there might be justification for the use of cultural criteria in relation to the link between the atolls and migrations across the Pacific. It considers that the ICOMOS Thematic Study on Cultural Landscapes of the Pacific Islands would be relevant to guide any further work that might be undertaken in a comparative context. Even though ICOMOS considers that, on the basis of current evidence, the use of cultural criteria could not be justified, it nevertheless encourages the State Party to identify and respect the cultural values in the management of the Phoenix Islands Protected Area. IUCN concurs with the views of ICOMOS in this regard.

6. APPLICATION OF CRITERIA

The property has been nominated under natural criteria (vii), (ix) and (x):

Criterion (vii): Superlative natural phenomena or natural beauty

With an average water depth of 4,500 m and a maximum depth of 6,147 m, PIPA has a large bathymetric range. It is one of the very few large marine protected areas in the world that contains numerous seamounts and the only such one is in the tropics. The highest peaks rise more than 5,000 m above the seabed and a number reach the surface where they are capped by coral atolls and reefs or have a near surface manifestation. The near pristine mid-ocean environment of the nominated property, its remoteness, the very low human presence and impacts are key attributes that make PIPA one of most extensive remaining intact open ocean seascapes globally.

IUCN considers that the nominated property meets this criterion

Criterion (ix): Ecological and biological processes

PIPA is distinguished, aside from its very large area, by its range of intact and functioning marine ecosystems from coral reefs, submerged reefs, seamounts to deep sea. It has a high degree of remoteness and naturalness; with predator-dominated ecosystems, healthy fish, coral and sea turtle populations, and with a demonstrated resilience of its reefs to coral bleaching. It has a larger maximum and average water depth than any existing World Heritage property. There is vertical and lateral connectivity between terrestrial, ocean floor and open ocean habitats. The horizontal and vertical scale of the property, its sheer size, and its pristine nature are exceptional.

IUCN considers that the nominated property meet this criterion.

Criterion (x): Most important and significant natural habitats for in-situ conservation of biological diversity including threatened species of outstanding universal value

Whilst the property certainly has important values for biodiversity conservation, and this should be an ongoing priority, the marine ecosystems of PIPA not strongly recognized as global conservation priorities. The levels of species richness and endemism, and number and percentage of threatened species are lower than in existing marine World Heritage properties inscribed under this criterion. The terrestrial ecosystems of PIPA are small and not a significant contribution to Polynesia-Micronesia biodiversity hotspot. Significance as a breeding site for seabirds is also not at the levels of existing island World Heritage properties inscribed under this criterion; a diversity of seabird species are still

far below historic levels due to impact from invasive mammal species and habitat conversion.

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

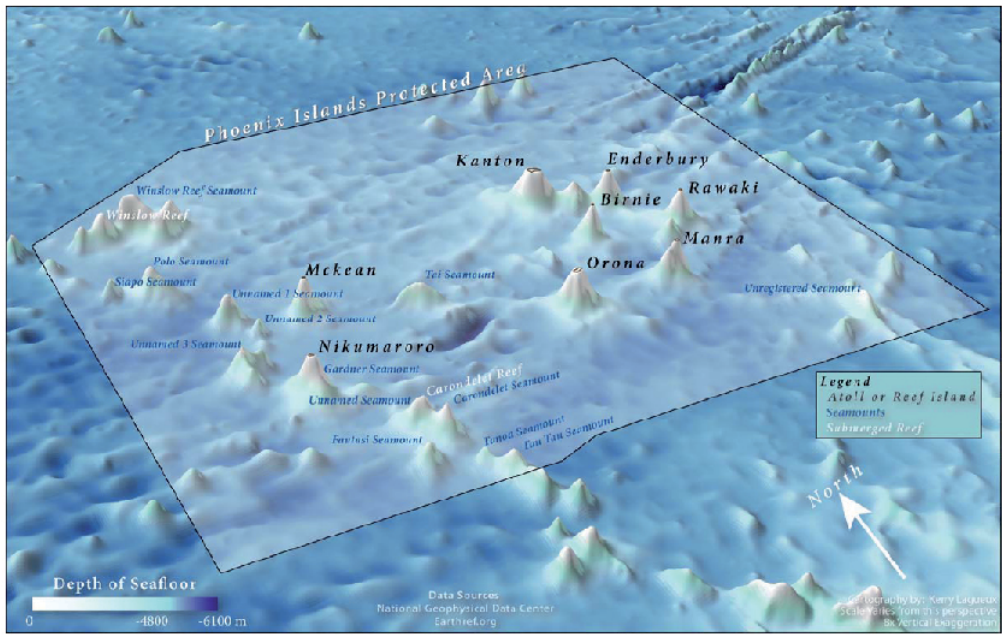
7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents **WHC-10/34.COM/8B** and **WHC-10/34.COM/INF.8B2**,
2. Defers the examination of the nomination of the **Phoenix Islands Protected Area, Kiribati** to the World Heritage List under criteria (vii), (ix) and (x);
3. Recommends the State Party to:
 - a) Refocus the nomination on the values and features within the Phoenix Islands Protected Area in relation to criteria (vii) and (ix);
 - b) Consider refocusing a revised nomination on the most significant areas of Phoenix Islands Protected Area, where the required integrity, protection and management requirements set out in the Operational Guidelines have been fully established, and possibly complemented by further extension(s) when additional areas of the nominated property have also met these requirements;
 - c) Strengthen the management framework for fisheries, considering extension of no-take areas, measures to prevent degradation of seamounts and concrete timelines for the phasing out of tuna fishing;
 - d) Establish a fully functional Management Authority for the Phoenix Islands Protected Area;
 - e) Allocate an appropriate budget towards the management of Phoenix Islands Protected Area through a funded and functional trust fund or through other appropriate mechanisms;
 - f) Ensure capacities and resources for refined and systematic monitoring, surveillance and law enforcement;
4. Highly commends the State Party on the efforts that have been made towards the establishment and protection of the Phoenix Islands Protected Area, including the exemplary multi-agency approach;
5. Also highly commends the State Party on the many successful activities carried out over the last years, such as eradication of terrestrial invasive species in several areas and encourages the State Party to continue these efforts for both marine and terrestrial invasive species through eradication programmes and prevention of new invasions through establishment and enforcement of appropriate protocols;
6. Welcomes the sister site agreement between the Governments of Kiribati and the United States of America on the management of Phoenix Islands Protected Area and Papahānaumokuākea Marine National Monument respectively, and encourages State Parties to continue and, as possible, expand on this collaboration;
7. Welcomes the strong support from the States Parties Australia, France, New Zealand and the United States of America, as well as from international institutions and non-governmental organizations and encourages these partners to further support the management, surveillance and funding of Phoenix Islands Protected Area, including the nomination of the area for inscription on the World Heritage list.

Map 1: Three dimensional map of the underwater topography of PIPA



This three dimensional map shows the underwater topography of PIPA. The atolls (4), reef (4) islands, submerged reefs (2) and 9 of the 14 confirmed seamounts have been named. Average depth of the seafloor is about 4,500 metres, with a maximum of 6,147 m. Details on each of the topographic features are provided elsewhere in the nomination document.

ASIA / PACIFIC

TAJIK NATIONAL PARK (MOUNTAINS OF THE PAMIRS)

TAJIKISTAN



WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

TAJIK NATIONAL PARK (MOUNTAINS OF THE PAMIRS) (TAJIKISTAN) ID NO. 1252

1. DOCUMENTATION

- i) **Date nomination received by IUCN:** 16th March 2009.
- ii) **Additional information officially requested from and provided by the State Party:** Additional information was requested from the State Party following the IUCN World Heritage Panel, and was provided to the World Heritage Centre and IUCN in February 2010.
- iii) **UNEP-WCMC Data Sheet:** Sourced from nomination document which cites 21 references.
- iv) **Additional literature consulted:** Dyurgerov, M. (2002) **The top 5 of the World**. Institute of Arctic and Alpine Research, University of Colorado, Boulder (in: 'Berge 5/2002', Olympia-Verlag, Nürnberg).; Fisher, R.D. (1995) **Earth's Mystical Canyons**. Sunracer Publications, Tuscon, 152pp.; Magin, C. (2005) **World Heritage Thematic Study for Central Asia – A Regional Overview**. IUCN; Gland.; Middleton, R. & Thomas, H. (2008) **Tajikistan and the High Pamirs**. Odyssey Books & Guides.; Republic of Tajikistan (2008) **Tajik National Park (Mountains of the Pamirs)**. Nomination document.; Thorsell, J. & Hamilton, L. (2002) **A Global Overview of Mountain Protected Areas on the World Heritage List**. IUCN, Gland.
- v) **Consultations:** Eleven external reviews. Extensive consultations were undertaken during the field visit with representatives of the Committee on Environmental Protection, Tajik National Commission for UNESCO, State Organization of Special Protected Natural Territories, regional and local authorities, National Park and forest management staff, as well as local NGOs.
- vi) **Field visit:** Chimed Ochir Bazarsad and Gerhard Heiss, September/October 2009.
- vii) **Date of IUCN approval of this report:** 22nd April 2010.

2. SUMMARY OF NATURAL VALUES

The property is nominated under the name Tajik National Park (Mountains of the Pamirs), and is located in the northeastern part of Tajikistan in the province of Gorno-Badakhshan (districts of Vanch, Rushan and Murgab) within the Pamir-Alai region, bordering Kyrgyzstan. The whole of the national park covers about 11% of the area of Tajikistan. The nominated property comprises only a part of the national park and covers 1,226,500 ha. It is surrounded by a buffer zone of 1,385,174 ha which is also part of Tajik National Park. The property and its buffer zone together cover the entirety of Tajik National Park. In the following report, the abbreviation TNP refers to the nominated property, not the whole of Tajik National Park.

The Pamir Mountains are part of the Central-Asian uplands. It is customary to divide the Pamirs into a western area and an eastern area, distinguished by their relief. In the Eastern Pamirs mountain relief is predominantly developed on a high raised foundation. While the heights above sea level average 6,100 m or more, the relative heights of the peaks above their foundation do not in most cases exceed 1,000-1,800 m. The ranges and massifs

have mainly rounded contours, and the wide and flat-bottomed valleys between them are occupied either by meandering rivers or by dry channels. In the Western Pamirs the relief is high-mountain, alternating between low ranges and alpine ridges capped by snow and glaciers; and there are deep, narrow ravines with high, rapid rivers. The main part of the nominated property lies in the Eastern Pamirs, with two ridges penetrating the Western Pamirs and the Pamir-Alay to the north. The highest peak in the nominated property is Pik Ismoil Somoni (7,495 m), and plateaus of up to 4,000 m are common.

The Pamir ranges are affected by two continental seismic zones, the south-dipping Pamir seismic zone and the north-dipping Hindu Kush seismic zone, converging at depth from both the north and south which make the region one of the most geologically active territories in the world. The Pamir highlands are subject to strong and frequent earthquakes. The region overlies what is reported to constitute the deepest seismic zone known from any continental crust, which includes some of the most active faults in Central Asia.

The climate of the Pamirs is sharply continental with a seasonal difference in temperature of up to 100°C. High ridges prevent humid air masses from entering the area of the nominated property from the west and south resulting in aridity with an average annual precipitation of only 63 to 117 mm. Strong, almost permanent winds are characteristic. The eastern part of the nominated property is classified as cold continental high-mountain desert. The surface relief is formed by glacial processes and the entire range of glacial formations and phenomena can be found. The number of recorded glaciers in the Pamirs is 1,085. More than 1000 glaciers exceed 1.5 kilometers in length, a dozen exceed 20 kilometers. The majority are found on the nominated property, including the largest valley glacier of Eurasia, the Fedchenko glacier which is 77 kilometers in length. The glaciers within the property are an important water reserve for Central Asia.

The territory of Tajik National Park hosts 170 rivers and more than 400 lakes. All, except Markanzu River, connect to the Amudaria River Basin which form part of the Aral Sea Basin. Most rivers originate in the nominated property. The largest lakes within Tajik National Park are Sarez, Karakul and Yashilkul. While Karakul and Yashilkul Lake are located in the buffer zone, Sarez Lake is found within the property. It was formed as a result of an earthquake in 1911 and is the biggest lake in the Pamir in terms of water volume. Karakul Lake, in the buffer zone, is the largest lake of the Pamirs in terms of area: located at almost 4,000 m, it is considered the highest salt lake in the world.

Two floral regions of the Middle East and Central Asia meet in the nominated property. 639 higher plants belonging to 57 families have been documented. There are three vegetation zones within the nominated property: the sub-alpine zone below 4,200 m, covered with Eurotia deserts and feather-grass steppes; the alpine zone between 4,200 and 4,800 m, dominated by semi shrub Tanacetium; and the nival belt above 4,800 m with poor vegetation cover comprised of cold-resistant plants. In lower areas of the buffer zone, the number of recorded vascular plants increases to 2,100 different species. Six different types of vegetation occur in the property, including Teresken (*Ceratoides papposa*) and wormwood deserts, talus and rock flora, and areas of steppe and meadows. The nomination document lists 74 vascular plants of rare, endemic and relic species found on the territory of the national park. It could not be established which are found on the territory of the nominated property, as opposed to the buffer zone. TNP is considered an important centre for wild forms of cultivated plants. According to information received during the IUCN field mission, the Bartang Valley of is home to more than 200 different native cereal species.

Harsh environmental conditions and isolation have contributed to a relatively poor fauna with a high degree of endemism. The fish fauna of Pamir belongs to an ancient group and is characterized by low diversity, high endemism and a lack of predatory species. A total of 115 bird species are found in the nominated property and 162 species on the territory of Tajik National Park. They include Bearded Vulture, Himalayan Griffon, Mongol Saker Falcon, Snow Pigeon, Tibetan Snowcock and Tibetan Pallas's Sand Grouse. Endemic birds at species or subspecies level include Pamir Plover, Red-tailed Wheatear, Alpine Snow-finch, Pamir Twite, and Pamir Brandt's Rosy Finch. The nominated property is home to 17 mammal species, while there are 33 mammal species in the national park as a whole. Most noteworthy are Marco Polo Argali, estimated at about 1,500 individuals in the nominated property and 3,500 in Tajik National Park. There are also Snow Leopard, for which estimated numbers vary largely between 15 and 150, Brown Bear with two subspecies, one of which is believed to be endemic, Wolf, Turkestan Lynx, and Dhole, also known as the Asiatic Wild Dog.

3. COMPARISON WITH OTHER AREAS

The property has been nominated under all four natural criteria. Tajik National Park (2,611,674 ha) is the largest high mountain protected area of the Eurasian continent and among the largest protected areas in Central Asia. The nominated property has been identified in a number of previous gap analyses as having potential for inclusion on the World Heritage List. The IUCN thematic study for Central Asia noted it has been considered by three out of five gap analyses as a possible priority, although the possible criteria for inscription were not defined.

In terms of landscape features, the nominated property boasts vast high plateaus in the east and rugged terrain with deep gorges in the west. The western part is a sequence of impressive gorges. The gorges located within the nominated area are very deep, however the deepest, are not included in its boundaries. Within the property, the Kokuibel gorge near Ghudara has an altitudinal difference of more than 2,600 meters between the valley bottom at about 3,100 meters and its highest point at above 5,700 meters. The gorge of the upper Vanch Valley between the Abdulkhagor Glacier and the Bears Glacier is even more dramatic, while another stretch of the river between the Russian Geographic Society Glacier and the Bears reaches 2,500 meters in altitudinal difference. The canyon of the Bartang River, outside the nominated property reaches more than 3,300 meters in depth.

The High Plateau of Tibet is the largest high plateau of the world. The nominated property is clearly

not the foremost example of this feature in terms of size, but boasts a remarkable combination of canyons, rugged summits and high plateau within one protected area. The high plateau landscapes within the nominated property are comparable to those within already inscribed properties such as The Golden Mountains of Altai (Russian Federation), Sagarmatha (Nepal), Nanda Devi and Valley of Flowers (India), Jungfrau-Aletsch-Bietschhorn (Switzerland), Western Caucasus (Russian Federation), Kluane/Wrangell-St Elias/Glacier Bay/Tatshenshini-Alsek (Canada/United States), Huascaran National Park (Peru) and Los Glaciares (Argentina). The Three Parallel Rivers of Yunnan Protected Areas (China) does contain large high plateaus but is not comprised of a contiguous area and is clearly more influenced by human use. Other comparable sites not inscribed on the World Heritage list include Kanchendzonga National Park (India), Central Karakorum (Pakistan), Jigme Dorji National Park (Bhutan). The highly active tectonics of the nominated property are also notable. Lake Sarez, near the centre of the nominated property is an illustration of the resulting landforms, created by landsliding following an earthquake and representing one of the youngest large lakes in the world.

Additional comparative analysis of the biodiversity values of the nominated property was carried out with the support of UNEP-WCMC suggests that the biodiversity values within the nominated property do not stand out at the global level. The nomination claims that TNP would help to fill the gap in the World Heritage List by including landscapes that could be classified as cold winter deserts. However, based on a GIS analysis by UNEP-WCMC, TNP does not contain significant areas of Udvardy's Cold Winter Deserts biome. There are also more important representations of this biome elsewhere in Central Asia. TNP alone thus does not represent a major or outstanding example of this desert type.

While the biodiversity of the Central Asian mountains is recognized as outstanding Tajik National Park alone does not appear to be the most biologically diverse and/or representative site of the broader area. TNP is part of the large terrestrial biodiversity hotspot Mountains of Central Asia, which covers 863,362 km² and consists of two of Asia's major mountain ranges, the Pamirs and the Tien Shan. The flora of this hotspot is a mix of Boreal, Siberian, Mongolian, Indo-Himalayan and Iranian elements. There are more than 5,500 known species of vascular plants in the hotspot, about 1,500 of which are endemic. However, of the 5,500 plant species recorded in the hotspot, only 639 (12%) occur in the nominated property. Endemism is also high in the hotspot's amphibians and freshwater fishes; however, the high elevation environments of TNP are very poor in these vertebrate groups, and the more than 100 endemic species that are referred to

in the nomination include mostly invertebrates. Of the 143 mammal species recorded in the hotspot, only 17 (12%) occur in the nominated property, of the 489 bird species only 115 (24%). The nominated property does not compare favourably with other tentative list sites in the region in relation to its biodiversity values, despite its large size. TNP is home to only a small number of globally threatened species.

Globally, the nominated property is not at the highest level of value in relation to threatened mammal and bird species, although is of international importance. Snow Leopard occur in a number of existing World Heritage properties, such as The Golden Mountains of the Altai, Nanda Devi and Valley of Flowers National Parks, Sagarmatha National Park and Uvs Nuur Basin. Asiatic Wild Ass is not mentioned in the nomination as occurring in TNP. At the subspecies level, Tajik National Park is home to a population of Marco Polo Argali, one of approximately nine subspecies of the globally threatened Argali Sheep. The nomination reports 1,500 individuals in the nominated property and 2,000 individuals in the buffer zone. Their preferred territory is the high plateau area in the east which is predominantly not included in the nominated property. The Pamirs are the second richest area in the world for butterflies, after Tibet. Some of the rare, endemic and most threatened species are found on the high elevations of the property, others occur only in the valley bottoms of the buffer zone outside the nominated property. While there are highly important biodiversity values at the regional level, these do not appear to be globally outstanding in relation to criteria (ix) or (x).

Considering the above, it could be suggested that a transboundary or transnational serial nomination with neighbouring countries might be required to capture the full range of biodiversity values present in the Pamir and/or Tien Shan mountain ranges. If a transboundary site is not feasible, the case for inscription of TNP alone appears strongest in relation to criterion (vii) and (viii).

4. INTEGRITY

4.1 Legal status

The entire nominated area and its buffer zones are located within Tajik National Park. Legal protection is provided under the Natural Protected Areas Law of the Republic of Tajikistan, No. 329, of 1996, Decision of the Government of Tajikistan, No. 267 of 1992; "About Creation of the Tajik National Park" and the Order of State Directorate of Natural Protected Areas, No. 147 of 2005.

The control of compliance with the legal framework in Tajik National Park is carried out by the State

Department on Natural Protected Areas. Under The Natural Protected Areas Law of the Republic of Tajikistan geological surveys and exploitation of minerals, cutting of woody plants, unregulated use of flora and fauna, ecologically harmful activities, changes of the hydrological regime, construction of major roads, pipelines, transmission facilities and other communication services which are not related to park management, and the introduction of living organisms are prohibited.

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

4.2 Boundaries

The nominated property covers a range of the landscapes of Tajik National Park, but there are also important high plateau areas, gorges and lakes in the buffer zone, including around Karakul Lake, which also has distinctive and important values. Coverage of valley bottoms likewise appears limited. Rivers have been used as boundaries to the nominated property. This has certain advantages but bears the risks of excluding or artificially splitting valuable habitat and often conflicts with local land use. Both could be addressed by using crests and ridges rather than valley bottoms as natural boundaries.

While the boundaries of the national park appear widely understood by the park staff, the IUCN mission noted that there is some confusion about the boundaries of the nominated property. There is no demarcation or signaling of the boundaries of the national park or the nominated property on the ground. As a minimum, it would be appropriate to at least clearly mark the boundaries at the most frequented entry points.

The justification for not using the boundaries of the existing national park as boundaries of the nominated property is not convincing. Besides implications for the values and integrity, and the lack of certainty about which values are in the nominated property, it is also misleading to suggest the name Tajik National Park to be used for a property which is in fact considerably smaller and only in part overlaps with the national park bearing the same name.

In relation to biodiversity values, IUCN notes that the national boundaries in this area do not follow ecological considerations. Given the location of the park close to the border of Tajikistan with other states, there are good reasons to consider a transboundary approach to conservation. It would be relevant to consider the potential to develop a larger transboundary nomination related to the biodiversity values of the Pamirs, in conjunction with Kyrgyzstan and possibly other neighbouring countries. Such an approach would of course

require political feasibility and would result in a re-design of the boundaries.

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

4.3 Management

The entire territory under consideration is state-owned with a clear management mandate for the park authority. There is an interim management plan which was prepared for the period 2007-2009. This provides a comprehensive source of information regarding the property, and guidance on management prescriptions. However IUCN noted that the legal status of this plan is uncertain and considered that there are significant challenges limiting the implications of the plan on the ground.

There is a serious risk that the management plan is largely a collection of recommendations. Following a request for further information the State Party provided a brief statement confirming that the plan had expired at the end of 2009. It confirms that an order has been made to develop a management plan that “would be based on the principles and categories of the management plan that lost its power.” IUCN considers that a fully developed and agreed management plan is required for the property.

The budget for the Tajik National Park in 2008 is estimated to be USD141,000. This is clearly insufficient to fully implement the management plan. The level of park staffing is c.100, representing a good basis for developing a larger management service. However IUCN notes that the levels of staffing are not adequate to fulfill the main management needs of the property: notably the park wardens have very large areas of difficult terrain to cover and without adequate vehicles, so that effective patrolling cannot currently be achieved. There is a lack of trained specialists and equipment to enable effective management of the property.

IUCN considers the management of the nominated property does not meet the requirements set out in the Operational Guidelines.

4.4 Threats and human use

IUCN's evaluation noted a range of threats to the property. There are clearly possible impacts from natural hazards, notably earthquakes, which whilst part of the natural values of the property could impact on park management and local populations living nearby. Sensors are in place to provide a warning system, although full emergency plans were not reviewed.

In relation to human impacts, there are five small villages nominated within the boundary of the property. There are larger populations of c.14,000 persons living within or adjacent to the buffer zone to the nominated property. Local residents use the scarce resources of the harsh mountain environment, including for firewood, livestock grazing, food and medicinal plants. There is no clear strategy on the consideration of the legitimate livelihood needs and the involvement of resource dependent local residents, which seems fundamental to an effective long term strategy for TNP. IUCN noted that the cutting of Teresken and other woody plants is a significant threat to the values of the property, and requires closer management and control.

The numbers of ibex and Marco Polo argali are reported to be at much lower numbers than 100 years ago, and this decline is attributed to past hunting impacts. Commercial hunting is currently under a moratorium in the nominated property, but appears to be permitted in the buffer zone. The continuation of the moratorium beyond the end of 2010 is also not yet confirmed. IUCN also understood that there are significant pressures on wildlife due to illegal hunting and collection. Very limited information was provided by the State Party in response to a request for clarification on this issue. The management of hunting, including trophy hunting requires further consideration. In particular, there is a need for assurance that the hunting schemes and practices will not threaten the viable populations of wildlife and that both conservation and local communities will economically benefit from the revenues. In addition to stronger and long-term legal protection, implementation of effective management in relation to these threats requires much greater and more effective staffing in relation to both patrolling, and also to consider management in relation to livelihood needs.

There are credible reports suggesting localized tourism impacts within the property, in particular as regards pollution in and around mountaineering camps. IUCN also requested information on possible road schemes affecting the property, but was not able to reach a definitive conclusion on their possible impacts, following a response from the State Party to a request for supplementary information. There is possible hydroelectric generation potential in the region, and dam construction or related infrastructure affecting TNP is likely to become a future concern.

The potential impacts of climate change have not been fully assessed, although there is already evidence that the nominated property could be more resilient in terms of impacts on glaciers than in many other regions.

In summary, IUCN considers the nominated property does not meet the conditions of integrity as set out in the Operational Guidelines.

5. ADDITIONAL COMMENTS

5.1 Comments of ICOMOS

ICOMOS provided comments on the cultural values of the property to IUCN, and considers that the full importance of the property in cultural terms is not set out in the nomination. They note that in the Pamirs, there is a wide range of evidence for human activity spreading back over 20,000 years. There is an urgent need to identify and evaluate the extensive known remains of Stone Age sites, cave paintings & petroglyphs, ritual sites, solar calendars, caravanserai, Buddhist remains and evidence of the Silk Roads trade, including some substantial remains of fortresses and castles. ICOMOS notes work already undertaken by the Academy of Sciences, and considers there is a need for a full survey of the cultural attributes of this archaeologically sensitive area in order to inform management and in order not to preclude further exploration and assessment of cultural sites in the future, some of which, either on their own or as a serial group, may have the capacity to justify cultural criteria.

6. APPLICATION OF CRITERIA

The Tajik National Park (Mountains of the Pamirs), Tajikistan, has been nominated under natural criteria (vii), (viii), (ix) and (x):

Criterion (vii): Superlative natural phenomena or natural beauty

The Pamirs are the third highest mountain ecosystem in the world after the Himalaya and Karakorum Ranges and include the largest valley glacier of the Eurasian Continent. The nominated property offers an unspoiled mountain wilderness at a scale surpassed only by Kluane/Wrangell-St. Elias/Glacier Bay/Tatshenshini Alsek in the Nearctic among existing World Heritage properties. There is no high mountain protected area in the Palearctic of comparable dimension. Among the many, often large, glaciers of the region, the Fedchenko Glacier is a spectacular example at the global level. The combination of some of the deepest gorges in the world, surrounded by rugged peaks and the breathtaking high plateaus meets in a dramatic display in the nominated property. However some important areas in relation to this criterion are located in the buffer zone to the nominated property.

IUCN considers that the nominated property meets this criterion, but its values would be greatly strengthened by consideration of areas located within Tajik National Park, in the area currently proposed as a buffer zone.

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

The nominated property boasts vast high plateaus in the east and rugged terrain with deep gorges in the west. The gorges are very deep, however the deepest ones, are not included in the nominated property but lie in its buffer zone and adjacent areas. The High Pamirs are a centre of glaciation on the Eurasian continent. Although other glaciation areas are larger in their total ice-cover, TNP hosts the largest valley glacier of the Palearctic biome. While global warming has led to a sometimes dramatic retreat of glacier streams in other mountain ecosystems of the continent, the melting process of glaciers in TNP is less dramatic. It is considered that high altitude and glacier size make glaciers of TNP more resistant to effects of global warming than other glacial territories in Himalaya and Karakorum. The boundaries of the nominated property do not fully encapsulate all of the features of greatest significance.

The Pamir highlands are subject to strong and frequent earthquakes and the highly active tectonics result in a geologically extremely active terrain. Among the most impressive results of this activity is Lake Sarez, near the centre of the nominated property. It was created by a landslide of an estimated six billion tons of material and represents one of the youngest large lakes in the world.

IUCN considers that the nominated property meets this criterion, but its values would be greatly strengthened by consideration of areas located within Tajik National Park, in the area currently proposed as a buffer zone.

Criterion (ix): Ecological processes

The nominated property is part of Udvardy's biogeographic province of the Pamir-Tien-Shan Highlands which are part of the Mixed Mountain Systems biome. Globally, mountains are already the dominant habitat type within natural World Heritage properties, with numerous mixed mountain systems inscribed on the World Heritage List. There are a number of existing properties which display less altered and more intact ecosystem processes in relation to mountain systems. Although there is a recognised gap on the World Heritage List for the representation of Cold Winter Deserts, the property does not represent the most significant or outstanding example of this biome in Central Asia. The property has regionally significant values which

would be strengthened through the establishment of more effective protective mechanisms.

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

Criterion (x): Biodiversity and threatened species

While the biodiversity of the Central Asian mountains is recognized as outstanding Tajik National Park alone does not appear to be the most biologically diverse and/or representative site of the broader area. Due to its high elevation, the property offers a low species diversity for both flora and fauna. While there may well be important information gaps for many species groups due to the remoteness and inaccessibility of the mountains, it seems unlikely that TNP's diversity can match or exceed that of existing high mountain World Heritage properties listed under this criterion. The same holds true as regards endemism. The nominated property does not compare favourably with other Tentative List sites in the region in relation to its biodiversity values despite its large size. TNP is home to only a small number of globally threatened species. The levels of threat to these values are of concern.

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

7. RECOMMENDATIONS

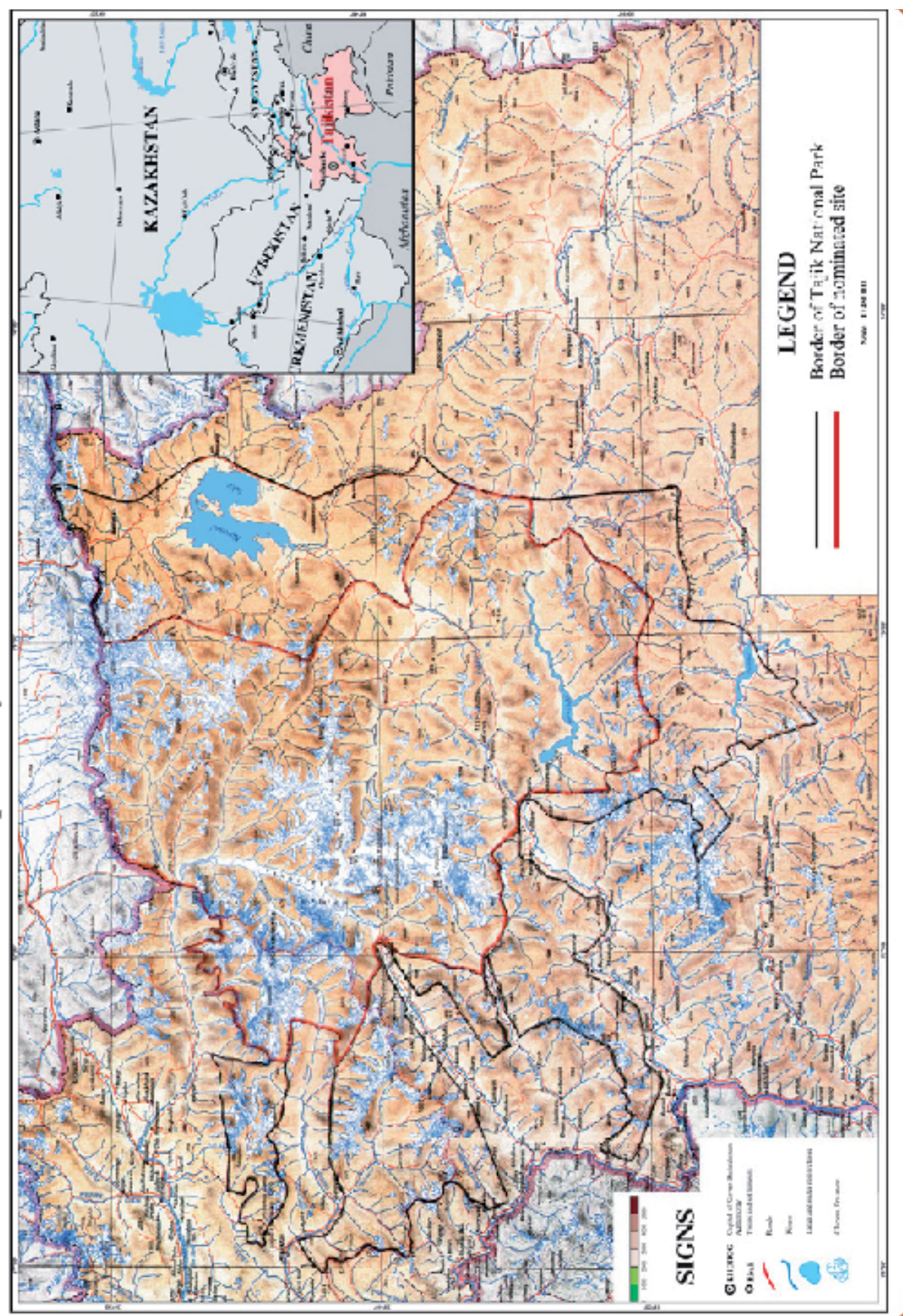
IUCN recommends that the World Heritage Committee adopt the following decision:

The World Heritage Committee,

1. Having examined Documents **WHC-10/34.COM/8B** and **WHC-10/34.COM/INF.8B2**,
2. Defers the examination of the nomination of the **Tajik National Park (Mountains of the Pamirs), Tajikistan**, to the World Heritage List on the basis of criteria (vii), (viii), (ix) and (x), to allow the State Party to refocus the nomination and address issues related to the integrity, protection and management of the nominated property;
3. Recommends the State Party to:
 - a) Refocus the nomination on the values and features within the Tajik National Park (Mountains of the Pamirs) in relation to criteria (vii) and (viii);
 - b) Enhance the global comparative analyses in relation to other World Heritage properties and protected areas, building upon the comparative analysis and thematic studies elaborated by IUCN and

- the UNEP World Conservation Monitoring Centre and considering requesting IUCN, through its network of experts, to facilitate advice;
- c) Re-consider the design of the boundaries of the nominated property and its buffer zone based on a clear rationale;
 - d) Provide a clear commitment and operational plan from the government that ensures effective long term protection and management, including the necessary human and financial resources, of the nominated property;
 - e) Further develop and implement a realistic management plan that addresses the livelihood needs of local residents (grazing, firewood) and existing and future threats, such as trophy hunting, road construction and tourism;
 - f) Consider jointly with neighbouring States Parties a future transboundary or transnational, potentially serial, nomination that would better represent the full range of biodiversity values of the Pamir Mountains and enhance the potential of the nomination in relation to criteria (ix) and (x).
4. Encourages communication and cooperation with the neighbouring State Party of Kyrgyzstan bordering the nominated property;
 5. Requests IUCN to advise the State Party on the management and nomination of Tajik National Park through its network of experts, in particular through networks and expert groups specialised in mountain protected areas;
 6. Encourages States Parties to the Convention to support efforts to manage Tajik National Park and further work on the deferred nomination, considering the above recommendations.

Map 1: Location and boundaries of Tajik National Park



EUROPE / NORTH AMERICA

PITONS, CIRQUES AND REMPARTS OF REUNION ISLAND

FRANCE



WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

PITONS, CIRQUES AND REMPARTS OF REUNION ISLAND (FRANCE) - ID N° 1317

Background note: This nomination was submitted in 2008 for consideration by the World Heritage Committee at its 33rd Session in 2009. Accordingly, IUCN initiated the evaluation of this nomination in 2008/9 and this included the evaluation mission to La Réunion. In March 2009, the decision was taken by the government of France to postpone the assessment of the nomination by UNESCO's World Heritage Committee until its 34th Session in 2010. This decision was required due to the fact that three nominations from France were proposed for consideration by the 33rd Session of the World Heritage Committee. The State Party of France had been requested by the UNESCO World Heritage Centre to identify two nominations in line with the limits on annual numbers of nominations set in the Operational Guidelines. As the evaluation process was already initiated by IUCN, a dialogue was maintained with the State Party to clarify a number of issues and address recommendations resulting from the evaluation mission, and discussions from the 2008 session of the IUCN/World Heritage Panel. This evaluation report is therefore based on the original nomination plus the additional information provided by the State Party.

1. DOCUMENTATION

- i) **Date nomination received by IUCN:** 31st January 2008
- ii) **Additional information officially requested from and provided by the State Party:** additional information was requested by IUCN in December 2008. Additional information from the State Party was provided in February 2009 and November 2009.
- iii) **UNEP-WCMC Data Sheet:** 8 references
- iv) **Additional Literature Consulted:** Gillet, H., R. Bishop, A. Smith and S. Blyth (1998). **A Global Overview of Protected Area on the World Heritage List of Particular Importance for Biodiversity. A contribution to the Global Theme Study of World Heritage Natural Sites.** WCMC, Cambridge, UK. Green, E., Harrison, J., Baltran, J., Conway, L., Martins, S. & Spalding, M. (2001). **A Global Overview of Tropical Marine, Coastal and Small Island Ecosystems and the World Heritage List.** Discussion Paper. UNEP-WCMC, Cambridge, UK. Thorsell, J., R.F. Levy and T. Sigaty (1997). **A Global Overview of Wetland and Marine Protected Areas on the World Heritage List. A contribution to the Global Theme Study of World Heritage Natural Sites.** IUCN, Gland, Switzerland. WWF and IUCN (1994-1995). **Centres of Plant Diversity. A Guide and Strategy for their Conservation. Volume II (Asia, Australasia and the Pacific).** IUCN Publications Unit, Cambridge, UK. Chris Wood. **World Heritage Volcanoes.** Gland, Switzerland: IUCN. 70pp.
- v) **Consultations:** 10 external reviewers consulted. The mission team met with the authorities and experts from the park, local government authorities, representatives and members of local communities, and scientists.
- vi) **Field Visit:** Wendy Strahm and Tim Badman. 17-24 October 2008.
- vii) **Date of IUCN approval of this report:** 22nd April 2010

2. SUMMARY OF NATURAL VALUES

The nominated property, Pitons, cirques and remparts of Reunion Island, is located in the Island of La Réunion, in the Mascarene Island group in the south-western Indian Ocean. La Réunion lies 750 km east of Madagascar and 200 km southwest of Mauritius (see Map 1). The island is made up of two volcanic massifs, the Piton des Neiges in

the northwest, a dormant volcano, and the Piton de la Fournaise, an active volcano in the southeast. The nominated property has an area of 105,838 ha which corresponds to the core area of La Réunion National Park and represents 42% of the total area of the island. The nominated property is surrounded by a buffer zone of 11,729 ha which includes the lower part of the volcanic cirques.

The volcanic island of La Réunion rises to 3,071 m in altitude, and is the youngest of the three Mascarene Islands, with an age of 2.1 million years. The climate is oceanic and subtropical, and the side of the island facing the southeast tradewinds and storms is very wet, with an annual total of up to 12 meters of rainfall. On the western half of the island in the rain shadow of the mountains, precipitation is between 1-2 m. The varied topography of the property creates many microclimates and a variety of ecological conditions.

The nominated property includes the middle and upper slopes and peaks of the two volcanoes and a linking section between them. The volcanic and erosional topography of the property is striking. Long linear and curvilinear escarpments known as “remparts” rise to 1,000m in places, surrounding erosional “cirques” in the flanks of the volcanoes, or adjoining the radiating streams. The peak of the Piton des Neiges lies at the centre of three such scarp-rimmed “cirques” of Salazie, Mafate, Cilaos and the infilled “palaeocirque” of Bébou. The Piton de la Fournaise rises to 2,632 m and is one of the world’s most continuously active volcanoes: it has erupted over 100 times since 1640. The summit crater of La Fournaise is encircled by the barren 8 km caldera of l’Enclos Fouqué, which has produced recent lava flows to the sea to the east over a forested and periodically renewed nine-kilometre apron of lava called the Grand Brulé. The Plaine des Sables, a large area of fine volcanic ejecta provides a dramatic barren volcanic landscape towards the top of the volcano. Volcanic features of the property include numerous dykes and sills, pit craters, cinder cones, solfataras, lava flows and basaltic sea cliffs.

Like all oceanic islands, its biodiversity is relatively low compared to comparable continental areas, but is typified by a high level of endemism. The steep altitudinal variation of the property supports a series of different habitats ranging from subtropical rainforest moving up into Pandanus thickets, cloud forest and heath on the windward side of the island, and through dry subtropical forest and steppes (the most threatened habitat types on La Réunion) on the leeward side.

La Réunion is considered a global Centre of Plant Diversity, where a third of the vegetation is forest, and it conserves the most extensive and best remnants of the natural vegetation of the Mascarene Islands. Its variety is due to topographic complexity, climatic variation, the abrupt altitudinal gradient and to the island’s oceanic isolation. There are 1,712 species of vascular plants, whilst of the 840 indigenous species, 389 (46.3%) are endemic, 236 being locally and 153 regionally endemic. 8 genera are endemic to Réunion, and 5 more endemic to the Mascarenes. There are also 754 species of bryophyte, 86 being endemic. Although altered by

human use, the levels of impact of human activity on the ecosystems of La Réunion are lower than elsewhere in the Mascarenes.

As for most remote islands, the vertebrate fauna is poor having less than 50 indigenous species. A significant number of these species are known to have become extinct since human settlement began in 1650, including a giant tortoise. However, the bird population has survived better than on other islands, since monkeys and mongoose were never introduced. Out of the 78 birds, 7 are endemic of La Réunion. Amongst recorded insects, 40% of the beetles and 25% of the 500 spiders are endemic. There are 500 species of butterfly including the endemic meadow swallowtail butterfly. Out of the existing 54 molluscs, 20 are endemic to La Réunion, and 24 more to the Mascarenes. There are also 21 freshwater fish, 9 freshwater crustaceans and 20 freshwater molluscs all of which are endemic. The property protects the areas that are important in sustaining these levels of biodiversity.

3. COMPARISONS WITH OTHER AREAS

The property has been nominated under all four natural criteria. The nominated property compares favourably with other volcanic properties that have been inscribed on the World Heritage List under Criterion (vii), such as Brazilian Atlantic Islands, Brazil; Cocos Islands National Park, Costa Rica; Galapagos Islands, Ecuador; and Komodo National Park, Indonesia. IUCN notes that external reviewers highlighted the striking landscapes of La Réunion as of key significant value of this nomination. The erosional landforms are dramatic with the scale of the remparts and the rapidity of processes clearly illustrated. The two peaks, with their great variety of rugged terrain of differing heights and aspects, and the visual impact of the escarpments, forested gorges and basins are of high aesthetic value.

In relation to criterion (viii) IUCN notes the large number of volcanic properties already included on the World Heritage List. Whilst the Piton de la Fournaise is notable for the frequency of its eruptions, IUCN considers that there are other more significant World Heritage properties exhibiting a much wider and significant variety of volcanic landforms or that are representative of volcanic processes such as the Isole Eolie (Italy) which has provided the scientific basis to understand two types of volcanic eruptions. The Kamchatka Volcanoes are one of the most extensive volcanic regions in the world, with both a high density of active volcanoes, and a variety of types and a high diversity of related volcanic features (geysers, mud pools, hot springs, and calderas). Hawaii Volcanoes National Park similarly provides a much more extensive example of volcanism, related to a hot spot, whilst the property does not display exceptional features such as the decorated lava tubes of Jeju Volcanic

Island and Lava Tubes, Republic of Korea. Whilst all volcanoes are “unique”, IUCN does not find a strongly distinctive basis for recognising the geological values of the nominated property as of Outstanding Universal Value.

In relation to ecosystem processes, IUCN notes that the vast tract of mostly intact forest stretching from sea level at Mare Longue to the summit of the Piton de la Fournaise is an exceptional survival within tropical islands in the Indian Ocean. There are a large number of distinct habitat types, plant succession has been studied in detail, and there are good examples of adaptive radiation and ongoing speciation. However the extreme pressure from invasive alien species, has completely disrupted ecological processes in many areas, and when natural vegetation disappears due to landslips, lava flows, or other factors, it is mostly replaced by more aggressive exotic species. The level of integrity impacts due to invasive species and past species extinctions argue against the application of this criterion. Aldabra, Seychelles, is, in contrast, a substantially intact example of such phenomena. IUCN further notes that other island ecosystems inscribed on the World Heritage List provide greater and more extensive examples of the process of island endemism, notably in Galápagos. Due to the proximity of Madagascar to the Mascarenes, the level of endemism is less than that of much more isolated island ecosystems, such as those of Hawaii.

IUCN considers that the case is stronger for the application of criterion (x) to the nominated property. The distinctive flora and fauna of the Mascarene Islands provides the basis of the establishment of Outstanding Universal Value, and the nominated property contains the most significant and important natural habitats for this biota. It can be argued that Mauritius, being an older island, has a somewhat richer flora and higher number of endemic species (plant and animal). However, what remains on Mauritius often numbers just a handful of individuals, whereas most of La Réunion endemics still have substantial populations. In addition a large number of species endemic to Mauritius and La Réunion are almost extinct on Mauritius yet are still common on La Réunion. The nominated property has a higher altitudinal range (over 3,000m compared to 828m in Mauritius), giving it additional habitat types that are largely intact. Given the high number of threatened species on the Mascarene Islands, the remaining natural habitats, which are included in the nominated property, are the most significant remaining for this unique flora and associated fauna.

In relation to inscribed World Heritage properties the values of the flora of the property are similar to those found on Socotra, Yemen, although the latter is larger and comprises four islands. Per unit

area, La Réunion is richer in plant species than the Hawaiian Islands and the Galapagos Islands, whilst protecting a different flora and fauna. The Seychelles properties of Vallée de Mai and Aldabra, are not comparable, being lowland, granitic islands, and much less rich in diversity and endemism than La Réunion.

4. INTEGRITY, PROTECTION AND MANAGEMENT

4.1. Protection

The nominated property coincides with that of La Réunion National Park, which was established in 2007, soon after the adoption by France of a new law (Law No. 2006-436) on national parks of 14 April 2006. Most of the National Park (c. 90%) is state owned, while the majority of the remainder is under various other forms of communal and public ownership. The property includes a small extension of private land (1.7%). The National Park contains two small strict nature reserves: the Saint Philippe-Mare Longue Reserve set up in 1981, covering 68 ha; and the Roche Ecrite Planèze Reserve, covering 3,643 ha, aimed at conserving the Critically Endangered Réunion Cuckoo-shrike.

Whilst the National Park is of recent creation, it is the result of a long process as conservation of nature started in 1958 with the establishment of the nature reserves. Conservation was further enhanced in 1977 with the implementation of a forest regime that promoted forest conservation activities, and also in 1982 through a process that lead to the assessment of all natural areas of particular interest in terms of ecology, fauna and flora. Through this process the conservation and management activities were better coordinated including with key local stakeholders.

The day-to-day management of the National Park is under the responsibility of an Administrative Council, drawing on comprehensive consultation with local, regional and state stakeholders, collectives and mayors. Management of the Park is supported by two Advisory Councils bringing together key managing bodies and stakeholder groups.

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

4.2 Boundaries

Following the evaluation mission and the assessment of this nomination during the IUCN World Heritage Panel (December 2008) a number of recommendations were proposed to the State Party for reviewing the boundaries of the nominated property both for enhancing the representation of its key values as well as for strengthening its integrity.

These recommendations were fully considered and implemented by the State Party. As a result the new boundaries of the nominated property were redefined to align them with the boundaries of the core area of La Réunion National Park. The revised boundaries include the key natural features that support the case of Outstanding Universal Value and comprise 96% of all remaining natural areas of La Réunion. The revised boundaries exclude major settlements, so as to avoid potential impacts associated to urban development plans. The buffer zone comprises the bottom of the cirques of Salazie, Cilaos and the Plaine des Palmistes which are settled areas, where agricultural and other uses are located. The new boundaries also includes provision for a transition zone which includes a number of natural areas that could be considered to further extend the boundaries of the National Park and for which there will be management provisions in the management plan of the National Park. IUCN considers that a number of small extensions would be desirable to ensure protection of some areas of relict vegetation in the middle and lower levels of La Réunion, as proposed by the State Party.

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

4.3 Management

The new law on national parks of 2006 requires that the management of each park is guided by a management plan combining conservation goals with local policies, and requires that such management plan is developed through a full participatory and consultative process with all key stakeholders. The time required for the preparation of the management plan may vary depending on local complexities. At present all new National Parks established under this law, including La Réunion, are in the process of preparing the management plan.

The Administrative Council of La Réunion National Park initiated the preparation of the management plan in May 2008 and a comprehensive consultative process started soon after in June 2008. The development of the management plan is the key priority of the Administrative Council and it is expected to be finalized by June 2010 and legally approved by a national decree by mid 2011. Once this decree is adopted, the management plan will have a validity of 10 years and, according to the provisions under the new law on national parks, the government will allocate the necessary human and financial resources to ensure its effective implementation. A draft of the management plan as well as key recommendations arising from the consultation process was included in the additional information provided by the State Party in November 2009. IUCN notes that the plan fully

considers the protection of the key natural features of the park, including those that support the case for Outstanding Universal Value as well as the required conditions of integrity. The management plan is also giving due consideration to issues of participatory management by local communities as well as how to balance nature conservation with traditional management practices of local people. Provisions within the draft management plan are already under implementation.

The draft management plan is also complemented by measures implemented through the Regional Land Development Plan, the Local Zoning Plan and the Forest Management Regime. All these plans have provisions for the conservation and management of the natural areas within the National Park, and there are coordination mechanisms between them including through the Administrative Council of the Park. Thus the draft management plan, supported by other legally binding regulations, effectively guides the management of the nominated property until the legal adoption of the management plan by mid 2011.

The implementation of management activities is supported by adequate financial and human resources: in 2009 the budget was Euro 8,09m; an increase of 25% over 2008. In 2009 85 permanent staff were in place within the National Park service. Other public sector actors also provide significant staffing for activities within the property, including through local government and the Forest Service. In addition a number of local NGOs and civil society groups provide support to conservation and management activities, and reflect a strong commitment from local communities towards this property.

IUCN notes that paragraph 115 of the Operational Guidelines recognise it is acceptable for a property to be inscribed whilst its management plan is being completed, provided a clear timetable for this is in place for this process. In the case of the property IUCN notes that there is already a process in place for finalizing the plan, and also a clear deadline (mid 2011) for its legal adoption.

IUCN considers the management of the nominated property meets the requirements set out in the Operational Guidelines, noting that the management plan should be completed and adopted by mid-2011.

4.4 Threats

Invasive alien species

The greatest threat to the values of the property is the large number of invasive alien species, both animals and plants that needs to be controlled and/or eradicated. They are most intrusive in the semi-arid, lowland and mid-level forests, and the invasive

plants include some of the most problematic and pervasive known invasive species. Eight alien mammals areas are also present including deer, rats, dogs and cats.

IUCN requested the State Party to provide additional information on this issue and in particular on the need to develop and implement a comprehensive strategy to control and eradicate invasive alien species (IAS). In response the State Party informed IUCN that a technical workshop on IAS was implemented in November 2008 which identified the key elements to consider in a comprehensive strategy to control and eradicate invasive alien species. The recommendations from this workshop have been validated with different institutions and local stakeholders and have resulted in an Action Plan to address IAS. This Action Plan proposes the priority activities that the National Park and other institutions, such as those dealing with forest management, should implement. In order to coordinate the implementation of this plan, a permanent technical position to deal with IAS has been established in October 2009 under the Regional Directorate for the Environment (DIREN).

A number of institutions are working on IAS issues and the financial resources allocated to this work is in the order of Euro 8m per year. In addition the regional government has invested EURO 950,000 to the development of a number of technical studies on how to deal with different invasive alien species. Furthermore the regional government requested a new credit within the framework of Biodiversity Strategy of France to enhance the work on IAS. This request has been approved and from 2009 onwards an additional Euro 220,000 will be granted for this work. A number of actions have been already successfully implemented such as the eradication of cats and rats in the Nature Reserve of la Roche Ecrite affecting nesting areas of La Réunion Cuckoo-shrike, a forest bird endemic of the island. Since 2009 a plan to eradicate cats and rats affecting the Barau's petrel and the Bourbon's black petrel have also been under implementation.

IUCN considers this is a strong response, but notes that long term continuing commitments will be required at this, and possibly greater levels to fully manage the threat of IAS to the nominated property.

Urban development and population pressures

The island is heavily populated and population pressure is increasing rapidly, especially in the coastal plain. Aside from the cirque areas, most of the interior of the island is not settled. The effective implementation of existing development plans, including policies to protect the property from development, and the conservation and management of the National Park management

plan, coupled with the implementation of environmental awareness programmes provide effective responses to this threat, and should be continued and provided with ongoing adequate resources.

Tourism management

Tourism is provided for by a wide variety of activities: hang-gliding, paragliding, riding, rafting, whitewater kayaking, mountaineering, rock climbing, trekking, camping and picnicking. In 2005 the estimated number of tourists to La Réunion numbered 603,000; many visiting the beaches which are not within the nominated property. Sightseeing and trekking within the property is growing in popularity and there is a road access to viewpoints on the Piton de la Fournaise, which is a prominent feature across the Plaine des Sables. There are a number of hostels in and around the property, which are also served by vehicle tracks. There are a number of regulations in place to control the impacts resulting from tourism which is supported by environmental awareness programmes with tourism operators and local communities. Environmental education is also a central feature in the work of the existing visitors' centre at la Grande Chaloupe at the northernmost end of the National Park near the coast and the capital, St.Denis. In addition, as part of the process for preparing the management plan for the park, a new tourism development strategy will be developed and implemented which considers the heritage values of the nominated property. IUCN considers that the provision for tourism management within the property is good, with positive plans for improvements. Amongst these, IUCN recommends that the State Party examine options to reduce the visual impact of the road across the Plaine des Sables, including through regulations on traffic.

Geothermal energy

The nominated property includes areas that are considered to have potential for the production of geothermal energy. A project to develop a geothermal energy facility on the Plaine des Sables, which could have had a major impact in terms of the natural values and visual qualities of the property was reviewed during the IUCN mission. However IUCN has received written confirmation from the State Party that this project has been abandoned, taking account of the priority for conservation of the heritage values of the nominated property.

In summary, IUCN considers the nominated property meets the conditions of integrity set out in the Operational Guidelines.

5. OTHER COMMENTS

5.1 Comments from ICOMOS on cultural values

ICOMOS provided comments to IUCN on associated cultural values of the nominated property. ICOMOS noted that the property has a history of plantations and of the use of slaves and particularly of maroons, sheltering in remote areas. Thus, the property has similarities with the inscribed property of Le Morne Cultural Landscape, Mauritius. However, ICOMOS does not consider that the association of the property with maroons is sufficiently significant to justify consideration of cultural criteria. Nevertheless, ICOMOS encourages the State Party to continue to respect the human histories of the park area, including the cultural value of the cirques, in the management of the property and to support activities such as the Écomusée-Salazie and the Maison du Peuplement des Hauts in Cilaos that valorize Creole heritage.

6. APPLICATION OF CRITERIA

The Pitons, cirques and remparts of Reunion Island has been nominated under all four natural criteria.

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

The combination of volcanism, tectonic landslide events, heavy rainfall and stream erosion have formed a rugged and dramatic landscape of striking beauty, dominated by two towering volcanoes, the dormant Piton de Neiges and the highly active Piton de la Fournaise. Other major landscape features include “remparts” - steep rock walls of varying geological age and character, and so-called “cirques”, which can be described as massive natural amphitheatres with an imposing height and verticality. There are deep, partly forested gorges and escarpments, with subtropical rainforests, cloud forests and heaths creating a remarkable and visually appealing mosaic of ecosystems and landscape features.

IUCN considers that the nominated property meets this criterion.

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

The nominated property includes two contrasting volcanic landforms, displaying a range of different volcanic features, and their excision through rapid erosion display both their internal structure, and a range of erosional processes and landforms. However the scale of the property is greatly exceeded by other inscribed volcanic landscapes, and nor does the property display evidence of the level of global scientific contribution identified in other World Heritage properties. The property is

not one of the significant remaining gaps identified in IUCN's theme study on volcanoes and the World Heritage List. Although the volcanic nature of the island, and its varied geomorphology are intrinsic underlying elements of its scenic qualities and biodiversity values, they are not sufficiently distinctive or significant to demonstrate Outstanding Universal Value.

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

Criterion (ix): Ecological processes

Whilst there are some exceptional survivals of ecosystems within tropical islands in the Indian Ocean and a large number of distinct habitat types, the extreme pressure from invasive alien species, has completely disrupted ecological processes in many areas of the property, and is ongoing. The level of integrity impacts due to invasive species and past species extinctions argue against the application of this criterion. Existing island ecosystems inscribed on the World heritage List are variously more intact, more extensive and display more clearly the processes of island endemism. These features are certainly of international importance, but not at the level to be recognised as being of Outstanding Universal Value.

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

Criterion (x): Biodiversity and threatened species

The property is a global centre of plant diversity with a high degree of endemism. It contains the most significant remaining natural habitats for the conservation of the terrestrial biodiversity of the Mascarene Islands, including a range of rare forest types. Given the major and partly irreversible human impacts on the environment in the Mascarene archipelago, the property serves as the last refuge for the survival of a large number of endemic, threatened and endangered species.

IUCN considers that the nominated property meets this criterion.

7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents **WHC-10/34.COM/8B** and **WHC-10/34.COM/INF 8B2**

2. Inscribes the **Pitons, cirques and remparts of Reunion Island, France** on the World Heritage List under natural criteria (vii) and (x);
3. Adopts the following Statement of **Outstanding Universal Value**:

Brief synthesis

The Pitons, cirques and remparts of Reunion Island coincides with the core zone of La Réunion National Park. The property covers more than 100,000 ha or 40 % of La Réunion, an island comprised of two adjoining volcanic massifs located in the south-west of the Indian Ocean. Dominated by two towering volcanic peaks, massive walls and three cliff-rimmed cirques, the property includes a great variety of rugged terrain and impressive escarpments, forested gorges and basins creating a visually striking landscape. The property harbours the most valuable natural habitats and the species assemblages they support remaining on the Mascarene Island group. It protects key parts of a recognized global centre of plant diversity and features a remarkably high level of endemism across many taxa. Thereby, the property is the most significant and important contribution to the conservation of the terrestrial biodiversity of the Mascarene Islands.

Criteria

Criterion (vii): *The combination of volcanism, tectonic landslide events, heavy rainfall and stream erosion have formed a rugged and dramatic landscape of striking beauty, dominated by two towering volcanoes, the dormant Piton de Neiges and the highly active Piton de la Fournaise. Other major landscape features include “remparts” - steep rock walls of varying geological age and character, and so-called “cirques”, which can be described as massive natural amphitheatres with an imposing height and verticality. There are deep, partly forested gorges and escarpments, with subtropical rainforests, cloud forests and heaths creating a remarkable and visually appealing mosaic of ecosystems and landscape features.*

Criterion (x): *The property is a global centre of plant diversity with a high degree of endemism. It contains the most significant remaining natural habitats for the conservation of the terrestrial biodiversity of the Mascarene Islands, including a range of rare forest types. Given the major and partly irreversible human impacts on the environment in the Mascarene archipelago, the property serves as the last refuge for the survival of a large number of endemic,*

threatened and endangered species.

Integrity

Building upon earlier forest and nature conservation efforts, La Réunion National Park was established in 2007. This status provides an adequate legal framework to ensure the protection of the property, whose boundaries coincide with that of the national park. The boundaries of the property encompass the exceptional features of the natural landscape, as well as almost the entire remaining natural or close-to natural ecosystems remaining on La Réunion and thus the key biodiversity values.

The integrity of the property is subject to a range of threats. Despite ongoing management efforts, invasive alien species are a permanent management challenge posing a very real threat to the biodiversity values of the property. Evidence of past losses of many native species on La Réunion and on other islands of the Mascarene archipelago underlines the severity of this threat.

Management and protection requirements

The property benefits from effective legal protection through its designation as a National Park. Ensuring the Outstanding Universal Value of the property requires an effective and adaptive implementation of the evolving management plan for La Réunion National Park, and adequate long-term staffing and financial resources. The management of the national park draws on comprehensive consultation with governmental and civil society stakeholders and benefits from structured on science, research, socio-economics and cultural issues. Meaningful and effective consultation with all of the concerned stakeholders, including communities who live within its buffer zones and surrounding areas, is indispensable.

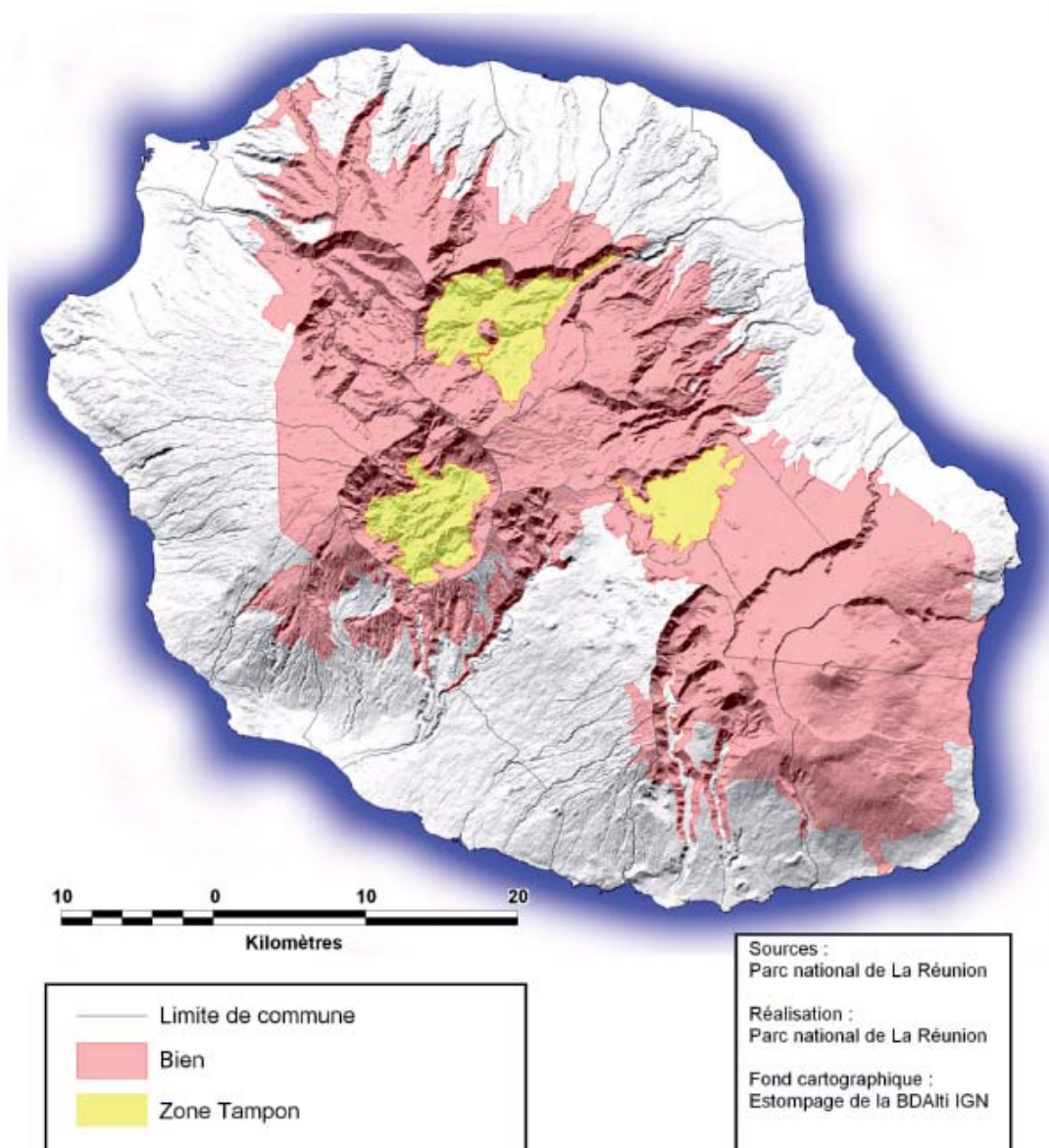
Actions are required in response to a number of specific threats, to ensure the maintenance and enhancement of the Outstanding Universal Value. Efforts to reduce invasions, permanent monitoring, and the implementation of a comprehensive strategy to control and eradicate invasive alien species are indispensable and will require long-term and continuing efforts and significant ongoing funding. While the rugged terrain provides a degree of natural protection against encroachment and human economic activities, such as agriculture, forestry, energy production and tourism; must be managed both in the property and

its buffer zone in a way that is not in conflict with the integrity of the property.

The development and effective implementation of a comprehensive tourism development strategy addressing the strong demand is also necessary. There is fine balance between positive economic and educational effects and destructive impacts from excessive numbers of tourists and inappropriate activities, and thus tourism strategies will clearly need to prioritise the protection of the values of the property, alongside economic goals.

4. Commends the State Party for the decision to abandon the project on geothermal energy, considering the need to maintain the Outstanding Universal Value of the property;
5. Also commends the State Party for the consultative process that has been put in place for preparing the management plan for the property and takes note, that although the property does not currently have a completed management plan in place, that the State Party will legally adopt the management plan for the property in 2011;
6. Requests the State Party to ensure that the future management plan addresses all of the integrity, protection and management requirements necessary to ensure the long-term conservation and enhancement of the Outstanding Universal Value of the property, and further requests that a copy of the management plan is provided to the World Heritage Centre and IUCN, when finalized and entered into force;

7. Further requests the State Party to ensure the effective implementation of the Action Plan for the Control and Eradication of invasive alien species, in full integration with the management plan for the property, considering the critical nature of this threat to the Outstanding Universal Value and also requests the State Party to submit to the World Heritage Centre by **1 February 2013**, a report on the state of conservation of the property, for examination by the Committee at its 37th session;
8. Also requests the State Party to ensure that sufficient human and financial resources continue to be provided for the effective implementation of the management plan for the property as well as for the implementation of actions for the control and eradication of invasive alien species;
9. Recommends the State Party to share lessons learned on eradication and management of alien species with other relevant States Parties, World Heritage properties and island protected areas facing similar challenges;

Map 1: Boundaries of the nominated Property and Buffer Zone**Figure 2** Carte définitive du Bien proposé et de sa zone tampon (fév. 09)

A. Natural Properties

A2 Deferred Nominations of Natural Properties

EUROPE / NORTH AMERICA

DINOSAUR ICHNITES OF THE IBERIAN PENINSULA

PORTUGAL / SPAIN



WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

DINOSAUR ICHNITES OF THE IBERIAN PENINSULA, (PORTUGAL/SPAIN) ID Nº 1204rev

Background note: A nomination entitled Dinosaur Ichnites of the Iberian Peninsula (IDPI), prepared by Spain, was deferred by the World Heritage Committee at its 30th Session (Vilnius, 2006). This nomination consisted of a series of over 200 component parts, and was located only on the territory of Spain. The relevant elements of decision 30 COM 8B.26 recommended that the State Party reconsider the potential to strengthen the possible case for Outstanding Universal Value of the nomination, giving particular attention to: (a) a definition of a more focused conceptual framework that clearly demonstrates the relationship of dinosaur ichnite sites in Spain to other important fossil sites in Portugal; (b) a thorough, global comparative analysis, including justification for a property based on dinosaur ichnites to be considered as being of Outstanding Universal Value; and (c) a serial nomination, which is coherent and manageable, focused around a much smaller number of localities and with all the elements selected relating to global significance. Subsequent to the consideration of IDPI, two nominations of properties related to dinosaur ichnites were submitted by Bolivia (Cal Orck'O, 2007) and Korean Cretaceous Dinosaur Coast (Republic of Korea, 2009). In both cases IUCN recommended that the properties should not be inscribed on the World Heritage List, as they did not meet criterion (viii), and in the case of Cal Orck'O also did not meet requirements for integrity, protection and management. Both were withdrawn by the relevant States Parties and were not considered by the World Heritage Committee.

1. DOCUMENTATION

- i) **Date nomination received by IUCN:** 15th March 2010
- ii) **Additional information officially requested from and provided by the States Parties:** IUCN requested supplementary information from the States Parties following its World Heritage Panel in December 2009. A response was provided in February 2010.
- iii) **UNEP-WCMC Data Sheet:** Draft prepared based on nomination document, finalisation dependant on further consideration of the nomination. Relevant datasheets were consulted related to other fossil related properties.
- iv) **Additional Literature Consulted:** In addition to the current and past fossil site nominations a range of published references were consulted, including 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.; Thulborn, A. (1990). **Dinosaur Traces**. Chapman and Hall, London, 394pp.; Dingwall, P., Weighell T. & Badman, T. (2005) **Geological World Heritage: A Global Framework**. IUCN / WCPA; Santos, V.F., Moratalla, J.J. and Royo-Torres, R. (2009) **New Sauropod Trackways from the Middle Jurassic of Portugal**. Acta Palaeontol. Pol. 54 (3), 409-422.; Wells, R.T. 1996. **Earth's Geological History: A Contextual Framework for Assessment of World Heritage Fossil Site Nominations**. IUCN, Gland.; Currie, P.J., Badamgarav, D., and Koppelhus, E B (2003) **The First Late Cretaceous Footprints from the Nemegt Locality in the Gobi of Mongolia**. Ichnos, 10:1–12.
- v) **Consultations:** 8 external reviewers consulted. The IUCN evaluation mission met with a wide range of representatives of the States Parties, including at ministerial levels, and in local government. A range of scientists, site management experts, and community and business representatives was also met, in both Spain and Portugal, together with representatives of the relevant UNESCO Commissions.
- vi) **Field Visit:** Patrick McKeever and Thora Amend, November 2009.
- vii) **Date of IUCN approval of this report:** 15th May 2010.

2. SUMMARY OF NATURAL VALUES

The nominated property comprises 11 component parts situated in six autonomous regions of Spain, as well as three components in central Portugal. The names, areas and locations of the components are shown in Table 1 below.

The landscape setting of the component parts varies. In Catalonia the setting is high in the foothills of the Pyrenees. The component in Aragón lies within the Maestrazgo Global and European Geopark. The components in La Rioja are found in the sierras or in the narrow valleys that flow toward the Ebro, whilst those of Castilla y León are all located in on a high plateau (“meseta”) characterised by scarce vegetation. In Asturias, the components are situated on the seashore, generally on the cliffs or on the scree at their foot. The location is a very dynamic one with much evidence of storm erosion. Valencia hosts an IDPI component in a dry plateau landscape. Two of the Portuguese components are inland and one is coastal. The Pedra da Mua component is coastal and generally inaccessible as the trackways are found on a steeply dipping cliff-face. The trackways of the Pedreira do Galinha and the Vale de Meios components are found on large expanses of bedding surfaces in quarries. Whilst the former is abandoned, the latter is still in community artisanal use. Both components are within the confines of the Serras d’Aire e Candeeiras Natural Park.

The trackways of the IDPI cover a large part of the Mesozoic era ranging from the Middle Jurassic (in Portugal, at Pedreira do Galinha and Vale de Meios) to the Upper Cretaceous (in the northeastern parts of Spain, at Tambuc and Fumanya). They cover a range of mostly coastal to marginal lacustrine environments and include representatives of most of the major groups of dinosaurs. Pedreira do Galinha

shows sauropod trackways whereas Vale de Meios displays numerous theropod trackways. Pedra da Mua contains theropod and sauropod trackways. In Asturias, the trackways are interpreted as having been made by ornithopods, sauropods, theropods and thyreophora (stegosaurus). In terms of tectonic setting these four components have been placed together into a so-called geological domain conceptually identified in the nomination as “Dinosaur Coast”, which represents the Iberian Jurassic. Up until the end of the Jurassic, Iberia formed a bridge between Laurentia and Gondwana as the former Pangaea split up. For the Jurassic-Cretaceous transition, the Iberian plate, as with much of Europe to the north, would have comprised a series of islands with periodic faunal interaction dependent on varying sea levels. Identified conceptually as “A Changing World” the trackways of Fuentesalvo, Las Cerradicas, Costalomo, El Peladillo and Los Cayos contain the dynamic evidence of theropods, sauropods and ornithomimids. By the close of the era of the dinosaurs, the Iberian plate had fused with Europe and the trackways of this time, from the so-called “End of an Era” as it is termed in the nomination, represent groups of theropods, ornithomimids and sauropods.

The trackways of the IDPI represent almost all of the main groups of dinosaurs and they record some of the evolutionary processes affecting these animals that have been deduced from the bone fossil record such as the changing gait of sauropods through the Mesozoic. Many of them show high quality levels of conservation, or particular types of behaviour. Distinctive features of the component parts include preservation of the fine border of displaced sediment formed as the animal’s foot pushed it aside (Pedreira do Galinha), herding behaviour among sauropods (Pedra da Mua), gregarious behaviour among ornithomimids

Table 1: Component parts and buffer zones of the nominated property (source: UNESCO inventory).

Name of the area	State Party/ Region	Nominated area (ha)	Buffer zone (ha)
Pedreira do Galinha	Portugal : Lisboa e Vale do Tejo (NUTII) / Santarém	4.08	93.78
Vale de Meios	Portugal : Lisboa e Vale do Tejo (NUTII) / Santarém	1.14	20.95
Pedra da Mua	Portugal : Lisboa e Vale do Tejo (NUTII) / Setúbal	8.09	31.24
Tereñes	Spain : Principado de Asturias	5.35	5.64
Fuentesalvo	Spain : Castilla y León	0.0044	3.2715
Las Cerradicas	Spain : Aragón	0.0065	0.9085
Costalomo	Spain : Castilla y León	0.2025	16.2566
El Peladillo	Spain : La Rioja	0.4231	0.855
Los Cayos	Spain : La Rioja	0.2353	0.267
Tambuc	Spain : Comunidad Valenciana	1.8625	1.8276
Fumanya	Spain : Cataluña	6.456	29.274
TOTAL		27.8503	232.1224

and skin impressions (Tereñes), pack behaviour among theropods (Fuentesalvo), exceptionally well preserved prints of theropods (Costalomo), evidence of webbed-footed ornithopods (El Peladillo) and the tail tracks of theropods (Los Cayos). Some of the trackways are displayed on near-vertical faces, and the larger components, such as those at Fumanya, are among the most extensive single localities demonstrating dinosaur trackways in the world. Some of the trackway-bearing surfaces are large. Pedreira do Galinha covers 40,000m² and contains hundreds of sauropod prints forming at least 20 individual trackways (one up to 147m long). It shows manus (forelimb) prints with a clear clawed thumb mark which is now adding new evidence to the morphology of the forelimbs of dinosaurs from this stage of the Mesozoic.

The nominated property has undergone a great degree of study over the last four years. All components are now well documented and can provide evidence of a range of behavioural traits such as herding and migration. The IUCN mission reviewed a number of recent and specific studies being undertaken at several of the component parts of the property.

3. COMPARISONS WITH OTHER AREAS

The approach to the evaluation of fossil footprint sites has also been the subject of past discussion by the World Heritage Committee, and IUCN takes note that a critical request in Committee decision 30 COM 8B.26 was for a thorough, global comparative analysis, including justification for a property based on dinosaur ichnites to be considered as being of Outstanding Universal Value.

IUCN notes that unlike body fossils, which are the static remains of dead animals, trace fossils (or "ichnites") are sedimentary structures made by living animals. They are thus the dynamic remains and as such they can tell us directly about the behaviour of the living animal and give insights into how they lived. The same animal or indeed the same foot can be represented by various types of trackway and print dependent on such things as substrate conditions, speed of movement of the animal at the time and subsequent erosion. Nevertheless, tracks and traces, correctly studied and interpreted can and do provide information regarding the record of life that bone fossils cannot. IUCN however notes that this does not provide on its own a compelling reason for inscription of a property on the basis of dinosaur ichnites alone. IUCN has also previously noted in its consideration of Cal Orck'O that inscription of a property on the basis of trackways alone would represent a very significant narrowing of the basis for inscription of fossil sites. The reasoning for this includes consideration that the physical and trace fossil

records of dinosaurs are complementary, and that whilst major concentrations of dinosaur body fossils are rare, there are a much larger numbers of broadly comparable footprint localities. This is evidenced by the range of World Heritage nominations that have been put forward in recent years, which contain substantial lists of comparable properties.

The property is compared to three properties currently inscribed on the World Heritage list that exemplify the same time period as the IPDI. These are Dinosaur Provincial Park, Canada, the Dorset and East Devon Coast, UK and Ischigualasto-Talampaya, Argentina, as well as a range of other known sites and areas included on tentative lists. In all cases the comparison is restricted solely to the presence or absence of dinosaur ichnites. In comparing tentative list sites, for example, it is stated that the only properties comparable with the IDPI are those where ichnites are one of the main resources (two sites) or where ichnology is the main resource (one site). The comparison does not attempt to compare the overall palaeontological significance of the nominated property with that of the existing or potential World Heritage properties.

IUCN requested further information from the States Parties regarding a number of aspects of the comparative analysis of the property. One notable statement in the response is that "there are only three properties relating to dinosaurs (none featuring ichnites) on the World Heritage List: Hence, today there is no property explicitly related to dinosaur tracks on the World Heritage List." IUCN considers that implicit in all of its previous evaluations is the concern that simply seeking representation of ichnites on the World Heritage List was not a sound basis for establishing Outstanding Universal Value. IUCN further notes that the statement that none of three existing World Heritage properties contains ichnites is factually incorrect, since the Dorset-East Devon has well known and studied trackways from the Jurassic Cretaceous boundary on the coast and nearby, and Ischigualasto-Talampaya describes ichnites in the nomination, although not in detail. Only two ichnites are reported from Dinosaur Provincial Park, although ecological relations have been reconstructed from its body fossil record.

Exceptional combined associations of dinosaur bones, skeletons and footprints together are also known from sites not included on the World Heritage List. For instance at Negemt, Mongolia the two types of resources are found together: Isolated bones and skeletons are found in the layers immediately above the footprints, and footprints are even found in the same layers as the bones. IUCN also notes that amongst other fossil World Heritage properties, Joggins Fossil Cliffs, Canada also combines the most exceptional known record of Carboniferous fossils of plants and animals, with a rich trace fossil record, including ichnites. In

summary, despite the provision of supplementary information, the comparative analysis does not provide the requested evidence, based on thorough global analysis, that a property based on dinosaur ichnites alone can be considered as being of Outstanding Universal Value, as it is based on an assumption that the comparison should only be carried out based on the ichnite values of fossil properties. IUCN considers this approach to fundamentally flawed and unsatisfactory.

In relation to the comparisons related solely to dinosaur ichnites, comparisons are made based on an analysis of “places around the world internationally known for their palaeontological richness as concerns dinosaur tracks”. From this analysis, the five “foremost ichnological provinces in the world” are identified: El Peladillo, (Spain); Cal Orck’o, (Bolivia); Vale de Meios (Portugal); Yeosu (Korea) and Purgatoire (USA). All of these are in the Global Network of Dinosaur Tracksites (GNDT). Two of these, El Peladillo and Vale de Meios, are components of the nominated IDPI property. Comparisons are then made based on hypothetical radius of 400 km on each “mega site”. IUCN requested supplementary information on this approach. The information indicates the development of the methodology through papers that have been mainly published by researchers associated with the nomination. In explaining why a 400 km radius was chosen around El Peladillo and Vale de Meios, the information notes that in addition to purely geological and geographical considerations, “a degree of political-administrative issues were considered in the methodology”. IUCN finds the decision to adopt a radius from the inscribed property as a basis for comparative analysis to be flawed. This is fundamentally because it leads to a comparison that includes values that are substantially outside the boundaries of the nominated property in the comparison, but also because it does not consider the actual values of potential alternative properties. The radius chosen is also tied to the particular configuration of the nominated property and the geography of Spain and Portugal, which privileges the geography of the nominated property in selecting the comparative method. The stated consideration of political aspects in designing the methodology is highly problematic and also suggests the methodology is not fully objective.

The conclusion of the comparative analysis presented notes that there are “other world geosites [which] have scientific relevance enough to complete the dinosaur evolution according to their tracksites”, and specifically mentions Cal Orck’o, Bolivia, Yeosu (Republic of Korea), Lark Quarry (Australia) and Purgatoire (United States). Axiomatically, this implies that the IDPI property is one among several globally significant sites in terms of dinosaur ichnology. This fully compromises the

case made for Outstanding Universal Value of the nominated property.

4. INTEGRITY, PROTECTION AND MANAGEMENT

4.1 Protection

The nomination summarises a complex range of European, national and sub-national systems for legal protection of the components of the nominated property, which include European directives, national laws, regional land-use planning systems and provisions in management plans. These provisions vary from between the States Parties and from region to region and component to component. Having considered these arrangements during the evaluation mission, IUCN is of the view that the provisions, whilst complicated, are effective at the level of the individual components. Two of the component parts (Funtelsalvo and Fumanya) are privately owned, whilst the remainder is in public or community ownership. Legal protection extends to the privately owned components.

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

4.2 Boundaries

The areas of the core and buffer zones have all been clearly delineated and ownership has been thoroughly determined. The boundaries are however questionable in terms of the opportunities for future discoveries. Given the delineation of the boundaries for the property and buffer of the sites within the proposed nominated property, there is little opportunity for ongoing discoveries. There may be some exception at the coastal sites where natural erosion processes may reveal new discoveries and also at the active quarry sites where anthropogenic activities may reveal new discoveries. The boundaries of the nominated property and of the buffer zones are for the most part straight-line boundaries, bearing no direct relationship to topographic contours or natural features.

The components selected for inclusion in the nominated property are all dinosaur ichnite sites. In the descriptions within the nominations, including in the draft Statement of Outstanding Universal Value, reference is made to the scientific value of “associated” direct evidence of dinosaurs, such as bones, at sites some distance from the nominated site. These remains are however not included in the nominated property. Thus it is difficult to accept that the property as nominated meets the definition of integrity in the Operational Guidelines in relation to the inclusion of all elements necessary to convey

Outstanding Universal Value. IUCN further notes that a number of the nominated components are extremely small, for instance Funtosalvo, which is a rock exposure of 7mx4m with 77 footprints, creating concerns about their long-term viability as an enduring record.

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

4.3 Management

Management of the proposed serial World Heritage property as a single entity is not currently in place. A coordination commission has been created to draw up and implement a joint management plan for the IDPI sites. This commission reflects the interests of the two state parties as well as the autonomous communities in Spain and includes political and technical representatives. There is no reason to believe that this commission would not be effective in implementing a coordinated approach to management and it is at present working on identifying ways and means of doing so.

There is no single management plan for the property. There is an overall palaeontological intervention plan, but it applies to a wider range of localities than those in the nominated property. A set of integrated management principles is being drawn up, but it is not made clear whether this intended to be formulated as an official management plan. Nor is it yet fully clear what the legal status, approval mechanism, duration, review and revocation processes etc. of any such plan would be, and whether it would be subject to stakeholder consultation. It appears that component-level management is effective, but without an overall and agreed management system it is difficult to ensure that management standards are consistent and uniformly applied throughout the property. This is particularly the case given the complex range of actors involved in the property.

In terms of monitoring, there is a set of conservation indicators and associated systems for on-site sampling, laboratory studies, trials, vulnerability assessment and individual conservation measures. A general technical conservation and restoration plan has also been drafted. Administrative arrangements for monitoring and restoration differ among the components, there is no indication of any purposeful implementation of them according to uniform measures, nor are there details of timing and programming.

IUCN considers the management of the nominated property does not meet the requirements set out in the Operational Guidelines, although management of its individual components appears to be satisfactory at the present time.

4.4 Threats

The nomination provides a comprehensive discussion of the state of conservation of the property and threats to it. It notes that there are many risks faced to the long-term survival of the tracksites due to weather and action of the sea and rivers. Atmospheric and biological agents play an important role on the conservation conditions of the dinosaur ichnite sites (sun, wind, differences of temperature, water...). In the case of the IDPI nomination, the main threats are due to the coastal locations of Pedra da Mua and Tereñes, from river erosion at Tambuc and from frost action at Fumanya. The other components, with the exception of Las Cerradicas, are exposed to the elements to varying degrees. As with trackway sites elsewhere in the world, active erosion may of course reveal new sites as well as destroying existing ones.

In addition to impacts from weathering and erosion, there are some reported threats relating to public works (paved roads, forest roads, paths, railways etc.), large reservoirs, land consolidation and new irrigation, mining and livestock endeavours etc. Several components have their boundaries at the very shoulder of the road, making them vulnerable to damage from the use of heavy machinery. All of the sites have public access although at some, such as Tereñes, Pedra da Mua and Fumanya it is more difficult than at others, such as El Peladillo. Effective, and often low-key interpretation is provided on site, complemented by information in visitor centres and museums. Whilst there are risks from public access, there is not significant evidence of visitation leading to damage to the components of the property.

At Costalomo, the exceptional degree of preservation of the unique trackway casts has led to the prints being covered by palaeontologists and conservers with a tarpaulin sheet and then covered with mud and thus hidden from view until a more permanent way of displaying and preserving these prints is in place.

At Vale de Meios, the trackways are preserved on a single bedding surface that was discovered due to the quarrying of the limestone for use in the famous Calçada pavement. This ongoing quarrying activity is small-scale and of artisanal character. The community-owned quarry continues its operation in very close coordination with the scientific community. There are four labourers on-site know that their activity can and will be stopped according to Portuguese law at any time defined by the scientists. There is some cause for concern, though, because the newer part of the trackway is also the surface over which machinery must move to retrieve the stones from the quarry. Scientists met by the mission consider that the risk of damaging the tracks by the quarry activities,

is outweighed by the continued excavation of new trackways. IUCN considers, in principle and consistent with both its past assessments and the consideration of the World Heritage Committee, that the combination of a natural World Heritage property with quarrying activity is not appropriate. Whilst the activity is acknowledged to be artisanal in nature, the inclusion of this component within the property does not correspond to expected levels of integrity in natural World Heritage properties. IUCN considers that there are other alternatives to both provide protection and recognition to sites where palaeontological excavation is combined with extractive activities.

In summary, IUCN considers the nominated property does not meet the conditions of integrity or requirements for protection and management set out in the Operational Guidelines, due to a combination of inappropriate boundaries, lack of an overall management system, and incompatible land-use in one nominated component.

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 could be justified for representation of a series of fossil sites, in view of the potentially discontinuous nature of related fossil outcrops. In practice the nominated series includes a suite of properties that range from those of a demonstrable international importance to those which, on their own are, at the most, of national interest. Whilst these properties may contain detailed aspects not seen in other Spanish ichnite localities, their inclusion establishes, in principle, an open-ended potential for further small, nationally important sites to be added to the series. IUCN does not consider that this is an appropriately justified serial approach.

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

The component parts are functionally linked in relation to the demonstration of the range of dinosaur ichnites present within the Iberian Peninsula. However they are arguably no more linked than other dinosaur footprint localities that can be found in other countries around the world.

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

As noted above, whilst the process of establishing an organisational framework to create an overall management framework for the property has been commenced, there is a large amount of work required before such a framework could be established.

5.2 Properties based on dinosaur ichnites

IUCN notes there has been a very long process of consideration of the possible recognition of dinosaur ichnite sites in relation to possible recognition on the World Heritage List, which includes two phases of consideration of the nominated property, and two other nominations related to dinosaur ichnites. These have mobilised considerable attention by States Parties, scientists, and IUCN and its networks. IUCN notes that these nomination processes may have resulted in progress in relation to the conservation of a number of ichnite sites, and support for development of scientific networks. However, they have not provided evidence that properties based on dinosaur ichnites alone provide a basis for the demonstration of Outstanding Universal Value. IUCN considers that the balance of evidence suggests that the World Heritage Convention is not the most appropriate route to pursue the recognition of a property, or of an international network of sites, focused solely on the study of dinosaur footprints and other traces. IUCN considers that alternative mechanisms to the World Heritage Convention should be considered for recognition of a single or serial property based on dinosaur ichnite values alone, considering the nature of these relatively widespread phenomena compared to the limited distribution of the most important fossil sites.

6. APPLICATION OF CRITERIA

Dinosaur Ichnites of the Iberian Peninsula, Portugal/Spain has been nominated under natural criterion viii.

Criterion viii: Earth's history and geological features

The nominated property contains a range of both internationally and nationally significant components that together represent the known record of dinosaur ichnites found within the Iberian Peninsula. The components selected are a more limited selection of a previous serial nomination in Spain, and include significant sites found on the territory of Portugal. However global comparative analysis has not demonstrated that the nominated series can be accepted to be of Outstanding

Universal Value, nor, more generally, that a single or serial property based on the values of dinosaur ichnites provides a basis for the demonstration of Outstanding Universal Value. The approach taken to comparative analysis in designing the serial nomination has significant flaws.

Based on its consideration of the nomination, IUCN concludes that the values of the property appear to be less significant than those of properties from the Age of the Dinosaurs that are already included on the World Heritage List and elsewhere, and also of other sites that include the remains of both ichnites and direct remains of dinosaurs. IUCN also notes that this group of fossil animals, and the periods when they lived on Earth are already relatively well represented on the World Heritage List.

In relation to integrity, IUCN notes that important values associated with the nominated components are referred to in the nomination document, but are not included in the property: the full complement of interrelated natural elements and the range of interests necessary for a complete demonstration and understanding of Outstanding Universal Value of the property are lacking. The property also does not meet the integrity, protection and management requirements set out in the Operational Guidelines. The selection of components within the serial property is not appropriate, including very small elements of national significance, and thus creating the potential for an open-ended series that is not appropriate for inclusion on the World Heritage List.

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-10/34.COM/8B** and **WHC-10/34.COM/INF 8B2**,
2. Decides not to inscribe the **Dinosaur Ichnites of the Iberian Peninsula, Portugal/Spain** on the World Heritage List;
3. Notes that, after the comprehensive assessment of three different nominations focused on dinosaur ichnite values, it has not been possible to establish Outstanding Universal Value for a nomination based on the basis of these values alone, and recommends that alternative mechanisms to the World Heritage Convention be considered for recognition of a single or serial property based on dinosaur ichnite values alone, considering the nature of these relatively widespread phenomena compared to the limited distribution of the most important fossil sites;

ANNEX: FOSSIL SITE CHECKLIST**(1) Does the property provide fossils which cover an extended period of geological time (i.e. how wide is the geological window)?**

Yes. The component parts of the nominated property span 100 million years of geological time, from the Middle Jurassic to the Upper Cretaceous. The nominated property includes fossils from the period of evolutionary history of dinosaurs including the diversification they underwent as from the Middle Jurassic until the time of their extinction at the end of the Cretaceous. It does not include fossils from the earliest period of evolution of the dinosaurs.

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

No. The record of new ichnotaxa of dinosaur tracks defined in the Iberian Peninsula stands at 18, belonging in different ichnogroups (Sauropoda, Theropoda and Ornithomimidae). Overall there are a diverse range of dinosaur families and trackway types represented in the nominated property, however its components have been selected on the basis of only dinosaur trace fossils, and thus does not contain whole biotic assemblages, being focused on just one group of animals.

(3) How unique is the 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 similar areas that are alternatives?

Whilst it is the locality for a number of type specimens of dinosaur ichnites, the nominated property is not unique in yielding fossil specimens from the Age of the Dinosaurs, nor in relation to displaying dinosaur ichnites. The eleven components include some of the largest known single sites demonstrating dinosaur footprints, which can be considered to be type localities demonstrating the richness of the dinosaur paleo-ichnological record of the Iberian Peninsula (which in total comprises about 230 sites and more than 22,000 footprints). A number of the components are relatively small and provide nationally important records that add to the values of the larger component parts.

(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 site nomination sufficient or should a serial nomination be considered?

There are comparable properties elsewhere. The nominated property notes the twenty most relevant trackway Geosites from the "Global Network of Dinosaur Tracksites" that could be compared to the IDPI. Of the foremost sites included two sites of the IDPI (one in Spain and one in Portugal), one in Bolivia (Cal Orck'o) that had been nominated and not inscribed on the World Heritage List, one in the Republic of Korea (Yeosu) that had been nominated and not inscribed on the World Heritage List, one in Australia (Lark Quarry) and one in the United States (Purgatoire). Notwithstanding a number of questionable aspects on the methodology adopted, the nomination identifies the three "best" sites as Cal Orck'o, El Peladillo (site within IDPI) and Lark Quarry in order of importance. The majority of the components of the property do not make a strong case to be considered as of global significance in their own right.

(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?

No, there are numerous of dinosaur sites worldwide where major scientific advances were and are being made. Furthermore there are numerous trackway sites that have been and are being researched. As noted within the nomination the proponent identifies two other trackway sites that are most important scientifically.

(6) What are the prospects for ongoing discoveries within the property?

The prospects vary between the components. Given the very small size and tight delineation of the boundaries of some components, there is little opportunity for ongoing discoveries. There may be some exception at the coastal sites where natural erosion processes may reveal new discoveries and also at the active quarry sites where anthropogenic activities may reveal new discoveries. The boundaries for the buffer zones of the individual sites also do not afford much opportunity for ongoing discoveries.

(7) How international is the level of interest in the property?

The nominated property, as a whole, is certainly rated by reviewers as an area of international importance in relation to the study of dinosaur footprints, but it is not the only such area, and not necessarily the primary area of importance. New findings in Bolivia, dating from near the end of the Age of Dinosaurs, include one trackway over 350m long. The Lark Quarry site in Australia includes

3000 prints and is considered to record a stampede of small dinosaurs some 95 million years ago. At Goseong, Republic of Korea, trackways belonging to Sauropods, ornithopods and theropods are recorded from mid-Cretaceous times. Sites across Colorado, Texas, New Mexico and Utah in the USA record many other types of dinosaur behaviour including herding. The values are relatively narrow in terms of the broader study of dinosaur evolution, Mesozoic environments and ecosystems. Some of the components of the property are very small and limited and their values are similar to many ichnite localities found elsewhere.

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

There are a varied range of landscapes and natural features in the areas surrounding the components of the property, but few other natural values within their tightly drawn boundaries. Many of the surroundings are recognised as protected areas, including Natural Park, Geopark or Cultural Park status. These include the Portuguese sites of Vale de Meios and Pedreira do Galinha, situated within "Natural Park of Serra de Aire e Candeeiros". The site of Pedra da Mua is situated within Natural Park of Arrábida. Las Cerradicas is situated within the Maestrazgo European and Global Geopark. - The sites of El Peladillo and Los Cayos (La Rioja) are situated in an area which has been declared a Biosphere Reserve.

(9) What is the state of preservation of specimens yielded from the property?

The ichnites found within the nominated property are generally well preserved and of good quality. There are effective ongoing site-based conservation measures in place in a number of the components, in order to monitor, record and protect the ichnite remains. However as a number of the components are small and finite, then there will be inevitable slow deterioration of their values, with little potential for renewal.

(10) Do the fossils yielded provide an understanding of the conservation status of contemporary taxa and/or communities? i.e. how relevant is the 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.

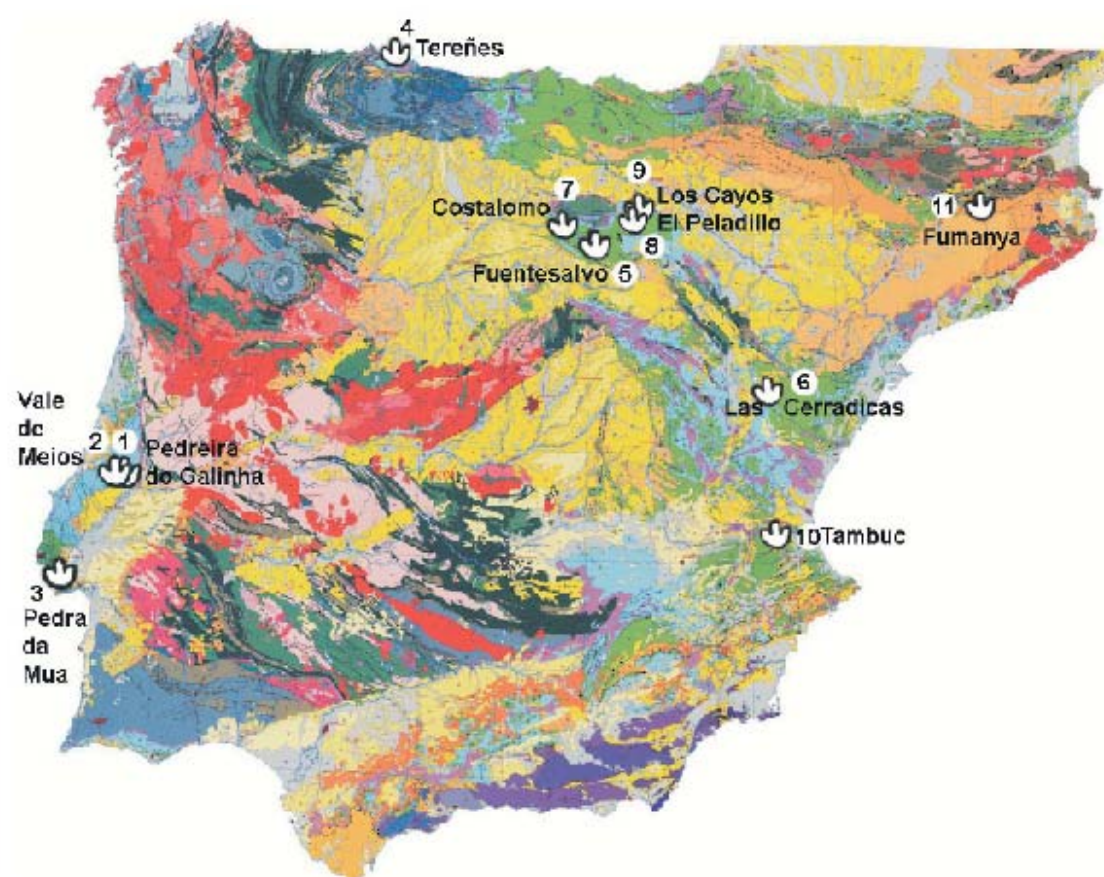
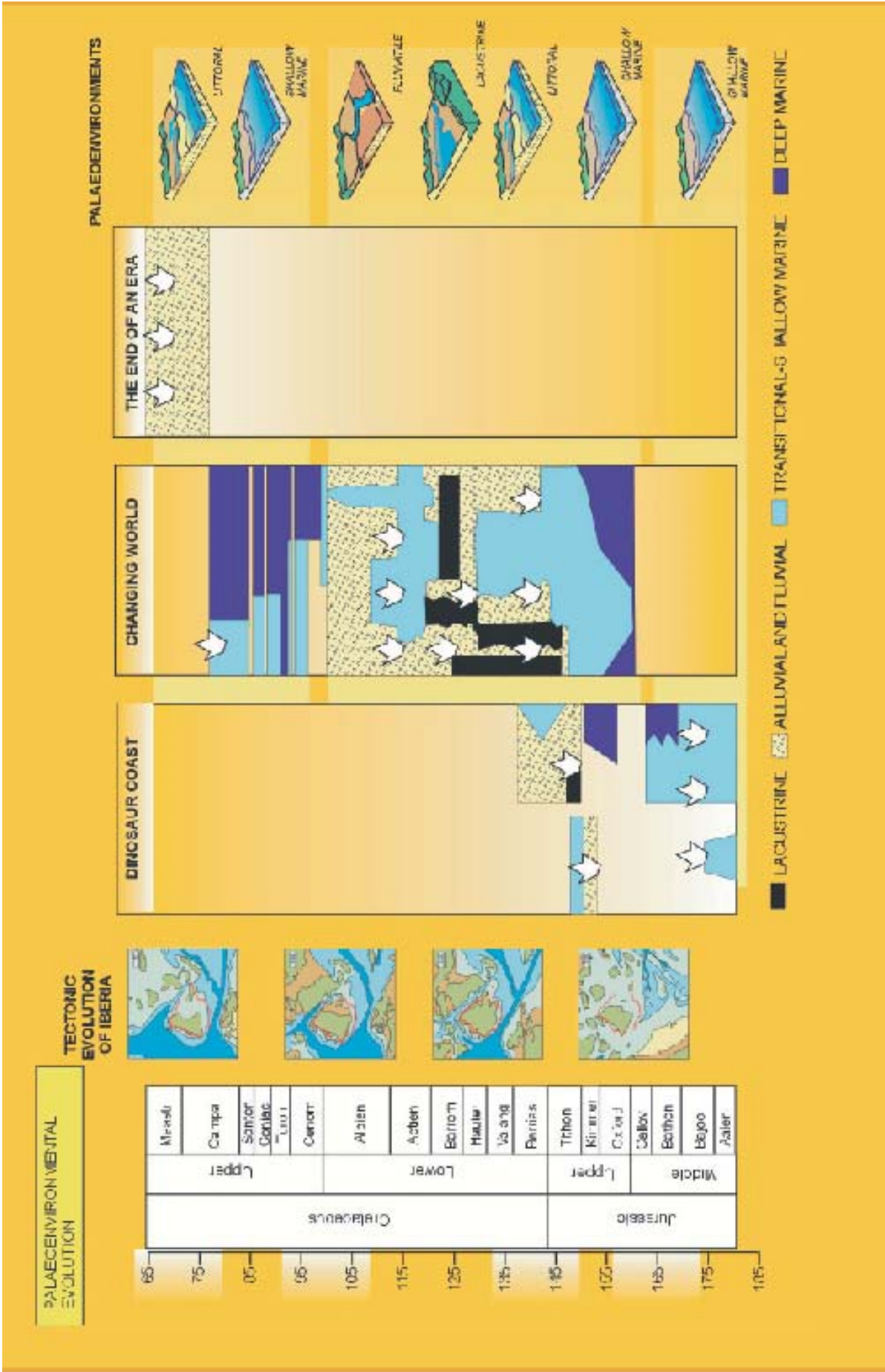
Map 1: Geological map of the Iberian Peninsula and location of properties proposed.

Figure 1: Paleogeographical, paleoenvironmental and sedimentary variations of Iberian geographical domains between the Middle Jurassic and the Upper Cretaceous.



EUROPE / NORTH AMERICA

THE PUTORANA PLATEAU

RUSSIAN FEDERATION



WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

THE PUTORANA PLATEAU (RUSSIAN FEDERATION) - ID N° 1234rev

Background note: An earlier nomination of the area had been deferred by the Committee in 2008. The corresponding Committee Decision recommended the State Party a) to refocus the nomination on the values and features within the Putorana State Nature Reserve in relation to criteria (vii) and (ix), supported by an enhanced global comparative analyses in relation to other World Heritage properties and protected areas within the Arctic; b) to provide a clear statement of support from the government that demonstrates its commitment to ensuring effective long term management, including the necessary human and financial resources, of the nominated property; and c) to develop and implement a management plan that specifies how the potential Outstanding Universal Value of the nominated property will be protected in the long term

1. DOCUMENTATION

- i) **Date nomination received by IUCN:** 16th March 2009.
- ii) **Additional information officially requested from and provided by the State Party:** Additional information was requested from the State Party following the IUCN World Heritage Panel, and was provided to the World Heritage Centre and IUCN in February 2010.
- iii) **UNEP-WCMC Data Sheet:** 7 references (including nomination).
- iv) **Additional literature consulted:** Chernov, Yu. I. (1985). **The Living Tundra**. Studies in Polar Research, Vol. I. Cambridge University Press, 213 pp.; Dingwall, P., Weighell, T. and Badman, T. (2005) **Geological World Heritage: A Global Framework Strategy**. IUCN, Gland, Switzerland.; Greenpeace Russia (2006) **Russian Natural Heritage**. Moscow, 175 p.; Klein, D. R. and Kuzyakin, V. 1982. **Distribution and status of wild reindeer in the Soviet Union**. Journal of Wildlife Management 46, 728-733.; Magin, C. and Chape, S. (2004) **Review of the World Heritage Network: Biogeography, Habitats and Biodiversity**. UNEP-WCMC and IUCN, Cambridge, UK.; Malyshev, L. 1993. **Levels of the upper forest boundary in Northern Asia**. Vegetatio, 109, 175–186. Rao, G. V. S. P., Venkateswarlu M., Rao, B. S., Prakash, R. (2003). **Mantle plumes, continental flood basalt volcanism and palaeomagnetism**. Indian Geophys Union 7, 135-44.; Romanov, A. A. (2003) **Avifauna of Lake Hollows in the Western Putorana Plateau**. Moscow, 143 p.; Romanov, A. A. (2006) **Bird and Animal Communities of the Putorana Plateau: Studies and Conservation**. Moscow, 275 p.; Romanov, A. A. (2006) **Plateau Putorana: “Pearl” of the Russian Arctic**. Moscow, 40 p.; Shahgedanova, M. (2002). **The Physical Geography of Northern Eurasia**. Oxford University Press, New York.; Soja A.J., Tchebakova, N. M. French, N. F. et al. 2007. **Climate-induced boreal forest change: Predictions versus current observations**. Global and Planetary Change, 56, 274-296.; Thorsell, J. and Hamilton, L. (2002) **A Global Overview of Mountain Protected Areas on the World Heritage List**. IUCN, Gland, Switzerland.; Thorsell, J. and Sigaty, T. (1997) **A Global Overview of Forest Protected Areas on the World Heritage List**. IUCN, Gland, Switzerland.; Usol'tsev, V. A. and Koltunova, A. I. (2001). **Estimating the carbon pool in the phytomass of larch forests in Northern Eurasia**. Russian Journal of Ecology 32:235-242.
- v) **Consultations:** Nine external reviewers in addition to reviews of the earlier nomination. Extensive consultations were undertaken during the field visit with representatives of the Ministry of Natural Resources of the Russian Federation; the head and staff of the Putoransky Zapovednik; representatives of national NGOs, the Institute for Agriculture of the Far North in Norilsk and the mining company Norilsk Nickel.
- vi) **Field visit:** Viliam Pichler, September 2009.
- vii) **Date of IUCN approval of this report:** 22nd April 2010.

2. SUMMARY OF NATURAL VALUES

The nominated property, which coincides with the area of the the Putoransky State Nature Reserve, is located in the central part of the Putorana Plateau in northern Central Siberia. It is situated some hundred kilometres north of the Polar Circle and almost 200 kilometres south-east of Norilsk, the next town. It comprises an area of 1,887,251 ha and has been a State Nature Reserve (Zapovednik) since 1987. Its altitude ranges between 400-1600 m.a.s.l. The area has been exposed to an arctic climate for millennia due to the high latitude. Permafrost covers the major part of the plateau, but there are no major glaciers.

The Putorana Plateau originates from a Permian-Triassic mantle plume, which is an immense upwelling of magma, resulting in extended tectonic movements and extensive volcanism. This created a basalt and tuff plateau in which rivers and streams carved valleys and canyons over millions of years. The typical character of the Putorana Plateau is the stepped line of its slopes, distinguished by alternation of hard weathering basalt, diabase, dolerite with more easily eroded tuff and sandstone tuff.

The arctic climate of the Putorana Plateau is strongly continental: the average July temperature being 14.2°C, the average January temperature being -27.5°C, with an average annual air temperature of -9.7°C. The Putorana Plateau is one of the most significant watersheds of northern Eurasia due to relatively high precipitation. Erosion and sedimentation, together with tectonic uplift of the plateau, have created spectacular landforms in the permafrost environment. Numerous rivers and streams originate in the area, and there is a complex network of lakes. Today, "fjord-like" lakes, up to 150 km long and 420 m deep, surround the central parts of the plateau. In total, there are more than 100 lakes with a surface area larger than 100 ha and more than 18,000 lakes with a smaller surface area. The plateau's regular alternation of softer and harder rocks has also resulted in a large number of waterfalls up to 108 m high.

The vegetation ranges from sparse arctic lichen formations to various types of northern coniferous taiga forests. These vegetation types occur in diverse and dynamic patterns and often vary over a very small distance. 398 species of vascular plants are reported in the nominated property, including rare and endemic species such as *Trollius asiaticus*, *Rhodiola rosea*, *Papaver variegatum* and *Juncus longirostris*. Forests and woodland vegetation comprise birch, Common Aspen, Siberian Spruce, Siberian Larch and Dahurian Larch. Two plant species (*Caltha serotina* and *Euphrasia putoranica*) are endemic to the area. Five plant species (*Draba sambuckii*, *Festuca auriculata* var. *pilosa*, *Juncus*

longirostris, *Oxytropis putoranica* and *Papaver variegatum*) have their centre of distribution within the nominated property but also occur in small populations in other parts of Northern Siberia.

A complete spectrum of arctic wildlife occurs with brown bear (more than 760 individuals), wolf (840 individuals in 2001), Arctic Fox, lynx, glutton, otter (at some locations), sable, elk, reindeer, Russian flying squirrel (at one location) and blue hare. Except for reindeer and Arctic Fox, all species are permanent inhabitants of the plateau. One of the major reindeer migration routes in Eurasia crosses the nominated property. Twice a year between 150,000 and 250,000 wild reindeers from Taymir Peninsula migrate along the valleys of the plateau to their winter habitats in the south. This is one of the last migration routes in Central Siberia not blocked or fragmented by pipelines. The nominated property is also an important stop-over point for migrating arctic birds. In total, 34 mammal species, 140 bird species and 25 fish species have been recorded in the nominated property. At least four fish species are endemic to the area (*Salvelinus boganidae*, *Salvelinus drjagini*, *Salvelinus taimyricus* and *Salvelinus tolmachoffi*).

The nominated property protects a significant part of the population of the endemic Putorana snow sheep (*Ovis nivicola borealis*), one of the four subspecies of the Siberian snow sheep, which live totally isolated from each other in different parts of Siberia. By the early 1960s, the Putorana snow sheep remained only in the most remote parts of the plateau, due to hunting and poaching. Following the establishment of the State Nature Reserve, the population recovered to about 1,400 individuals, now occurring throughout the nominated property.

3. COMPARISONS WITH OTHER AREAS

The Putorana Plateau has been nominated under natural criteria (vii) and (ix).

In relation to criterion (vii), the natural beauty of the plateau's landscapes is spectacular and comparable to existing World Heritage properties. This derives from the untouched arctic and boreal landscape elements which are enhanced by an enormous variation in the relief of the area, fjord-like lakes, hundreds of waterfalls and dozens of canyons more than 500 m deep. These canyons are comparable to canyons such as those in the Grand Canyon National Park (USA) and the Tara River Gorge in the Durmitor National Park (Montenegro). Kanda waterfall (108 m), the highest waterfall within the nominated property, is one of the ten highest waterfalls in Russia. However, there are a number of World Heritage properties with higher or more impressive waterfalls, including Iguazu/Iguaçu (Argentina/Brazil), Mosi-oa-Tunya/Victoria

Falls (Zambia/Zimbabwe) and Yosemite (USA). However, a key aesthetic feature of the nominated property is the high concentration of waterfalls. In this regard, the plateau can be favourably compared to World Heritage properties known for their numerous waterfalls, such as Plitvice Lakes (Croatia), Te Wahipounamu – South West New Zealand, Gondwana Rainforests of Australia, Noel Kempff Mercado (Bolivia), Atlantic Forest South-East Reserves (Brazil) and Canaima (Venezuela). However, these waterfalls are either concentrated within one catchment, such as in the Plitvice lakes, or in properties featuring prevailing exposure to humid air masses. The Putorana Plateau is the only area with such a high density of waterfalls in a predominantly continental arctic climate.

When compared to other Arctic and near-Arctic World Heritage properties or sites on Tentative Lists (Nahanni National Park, Wood Buffalo National Park, both Canada, Ilulissat Icefjord, Denmark, Surtsey Island, Iceland, Wrangel Island, Komi Forests, Commander Islands, Magadan Nature Reserve, all Russian Federation, Svalbard Archipelago, Islands of Jan Mayen and Bouvet, both Norway, Laponian Area, Sweden) the striking feature of the Putorana Plateau is the mosaic of an extremely diverse range of habitats. While most habitat types are covered in existing World Heritage properties and exist elsewhere, only Putorana harbours a complete set of largely pristine subarctic and arctic ecosystems in an isolated mountain range. While not globally unique the wild reindeer migration across the property represents an exceptional, large-scale and increasingly rare natural phenomenon.

In relation to criterion (ix) it is important to note that ecological and biological processes occur naturally in the nominated property without any human intervention. The property features a wide and distinct spectrum of ecological and biological processes because of the specific combination of geological and climatic conditions. Distinct soils and microclimates occur on the plateau-like mountains and on the slopes of the valleys and canyons formed in this permafrost environment. These are complemented by a wide spectrum of water-shaped habitats, ranging from arctic stone desert to temperate mountain wetlands; thus resulting in a remarkably diverse and dynamic pattern of vegetation types. The presence of endemic plant species is also associated with the variety of extreme environmental conditions.

The nominated property features a typical set of boreal and arctic ecosystems and species. Similar ecosystems and species can be found in World Heritage properties of the same climate zones in the northern hemisphere, such as Kluane/Wrangell-St Elias/Glacier Bay/Tatshenshini-Alsek (Canada/USA), Nahanni and Wood Buffalo (Canada), Virgin Komi Forests and Wrangel Island (Russian

Federation), and the Laponian Area (Sweden). This is due to the fact that these areas were at least temporarily linked by land bridges during the Ice Age. However, the Putorana Plateau harbours a complete set of such ecosystems in an isolated arctic mountain range: untouched taiga, tundra and arctic desert systems as well as pristine cold-water lake and river systems.

Although the level of endemism in the nominated property is lower than in temperate or tropical regions of the world, it still ranks significantly when compared to other areas with arctic climate conditions. Thus, the nominated property could address some of the gaps identified in relation to arctic ecosystems in the 2004 Review of the World Heritage Network prepared by UNEP-WCMC and IUCN, mainly the underrepresented subarctic tundra biome.

The revised nomination under consideration contains a considerably enhanced comparative analysis and a stronger and clearer governmental commitment to the future management of the property.

4. INTEGRITY

4.1 Legal status

The nominated property was declared a State Nature Reserve (Zapovednik; equivalent to IUCN Protected Area Management Category Ia) under the jurisdiction of the federal government in 1987. No land uses are allowed other than scientific research and monitoring. A number of other federal and regional laws and regulations on nature conservation, land use planning, scientific research and monitoring, and environmental education apply to the nominated 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 property coincide with those of the Putoransky State Nature Reserve. The property of 1,887,251 ha is surrounded by an extensive buffer zone of 1,773,300 ha, established in 1987 by a decision of the Krasnoyarsky Krai regional government and further extended in 1993 by a decree of the Taimyr Autonomous District. The management of the buffer zone is under the jurisdiction of the State Nature Reserve, but different land ownership and land use arrangements present a challenge to the effective management of the buffer zone. Some important natural features, such as lakes and waterfalls, mentioned in the nomination document are located within the buffer zone. Only one of the ten largest lakes in the area,

Lake Ayan, lies completely within the nominated property. However, IUCN considers that the nominated property includes the key areas that are essential for maintaining the property's natural beauty. The property is also of sufficient size and contains the necessary elements to demonstrate the key aspects of ecological and biological processes that are essential for the long term conservation of the property's ecosystems and biological diversity.

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

4.3 Management

The nominated property is only readily accessible by helicopter from an airport near to Norilsk, located about 200 km north-west from its western border, or by boat along the lakes, but navigation on the only water course (Norilka River) leading to the Lama Lake is difficult. There is a check-point, where all boats must stop and register. Access to the property is limited and requires a special permit from the reserve administration and its scientific board. This limited access facilitates the protection and patrolling of the nominated property. There are no roads within the nominated property and large parts of the buffer zone. Access to Norilsk, a major mining complex, is restricted for foreign visitors. Visitors of the Putorana Reserve must be in possession of valid entry documents issued by the municipal authority upon invitation and approval from the director of the Putorana Reserve.

The management of the reserve is carried out according to the Regulations of the Putoransky State Nature Reserve adopted by the Federal Ministry of Nature Resources in March 2005. These rather general regulations are revised every five years and implemented through annual work plans. The nomination also refers to a draft management plan, presented as an annex to the nomination, which IUCN understands was approved in Spring 2009, shortly after the submission of the nomination. IUCN notes that the management plan does not expressly mention Outstanding Universal Value, however considers that it provides an adequate framework for the management of the property.

At the time of field evaluation the staff working in the nominated property comprised 33 persons, including 6 scientists and 12 rangers. More than half of the staff conduct ranger tasks such as fishing and hunting inspections and forestry supervision. IUCN considers that the existing number of staff is insufficient to effectively patrol the vast property, particularly in light of increasing tourism in the buffer zone, which could lead to unauthorized access to the nominated property. However, the additional information provided by the State Party notes that the number of staff will be increased by 50% in

case of the inscription of the property in the World Heritage List.

The federal funding allocated to the conservation and management of the nominated property in 2008 was 9,101,800 Russian Rouble (RUB, around US\$ 313,000) comprised mostly of the federal budget and slightly less than one million RUB from donations. The bulk of the budget is spent on salaries with only a reported 12% dedicated to management and conservation. The management plan suggests annual budget increases in the future. A minor increase was reported to the field evaluator to adjust for inflation. The 2009 budget of the Putoransky State Nature Reserve has been increased by 500,000 RUB in addition to the inflation adjustment. Additional funds are expected to be made available for the monitoring of the Putorana snow sheep population. Overall, this will improve opportunities for effective management and conservation, in particular through flight patrols.

Despite severely limited funds and staffing levels, the reserve's administration has managed to create a broad public awareness of the Putoransky State Nature Reserve and it has also succeeded in establishing a high level of awareness of and support for its protection among local decision-makers, opinion leaders and citizens. The donations from individuals and organizations support this observation by the field evaluator.

IUCN considers the management meets the requirements set out in the Operational Guidelines.

4.4 Threats and human use

There are no roads, settlements or human activities, other than scientific research and monitoring, within the nominated property.

Uncontrolled hunting in the 1960s to 1980s resulted in a sharp decline in some of the key species of the property, such as the endemic Putorana snow sheep. Today, hunting is totally prohibited within the nominated property. Fishing is allowed for visitors to the area, but they are urged to catch and release fish. There is no evidence how far this is respected, but even if the catch was used for personal supply this would be of minimal impact. Access to the reserve is only possible by special permission of the reserve administration and its scientific board only. About six small ensembles of wooden huts, all without any additional infrastructure such as electric power or water supply, accommodate visitors in the buffer zone. In 2005, 437 people visited the reserve, including 30 tourist groups, 170 individuals and 3 scientific researchers. The impact of visitors on the natural values and integrity of the reserve is minimal. The entry regulations and permit system seem to be appropriate to control visitation.

Indigenous peoples used the area in the past for reindeer herding or hunting. The only permanent settlement located on the Putorana Plateau, but outside the borders of the nominated property, is the Khantaisky village with about 500 inhabitants, 400 of which are indigenous people from the Dolgan and Evenk communities. Their traditional occupation is reindeer herding, hunting and fishing.

Beside boats, helicopters provide the only feasible access to the area, resulting in some visual and acoustic impacts, including on wildlife. As these impacts increase with the number of flights, flights should be restricted to a minimum. At the same time, air traffic is limited by the often adverse weather conditions.

Tourism in the buffer zone, especially in its western part, is growing rapidly. There are no exact numbers on visitation but it is estimated that several thousand tourists visit the buffer zone per year. Tourism is a promising economic activity for the area, and tourism development has resulted in the construction of a number of buildings. However, these buildings are neither integrated properly into the natural landscape nor follow traditional architectural principles and practices. The additional information provided by the State Party notes that due to the vast area of the buffer zone it is impossible to fully control the development of new buildings. There are concerns about the growing pressure for tourism development, as it could lead to unauthorised access to the nominated property by land and water routes. Tourism development and associated infrastructure development is also of concern for another important reason. One of the most important inter-regional reindeer migration routes crosses the nominated property. This route has gained importance over time due to the fact that other important routes are now blocked by traversing oil and gas pipelines. Even though the most likely areas for further tourism development, such as the surroundings of Lake Lama and, to a lesser extent, Lake Keta, do not coincide with reindeer migration routes, possible conflicts between tourism and reindeer migration need to be considered. As the continuation of this natural phenomenon depends strongly on the natural conditions of the areas within and outside the nominated property, effective legal and management systems are required to ensure that further tourism development does not adversely affect the necessary natural conditions. These systems include hunting regulations and monitoring of the reindeer population.

Mining is also a potential threat to the integrity of the nominated property. The Norilsk mining and smelting complex, located about 200 km north-west from its western border, was developed to exploit the important mineral resources of the region. Today, the mining and smelting company Norilsk Nickel is the world's leading producer of nickel.

Vast areas east and south-east of Norilsk suffer from forest dieback caused by acid emissions from the metallurgical process. According to current data, the closest areas affected by air pollution are more than 100 km away from the nominated property, but air pollution is already affecting the western part of the buffer zone. Reportedly, Norilsk Nickel intends to reduce sulfur emissions by approximately two-thirds, but the technology is still under development.

Based on geological information, mining could potentially be extended to areas close to the nominated property, but Norilsk Nickel confirmed in discussions during both IUCN field mission that there are no plans to mine within the nominated property. The Federal Law on Specially Protected Natural Areas does not allow prospecting or mining within the nominated property.

Despite shortcomings and future threats the approved management plan for the nominated property and the increased financial resources for the protection and management of the nominated property constitute considerable improvements since the original nomination of the property.

In summary, IUCN considers the nominated property meets the conditions of integrity as outlined in the Operational Guidelines.

5. ADDITIONAL COMMENTS

5.1 Comments of ICOMOS

ICOMOS provided comments on the cultural values of the property to IUCN, centering on the use of the traditional use of the Putorana Plateau by indigenous peoples, the Dolgan and Evenk. ICOMOS considers that the cultural significance of the landscape associated with a reindeer based economy of the Dolgan and Evenk needs to be recognised and sustained as these peoples have exceptionally long associations with this part of Siberia in comparison with the very recent 'creation' of this plateau as a natural Reserve in 1987. ICOMOS is concerned that this nomination appears to condone the removal of reindeer hunters from this area and the suppression of the very longstanding traditional activities of reindeer herding and hunting. ICOMOS also questions whether the nominated property could not be managed in conjunction with traditional practices.

IUCN concurs that the recognition of sustainable traditional herding and resource use is an important factor that the State Party should support through programmes in the buffer zone of the property, and consultation with the indigenous communities in the further development of the management system for the area. IUCN considers that, in principle,

low-intensity traditional uses within the nominated property would not necessarily threaten its natural values, provided possible impacts were carefully considered in the management of the property.

6. APPLICATION OF CRITERIA

The property has been nominated under natural criteria (vii) and (ix).

Criterion (vii): Superlative natural phenomena or natural beauty

A vast and diverse landscape of striking natural beauty, the Putorana Plateau is pristine and not affected by human infrastructure. Its superlative natural features include an extensive area of layered basalt traps that has been dissected by dozens of deep canyons; countless cold water rivers and creeks with thousands of waterfalls; more than 25,000 lakes characterized by a fjord-like formation that is associated with a large variation in the relief. The immense arctic and boreal landscapes remain intact with carpets of lichens and forest that are unusual at such northern latitudes.

An enhanced global comparative analysis has demonstrated the nominated property's Outstanding Universal Value under this criterion.

IUCN considers that the nominated property meets this criterion.

Criterion (ix): Ecological and biological processes

The property displays a comprehensive set of ecological and biological processes associated with its diverse arctic and subarctic ecosystems. Its bio-geographical location, on the border of the tundra and taiga biomes and at the transition between Western and Eastern Siberian floras, makes the property one of only a few centres of plant species richness in the Arctic. The combination of landscape diversity, remoteness, naturalness and degree of protection are extraordinary. In addition, the property may provide valuable evidence on the impacts of climate change to large-scale natural arctic ecosystems if proper monitoring and research take place.

IUCN considers that the nominated property meets this criterion.

7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents **WHC-10/34.COM/8B** and **WHC-10/34.COM/INF 8B2**,
2. Inscribes the **Putorana Plateau, Russian Federation**, to the World Heritage List under natural criteria **(vii)** and **(ix)**;
3. Adopts the following Statement of **Outstanding Universal Value**:

Brief synthesis

Comprising a vast area of 1,887,251 ha, the property is located in the centre of the Putorana Plateau in the northern part of Central Siberia. The part of the plateau inscribed on the World Heritage list harbours a complete set of subarctic and arctic ecosystems in an isolated mountain range, including pristine taiga, forest tundra, tundra and arctic desert systems, as well as untouched cold-water lake and river systems. The combination of remoteness, naturalness and strict protection ensure that ecological and biological processes continue at a large scale with minimal human influence. The property provides a dramatic demonstration of ecological processes, including the interactions between healthy populations of a full range of Arctic fauna. A major reindeer migration crosses part of the property. The property is also one of the very few centres of plant species richness in the Arctic.

Criteria

Criterion (vii): *A vast and diverse landscape of striking natural beauty, the Putorana Plateau is pristine and not affected by human infrastructure. Its superlative natural features include an extensive area of layered basalt traps that has been dissected by dozens of deep canyons; countless cold water rivers and creeks with thousands of waterfalls; more than 25,000 lakes characterized by a fjord-like formation that is associated with a large variation in the relief. The immense arctic and boreal landscapes remain intact with carpets of lichens and forest that are unusual at such northern latitudes.*

Criterion (ix): *The property displays a comprehensive set of ecological and biological processes associated with its diverse arctic and subarctic ecosystems. Its bio-geographical location, on the border of the tundra and taiga biomes and at the*

transition between Western and Eastern Siberian floras, makes the property one of only a few centres of plant species richness in the Arctic. The combination of landscape diversity, remoteness, naturalness and degree of protection are extraordinary. In addition, the property may provide valuable evidence on the impacts of climate change to large-scale natural arctic ecosystems if proper monitoring and research take place.

Integrity

The property is a strictly protected State Nature Reserve, or "Zapovednik": its boundaries coincide with those of the Putoransky State Nature Reserve. The property is large and is surrounded by an extensive buffer zone of 1,773,300 ha. The property's size, remoteness and naturalness, as well as the degree of protection afforded to it are essential attributes in ensuring the protection of the full range of largely undisturbed landscapes and processes that are the basis of its Outstanding Universal Value. The property includes the key areas and features that are essential for maintaining the property's natural beauty. A full range of important natural features, such as lakes, canyons and waterfalls, is located within its boundaries. The property is also of sufficient size and contains the necessary elements to maintain the ecological and biological processes that are essential for the long term conservation of the property's ecosystems and biological diversity, and the migratory species that rely on its natural state.

Difficult access is also a contributor to the property's integrity: there are no roads within the property and large parts of the buffer zone, thus the property is only accessible by helicopter or boat. The property is also unaffected by the impacts of mining and other land-uses incompatible with its values. Important natural values linked to the property are located in the buffer zone, and their conservation is also an essential requirement.

Management and protection requirements

The property was declared a strictly protected State Nature Reserve (Zapovednik) in 1987. No land or resource uses are allowed other than scientific research and monitoring. A number of other federal and regional laws and regulations on nature conservation, land use planning, scientific research and monitoring, and environmental education apply to the property.

The combination of a strict legal and management framework, remote location and lack of any road infrastructure enables effective management of the property with relatively modest staffing and funding levels for a protected area of this magnitude. Increasing tourism in the buffer zone carries the risk of unauthorized access to the property, including for hunting and fishing. There is a need for unambiguous and rigorously enforced land use and building arrangements in the buffer zone and for regulations of tourism, including strict limits on air traffic.

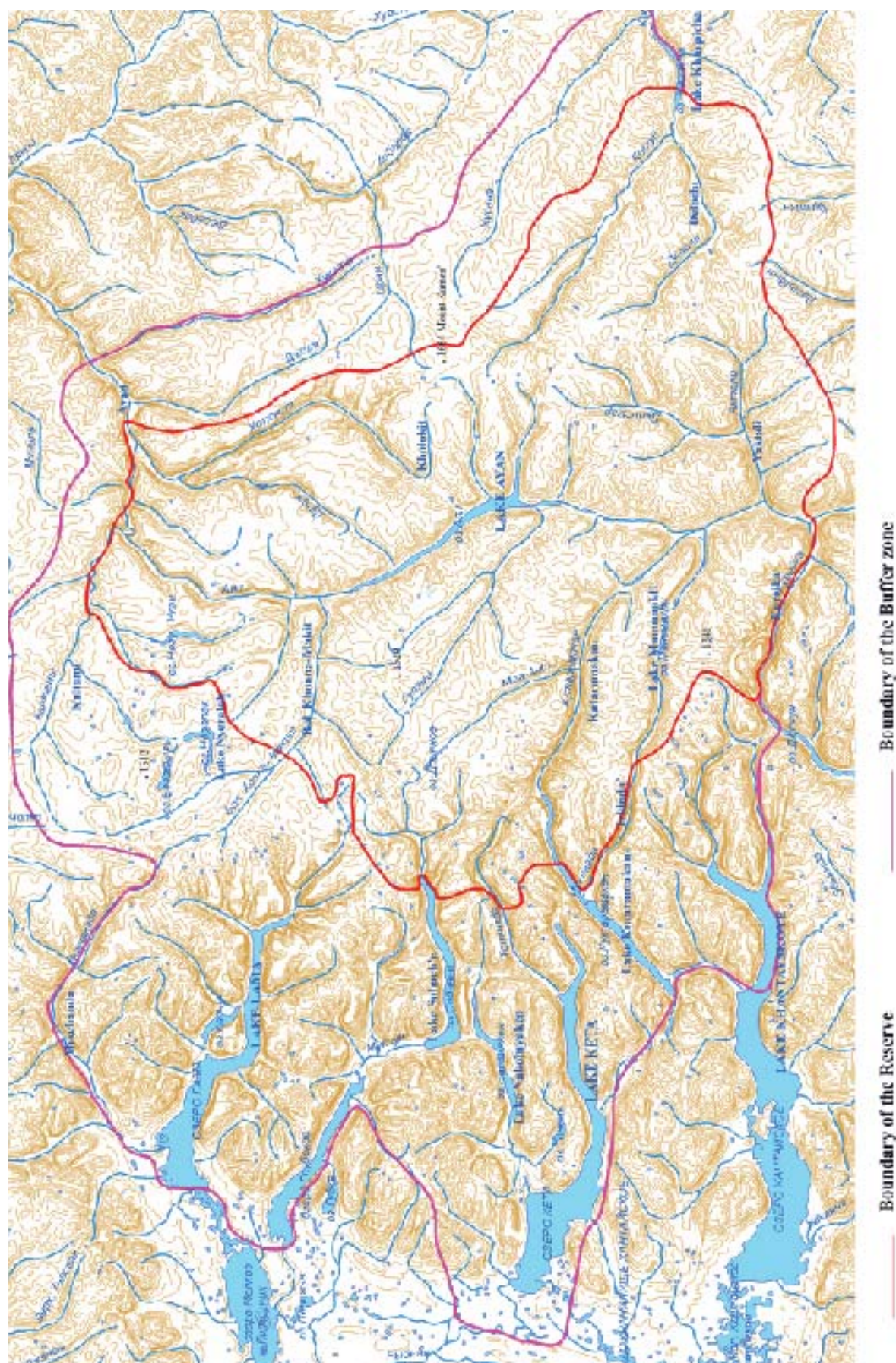
Mining is a potential threat to the property. The Federal Law on Specially Protected Natural Areas prohibits mining in the property. It must be ensured that the impacts of existing and future mining outside the property will not affect in any way the Outstanding Universal Value and/or integrity of the property, for example through air pollution, pipelines or the development of any supporting infrastructure.

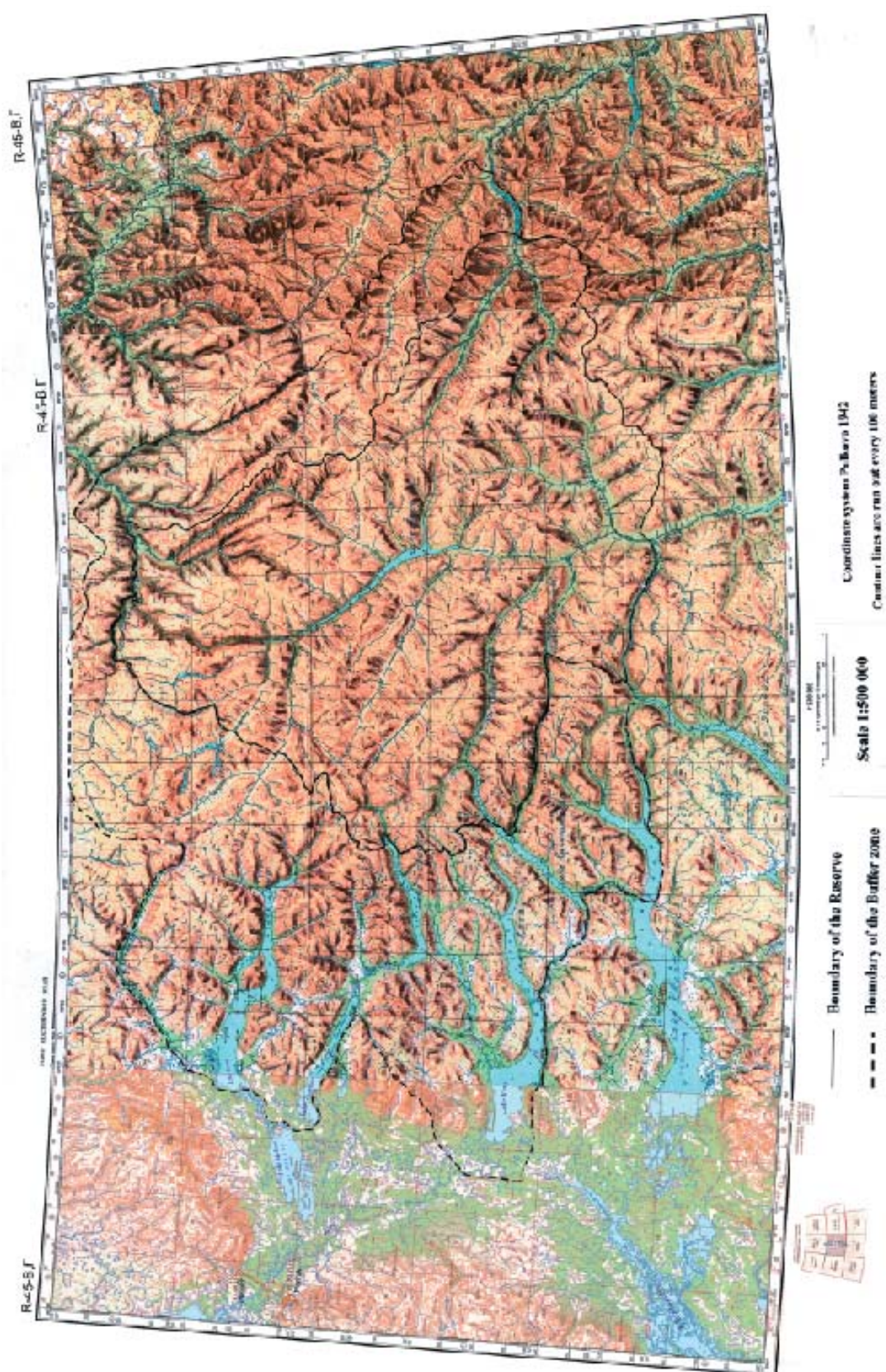
One of the most important inter-regional reindeer migration routes crosses the property. As the continuation of this natural phenomenon depends strongly on the natural conditions of the areas within and outside the property, effective legal and management systems are required to ensure that human use, including tourism, mining and other development will not adversely affect this phenomenon.

4. Commends the State Party on the elaboration and approval of a management plan for the property and requests the State Party to sustain its commitment to the protection, management and monitoring of the property through sufficient financial resources and staffing levels to ensure the effective long-term implementation of the management plan;
5. Requests the State Party to further develop and implement more detailed management schemes for sustainable recreational use and environmentally friendly tourism within the buffer zone of the property, in cooperation with local authorities and stakeholders, including indigenous communities, and taking account of the needs for tourism monitoring, zoning and regulatory frameworks and licensing schemes for buildings, infrastructure, and tourism operations;

6. Encourages the State Party to clearly demarcate the boundaries of the property at all entry points and to strictly regulate air access to the property;
7. Commends the State Party on the diverse range of funding sources for the property, and requests the State Party to ensure funding for management, and encourages the State Party to increase their investments in research;
8. Recommends setting up a long-term scientific research and monitoring program to document and better understand the impacts of climate change on the diverse array of ecosystems within the property;
9. Notes that the important migration of reindeer which crosses the property is vulnerable to impacts from activities outside the property, such as tourism, mining and pipeline construction and urges the State Party to ensure such threats to this important value of the property are effectively controlled;
10. Requests the State Party to ensure that mining and mineral exploitation inside the property remain permanently prohibited and to also prevent any indirect impacts from mining outside the boundaries that could affect the values of the property.

Map 1: Boundaries of the nominated property and its buffer zone



Map 2: Topographic map of the nominated property and its buffer zone

4.2. Topographic map of the Putorana plateau, showing exact boundaries of the Putoransky Reserve and its Buffer zone. Scale 1:500 000

A. Natural Properties

A3 Extensions of Natural Properties

EUROPE / NORTH AMERICA

PIRIN NATIONAL PARK

BULGARIA



WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

PIRIN NATIONAL PARK (BULGARIA) - ID N° 225 bis rev

Background note: Pirin National Park, was inscribed on the World Heritage List in 1983 under criteria (vii), (viii) and (ix), at that time numbered natural criteria (i), (ii) and (iii). The original IUCN evaluation noted the mountain scenery, glacial geomorphology, and the continuing evolution of the flora, as evidenced by a number of endemic and relict species, as key features of the Outstanding Universal Value of the property. The proposed extension of Pirin National Park has been nominated under criteria (vii), (ix) and (x).

In line with previous recommendations by the World Heritage Committee and IUCN, the State Party submitted both a proposal for the extension of the existing property in 2006, in which it also proposed to exclude the Bansko and Dobrinishte tourism zones from the property and to include them in a new buffer zone. This proposal was incomplete and therefore not evaluated by IUCN. A revised proposal submitted in 2007 was evaluated by IUCN but withdrawn by the State Party before its examination by the World Heritage Committee at its 32nd session of the (Quebec City, Canada, 2008). A further revised proposal, in which the State Party again proposes to exclude the Bansko and Dobrinishte tourism zones from the property and to include them in a new buffer zone, was submitted in 2009 and is the subject of this evaluation.

Since 2002, the property has been the subject of repeated concern by the World Heritage Committee regarding threats to the Outstanding Universal Value of the property from the development of ski facilities in the Bansko and Dobrinishte tourism zones (see Decisions 26COM 21B.2, 27COM 7B.15, 28COM 15B.21, 29COM 7B.23, 31COM 7B.27 and 33COM 7B.21). Two joint World Heritage Centre / IUCN monitoring missions were carried out in 2002 and 2004, one IUCN evaluation mission in 2007, and the Committee noted in 2002 and 2009 the possible inclusion of the property in the List of World Heritage in Danger.

1. DOCUMENTATION

- i) **Date nomination received by IUCN:** 16th March 2009
- 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) **UNEP-WCMC Data Sheet:** Last updated in August 2007, sourced from original nomination document and nomination for extension, as well as additional references. To be updated in line with Committee decision.
- iv) **Additional literature consulted:** Burmester, A. et al. (2005) **World Natural Heritage and Cultural Landscapes in Europe**. Report of the Workshop at the International Academy for Nature Conservation, Isle of Vilm, Germany, 18-21 June 2005. German Federal Agency for Nature Conservation, Bonn.; Grunewald, K., Monget, J.-M. and Brown, D. (2009) **Characterisation of contemporary local climate change in the mountains of southwest Bulgaria**. Climatic Change 95: 535-549.; IUCN (2008) **IUCN Technical Evaluation of the Proposed Extension of Pirin National Park**. IUCN, Gland, Switzerland.; Milne, R. and Heiss, G. (2002) **Report of the International Mission to Pirin National Park, Bulgaria**, 11-16 February 2002. UNESCO, Paris.; Ministry of the Environment and Water (2004) **Pirin National Park Management Plan 2004-2013**. Ministry of the Environment and Water, Sofia.; Rössler, M. and Zupancic-Vicar, M. (2004) **Report on the UNESCO-IUCN Mission to Bulgaria**, 3-6 February 2004. UNESCO, Paris.; Save Pirin NGO Coalition (2006) **Bansko Ski Zone – Crime against: UNESCO Site, Potential Natura 2000 Site**. Save Pirin NGO Coalition, Sofia.; Strid, A. (1980) **Flora of Mount Olympus**. Goulandris Museum of Natural History, Athens. Thorsell, J. and Hamilton, L. (2002) **A Global Overview of Mountain Protected Areas on the World Heritage List**. IUCN, Gland, Switzerland.; Thorsell, J. and Sigaty, T. (1997) **A Global Overview of Forest Protected Areas on the World Heritage List**. IUCN, Gland, Switzerland.; WWF Danube-Carpathian Programme (2008) **White Elephants in the Green Mountains: Ski Developments in Bulgaria**. WWF Danube-Carpathian Programme, Vienna, Austria.

- v) **Consultations:** Eleven external reviewers. Extensive consultations were undertaken during the field visit with the Deputy Minister of Environment and Water; representatives of the National Nature Protection Service Directorate in the Ministry of Environment and Water; the Director and other staff of Pirin National Park; scientists, representatives of private sector, community and NGO interests, and the Bulgarian National Commission for UNESCO.
- vi) **Field visit:** Marija Zupancic-Vicar and Bastian Bomhard, October 2009.
- vii) **Date of IUCN approval of this report:** 22nd April 2010.

2. SUMMARY OF NATURAL VALUES

The existing World Heritage property covers an area of 27,442.9 ha in the Pirin Mountains, southwest Bulgaria, and includes mostly the lower altitude, forested parts of the 40,356 ha Pirin National Park. It comprises diverse limestone mountain landscapes with some 70 glacial lakes and other glacial landforms, waterfalls, caves and predominantly coniferous forests, including significant stands of Bosnian pine (*Pinus heldreichii*) and Macedonian pine (*P. peuce*), two Balkan endemics. The property includes a range of endemic and relict species representative of the Balkan Pleistocene flora.

The dominant part of the proposed extension is high mountain territory over 2,000 m altitude, covered mostly by alpine meadows, rocky screes and summits. The flora of Pirin National Park includes 1,315 species of vascular plants, about one third of Bulgaria's flora, including 86 Balkan endemics, 17 Bulgarian endemics and 18 local endemics, found mainly on the rock and meadow communities of the sup-alpine and alpine zone in the proposed extension. The flora of lichen (367 species) and mosses (329 species) represents about half of the total lichen and moss flora in Bulgaria. The flora also includes 165 species of algae and 375 species of fungi. The fauna of Pirin National Park includes 45 mammal species and 159 bird species. Pirin is also home to eight species of amphibians, eleven species of reptiles and six fish species. The inventory of invertebrates is far from being completed: 3,400 species have been recorded up to now. There are no figures available for the species values of the proposed extension relative to the existing property; however, due to the altitudinal difference between the two, the proposed extension certainly adds high altitude species to the existing property and also improves the habitat connectivity within the property for a number of other species. Some of the peripheral parts of the proposed extension, in particular above the town of Bansko, include former pastures and plantations, which are currently undergoing a process of natural succession.

The property is located in a region which has been the subject of rapid tourism development, notably in relation to the construction of the Bansko ski

resort within the existing property, but not in the proposed extension. This resort development has had a significant impact on the values and integrity of the property, with particular damage done to the pine forests above the town of Bansko.

The State Party now proposes to extend the existing World Heritage property to include the whole of Pirin National Park except for two designated tourism zones whose values and integrity is no longer compatible with World Heritage status as detailed in Section 4 of this report and illustrated on Maps 1 and 2. More information on the boundary changes and integrity issues is provided in Section 4 of this report.

3. COMPARISONS WITH OTHER AREAS

The existing World Heritage property was inscribed on the World Heritage List under criteria (vii), (viii) and (ix) because of its mountain scenery, glacial geomorphology, and the continuing evolution of the flora, as evidenced by a number of endemic and relict species. The proposed extension would strengthen the values, integrity and management of the existing property under these criteria and thereby contribute to the long term conservation of the Outstanding Universal Value of the property. However, as the extended property has also been nominated under the additional criterion (x), it is necessary to compare the values of Pirin National Park for biodiversity and threatened species with other comparable World Heritage properties and protected areas in the region and globally.

Pirin National Park is part of the biogeographical province of the Balkan Highlands. Other World Heritage properties in the region include Plitvice Lakes National Park (Croatia) and Durmitor National Park (Montenegro). Plitvice Lakes National Park is mainly a forest area which was inscribed for its outstanding travertine formations. Durmitor National Park is a high mountain area like Pirin and includes the Tara Gorge and pine forests. Other comparable mountain areas in the region include the following: Sutjeska National Park (Bosnia and Herzegovina); Rila National Park (Bulgaria); Galičica National Park and Pelister National Park (Former Yugoslav Republic of Macedonia); Mount

Olympus Mountain and Mount Tymphi (Greece); Sara National Park (Serbia); and the planned Prokletje National Park (Montenegro).

In terms of biodiversity and threatened species, the values of Pirin National Park are comparable to a number of these other areas in the region. For example, Mount Olympus (Greece) has 1,700 vascular plant species (23 endemics) and Montenegro's planned Prokletje National Park 1,609 (20 endemics), compared to 1,315 (18 endemics) for Pirin National Park. The floral and faunal diversity of Pirin National Park, although important at the national level, does therefore not stand out when compared with other mountain areas in the region.

At the global level, Pirin National Park ranks far lower in terms of biodiversity and threatened species when compared with many mountain areas. It is much smaller and features far less species and habitats than other mountain World Heritage properties such as the Canadian Rocky Mountain Parks (Canada), Western Caucasus, Golden Mountains of Altai and Central Sikhote-Alin (Russian Federation), and the Great Smoky Mountains National Park (USA).

4. INTEGRITY

4.1 Protection

The existing World Heritage property, with the exception of the four small areas on the periphery of the property that have been excluded from Pirin National Park in 1987 and 1999, and proposed extension are State-owned and designated as a national park under Bulgarian Law. This status provides a legal basis for the protection of the values and integrity of the property, however, the development of the Bansko ski resort within the national park, which has significantly damaged the values and integrity of the property, calls into question the effectiveness of the protection status of the existing property and proposed extension.

IUCN considers the protection status of the proposed extension meets, in theory, the requirements set out in the Operational Guidelines. However, in practice, the effectiveness of the protection status is questionable and will very much depend on the political will of the State Party to ensure its effectiveness.

4.2 Boundaries

The boundaries of the existing World Heritage property do not follow an ecological rational and create a highly fragmented property with a low level of integrity. The proposed extension of 12,136.02 ha (see Table 1 and Map 1) will significantly enhance

the integrity of the property by connecting currently isolated areas to form a single ecological unit based on the current boundaries of Pirin National Park.

In line with previous recommendations by UNESCO and IUCN, the State Party also proposes to exclude from the World Heritage property the Bansko and Dobrinishte tourism zones (comprising 1078.28 ha in total located within the national park) from the World Heritage property and include them in a new buffer zone (see Maps 1 and 2). These tourism zones include major infrastructure such as the main access road to the park, five hotels, large ski facilities (including cabin lifts, chair lifts and drag lifts) and ski runs, a biathlon centre for all-year use and artificial water reservoirs to make artificial snow, and are thus not compatible with World Heritage status.

The State Party also proposes to exclude from the World Heritage property four small areas (150.6 ha in total) on the periphery of the property that were excluded from the national park in 1987 and 1999 (see Map 1). These areas have limited values, and are no longer protected and managed as part of the national park, and are thus no longer compatible with World Heritage status.

The Park Directorate has marked clearly the boundaries of Pirin National Park above Bansko and in other critical areas. Further marking of other areas in the field is planned for the future, subject to available funding. The proposed exclusion of the Bansko and Dobrinishte tourism zones from the World Heritage property, if accepted, should be reflected in any maps and other information material concerning the World Heritage property. Such maps and other information material should also clearly show the limits of the area of existing ski facilities and ski runs, as well as other buildings and facilities, at the time of inscription of the proposed extension on the World Heritage List.

IUCN considers that the boundaries of the proposed extension meet the requirements set out in the Operational Guidelines as the area included would strengthen the integrity and management of the World Heritage property. IUCN also concurs with the other boundary changes proposed by the State Party.

4.3 Management

The management of Pirin National Park is under the responsibility of the National Nature Protection Service of the Ministry of the Environment and Water, which is responsible for the coordination and control of Bulgaria's protected areas. The Pirin National Park Directorate is responsible for the on-the-ground management of the national park and applies the government policy concerning the national park.

Table 1. Summary of the proposed boundary changes

	Property	Buffer zone
Area of existing property (ha)	27,442.9	0
Area of proposed extension (ha)	+12,136.02	0
Area of proposed exclusions on the periphery of the property (ha)	-150.6	0
Area of proposed exclusion of the Bansko and Dobrinishte tourism zones and their proposed inclusion in a new buffer zone (ha)	-1078.28	+1078.28
Total area (ha)	39,277.72	1078.28

Note: minor discrepancies in these figures are due to more accurate area measurements in the nominated extension.

The Pirin National Park Administration employs some 50 staff. This includes five chief inspectors, or senior rangers, for each of the park's management regions as well as some 30 rangers. All staff and administration costs of Pirin National Park are funded by the State budget. The level of this funding has remained relatively constant in recent years. According to the State Party, Bulgarian Leva (BGN) 517,278 (roughly USD 350,000) has been approved for 2009, which is lower than in 2006-2008 but higher than in 2004-2005. The main source of funding for the implementation of conservation measures in Pirin National Park is the State Enterprise for Management of Environmental Protection Activities (SEMEPA) established by Bulgaria's Environmental Protection Act. The level of SEMEPA funding has fluctuated significantly in recent years: it dropped from BGN 706,600 (roughly USD 482,000) in 2004 to 87,100 (roughly USD 59,000) in 2007. However, according to the State Party, BGN 745,690 has been approved for 2009. IUCN notes that the effective management of the property will continue to depend on the allocation of adequate funds.

Since 2004 Pirin National Park is managed according to a management plan approved by Decision #646 of the Council of Ministers. The management plan was developed for the period 2004-2013 and designates six zones with different objectives within the national park:

- **Reserve zone** (IUCN Category Ia; 14.8% of the park's territory): This zone includes the strictly protected Yulen and Bayuvi Doupki-Dzhindzhiritza Reserves. Human activities are limited to scientific research and passing of people along marked trails only;
- **Zone of limited human impact** (Ib; 20.3%): Human activities are limited to scientific research and hiking along marked trails only;
- **Zone for conservation of forest ecosystems and recreation** (IIa; 45.2%): Permitted activities include hiking and recreation, angling, collecting mushrooms, herbs and fruits for personal use, passing of domestic animals on defined trails, maintenance and restoration activities in the

forests and regulating the numbers of certain animal species;

- **Zone for sustainable use of open areas and recreation** (IUCN Category IIb; 16.9%): Permitted activities include all of the above plus grazing of sheep, cattle and horses. This zone is mainly reserved for traditional grazing activities;
- **Tourism zone** (IUCN Category III; 2.2%): This zone is proposed to be excluded from the park and to be included in a new buffer zone. Permitted activities include all of the above plus sports such as skiing, horse-back riding and cycling along defined trails, and climbing and caving in defined areas. According to the management plan, no construction of any buildings and facilities is permitted in this zone;
- **Zone of buildings and facilities** (IUCN Category IV; 0.6%): This zone includes the buildings and facilities of the Bansko and Dobrinishte ski resorts and is proposed to be excluded from the park and to be included in a new buffer zone. The management plan permitted the construction of the Bansko ski resort according to the adopted Territorial Arrangement Plan and its Environmental Impact Assessment of 2000. According to the management plan, no construction of any buildings and facilities is permitted in the national park outside this zone. For the purpose of readability, the tourism zone and zone of buildings and facilities are referred to in this report jointly as "Bansko and Dobrinishte tourism zones".

The implementation of the management plan was reviewed in 2008; however, no changes to the management plan were approved. The process to develop the new management plan for the period post 2013 is planned to commence in 2010. In order to assure the protection and conservation of the Outstanding Universal Value of the property, it will be essential for the State Party to ensure that the new management plan does not permit further ski development or construction of other ecologically

unsustainable facilities within the property and its buffer zone, nor extension of the tourism zone into the property. In the past, the influence of the responsible authorities on the development of the Bansko ski resort appears to have been limited, given the repeated unauthorized modifications and violations of approved requirements within the existing property (see also Section 4.4 below).

IUCN considers the management plan of Pirin National Park, which covers the proposed extension, meets the requirements set out in the Operational Guidelines and will strengthen the management of the World Heritage property. IUCN considers it, however, imperative that the responsible authorities exert effective control over Pirin National Park to prevent any developments that would further damage the values and integrity of the property (see also Section 5.1 below).

4.4 Threats and human use

The World Heritage property has long been subject to tourism pressure, largely caused by the development of ski facilities and ski runs. Small ski areas were developed at Bansko, Dobrinishte and Kulinoto in the 1980s and 1990s. In 1999, the World Heritage Centre was informed by the State Party about plans to develop a major ski resort above Bansko, and in 2001 the State Party issued a concession for the construction of the Bansko ski resort to Ulen Company. The main phase of construction of the Bansko ski resort took place from 2002 to 2004; however, further work on ski facilities and ski runs continues to date, with an upgrade of the Bansko biathlon centre for all-year use underway during the IUCN field visit in October 2009. IUCN also notes that night skiing, off-piste skiing and heliskiing are all being advertised and practised in the Bansko ski resort according to its marketing materials; however, at present it is unclear to what extent these activities affect the values and integrity of the property.

The construction of the required ski facilities and ski runs in the park's zone of buildings and facilities, which has not affected the proposed extension, was authorized through the Territorial Arrangement Plan (TAP) and its Environmental Impact Assessment (EIA) of 2000, and the park's management plan adopted in 2004. However, a number of unauthorized modifications and violations of the TAP and EIA requirements have occurred. These have not only damaged or disturbed the areas inside the zone of buildings and facilities and tourism zone of the property, but also affected areas of the property outside these zones. In October 2009, following NGO submissions concerning developments in the Bansko ski resort, which is part of the proposed Natura 2000 site Pirin, the Directorate-General for the Environment of the European Commission started an infringement procedure. It is expected

that the State Party will submit its response to the NGO submissions in due course. IUCN considers that the State Party should also submit its response to the World Heritage Centre when it is prepared.

Bansko has become one of the most rapidly developing towns in Bulgaria. A number of hotels and holiday resorts were constructed literally on the park boundary. The capacity of the current Bansko ski resort is insufficient in relation to the number of tourists that can be accommodated in the hotels and holiday resorts of Bansko. Hence there are plans by the municipality of Bansko and Ulen Company to expand the Bansko ski resort. Current sketch maps of the resort still show, for example, a closed ski lift and ski run outside both the tourism zone and zone of buildings and facilities (see Map 3). Plans to re-open this ski lift and ski run are not compatible with the management plan and should not be permitted. Other municipalities around the park have plans to develop new ski resorts and/or expand the existing Dobrinishte and Kulinoto ski areas. One such plan is for a new ski resort of three times the size of the Bansko ski resort and would also affect the proposed extension. None of these plans are in line with the current management plan of the park and/or have been approved by the responsible Ministry for Environment and Water. In a meeting during the IUCN field visit, the Deputy Minister for Environment and Water in fact asserted that no further ski developments in the park would be approved. However, tourism development within and around the property has not been effectively controlled in the past, and it remains to be seen if the State Party is able to protect the values and integrity of the extended property against further tourism pressure.

In the view of IUCN, the Bansko ski resort (see Photo 1) cannot be considered a sustainable use of an existing World Heritage property as per paragraph 119 of the Operational Guidelines, and is therefore not in line with the conservation objective of the World Heritage Convention. The development of the Bansko ski resort has made it necessary to exclude the Bansko tourism zone from the World Heritage property and to include it in a new buffer zone. In order to maintain the values and integrity of the World Heritage property it will be critical to ensure that no further ski development or construction of other facilities takes place within the property and its buffer zone, and that the tourism zone is not extended into the property. It will also be critical to ensure that the existing ski facilities and ski runs comply with the requirements of the TAP, EIA and management plan, including those for the recultivation of degraded areas. Any further tourism development in Pirin National Park should be ecologically sustainable and utilize the yet under-realized potential of the property to develop more environmentally friendly forms of tourism. Other threats to the property that need to be

monitored and managed include illegal logging, hunting and grazing. While illegal logging seems to be currently under control in both the property and proposed extension, illegal hunting (mostly of chamois) is reported to occur occasionally and needs to be controlled. Grazing is permitted in zones IIb, III and IV of the park and low intensity grazing in these zones is considered to be ecologically sustainable; however, the extent and intensity of grazing needs to be controlled continuously in order to prevent overgrazing.

During the IUCN field visit it was noted that the park's walking trails are well managed and maintained, and that relevant park information and regulations are posted at all major trailheads and entry points. However, activities such as skiing, horse-back riding and cycling, or the use of snow mobiles and quad bikes, will have to be closely monitored and managed, and existing regulations enforced.

IUCN considers that the area of the proposed extension, which has not been affected by the ski developments, meets the conditions of integrity as set out in the Operational Guidelines and will strengthen the integrity of the World Heritage property. IUCN considers it, however, imperative that the responsible authorities examine the impact of activities such as night skiing, off-piste skiing and heliskiing, and the use of snow mobiles and quad bikes, and exert effective control over Pirin National Park to prevent any activities and use that would damage the values and integrity of the property.

Given the continuing and rising pressure on the property, IUCN considers it important that a joint UNESCO / IUCN monitoring mission visits the property in 2011 to assess the state of conservation of the property, with particular reference to its effective protection from inappropriate development and human use within and beyond its boundaries, and to review a draft of the new management plan.

5. ADDITIONAL COMMENTS

5.1 Values and integrity of the existing World Heritage property

IUCN considers that the values and integrity of the property have been repeatedly and significantly compromised by the development of ski facilities, to the extent that the property could be considered for inscription on the List of World Heritage in Danger. After careful consideration, extending the property, removing the compromised areas from the property, and minimising or mitigating the adverse effects provides a means to redress this particular situation. However, IUCN considers that the World Heritage Committee should make it entirely clear that further ski development or extension of the tourism zones

that compromise the values and integrity of the property is incompatible with its World Heritage status and would result in the inscription of the property on the List of World Heritage in Danger. IUCN is also of the view that further damage to the property from ski development could eventually result in the deletion of the property from the World Heritage List.

IUCN notes that its recommendations in this report apply to the particular circumstances of the Pirin National Park World Heritage property and do not represent an appropriate model or precedent for other World Heritage properties facing development pressure. While a case by case consideration seems necessary there should be generic guidance for major development of sporting facilities affecting World Heritage properties.

5.2 Use of the World Heritage Emblem

In line with the Operational Guidelines and taking into account possible future changes currently being discussed, the State Party should take all possible measures to prevent the inappropriate use of the World Heritage Emblem, such as its use in marketing materials for the Bansko ski resort.

6. APPLICATION OF CRITERIA

The extended property has been nominated under criteria (vii), (ix) and (x), although the existing World Heritage property was inscribed under criteria (vii), (viii) and (ix). IUCN considers that the proposed extension should be approved under the original criteria, in order to strengthen the integrity and management of the property in relation to these criteria, but that the extended property does not meet criterion (x) based on the following assessment:

Criterion (x): Biodiversity and threatened species

The importance of Pirin National Park for the *in situ* conservation of biological diversity and threatened species is not significant at the global level. Its values are typical of several mountain ranges within the Balkan Peninsula. Similar species and habitats are found in a number of other protected areas of the Balkan Highlands. The floral and faunal diversity of Pirin National Park, although important at the national level, does not stand out when compared with other mountain areas in the region. At the global level, Pirin National Park ranks far lower in terms of biodiversity and threatened species when compared with many mountain areas. It is much smaller and features far less species and habitats than a number of other mountain World Heritage properties.

IUCN considers that the extended 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-10/34.COM/8B** and **WHC-10/34.COM/INF 8B2**;
2. Recalling Decision **33 COM 7B.21**, adopted at its 33rd session (Seville, 2009);
3. Approves the extension of the **Pirin National Park, Bulgaria**, inscribed under criteria (vii), (viii) and (ix), in order to strengthen the integrity and management of the World Heritage property;
4. Adopts the following **Statement of Outstanding Universal Value**:

Brief synthesis

The World Heritage property covers an area of around 40,000 ha in the Pirin Mountains, southwest Bulgaria, and overlaps with the undeveloped areas of Pirin National Park. The diverse limestone mountain landscapes of the property include over 70 glacial lakes and a range of glacial landforms, with many waterfalls, rocky scree and caves. Forests are dominated by conifers, and the higher areas harbour alpine meadows below the summits. The property includes a range of endemic and relict species that are representative of the Balkan Pleistocene flora.

Criteria

Criterion (vii): *The mountain scenery of Pirin National Park is of exceptional beauty. The high mountain peaks and crags contrast with meadows, rivers and waterfalls and provide the opportunity to experience the aesthetics of a Balkan mountain landscape. The ability to experience remoteness and naturalness is an important attribute of the Outstanding Universal Value of the property.*

Criterion (viii): *The principal earth science values of the property relate to its glacial geomorphology, demonstrated through a range of features including cirques, deep valleys and over 70 glacial lakes. The mountains of the property show a variety of forms and have been developed in several different rock types. Functioning natural processes allow for study of the continued*

evolution of the landforms of the property, and help to understand other upland areas in the region.

Criterion (ix): *The property is a good example of the continuing evolution of flora, as evidenced by a number of endemic and relict species, and the property also protects an example of a functioning ecosystem that is representative of the important natural ecosystems of the Balkan uplands. Pirin's natural coniferous forests include Macedonian Pine and Bosnian Pine, with many old growth trees. In total, there are 1,315 species of vascular plants, about one third of Bulgaria's flora, including 86 Balkan endemics, 17 Bulgarian endemics and 18 local endemics. The fauna of Pirin National Park includes 45 mammal species, including brown bear, wolf and pine marten, and 159 bird species. Pirin is also home to eight species of amphibians, eleven species of reptiles and six fish species. Although the forests are affected by some historical use, the natural functioning of the ecosystem ensures the protection of its regionally significant biodiversity values.*

Integrity

The original inscription of the property in 1983 proved to be inadequate in representing and maintaining the Outstanding Universal Value of Pirin, but an extension in 2010 has addressed the issues to the best possible degree and represents the minimum area of Pirin National Park that can be considered to correspond to the requirements of Outstanding Universal Value set out in the World Heritage Convention.

The National Park is clearly defined from the point of view of its mountainous nature and ecology, and the boundaries of the property are of sufficient size to capture the natural values of Pirin. Adequate boundaries have been established through the extension of the initially inscribed property, to include the most remote areas of the interior of the National Park, and exclude adjacent areas that are not compatible with World Heritage status due to impacts on integrity from ski development. The values of the property as extended retain the attributes of a natural landscape but they closely adjoin areas subject to intensive tourism development that are a risk to the integrity of the property.

Management and protection requirements

The property is covered by national legislation which should ensure strong national protection of the values of the

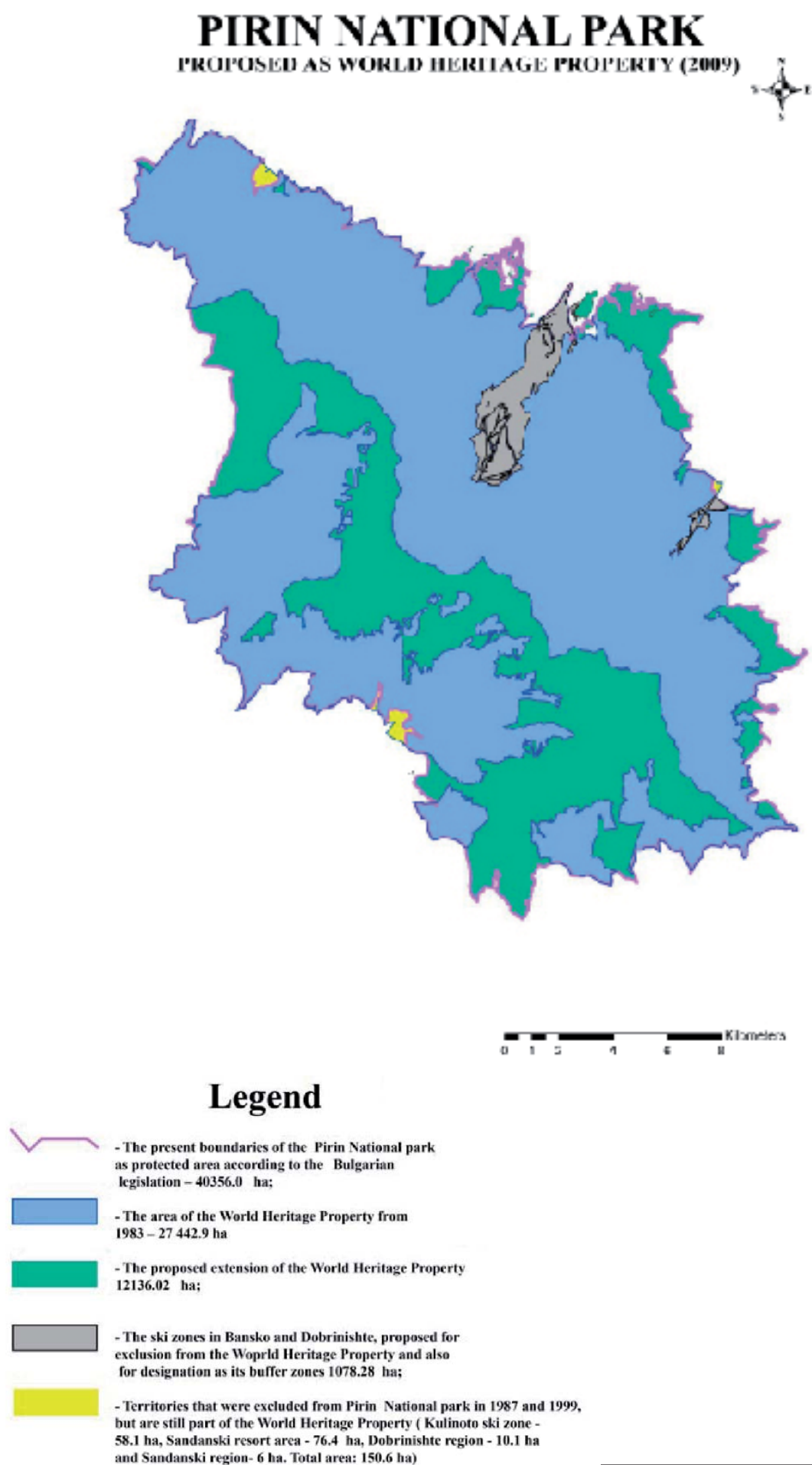
property, including the prevention of encroachment from adjoining development. It is essential that this legislation is rigorously enforced and is respected by all levels of government that have responsibilities in the area. The property also has an effective and functioning management plan, provided its implementation can be ensured through adequate resources to both maintain the necessary staffing levels and undertake the necessary management activities to protect and manage the property. A system of regular monitoring of the natural values of Pirin and ongoing programmes to maintain habitats and landforms in their natural state, avoid disturbance and other impacts on wildlife, and to preserve the aesthetic values of the property are required.

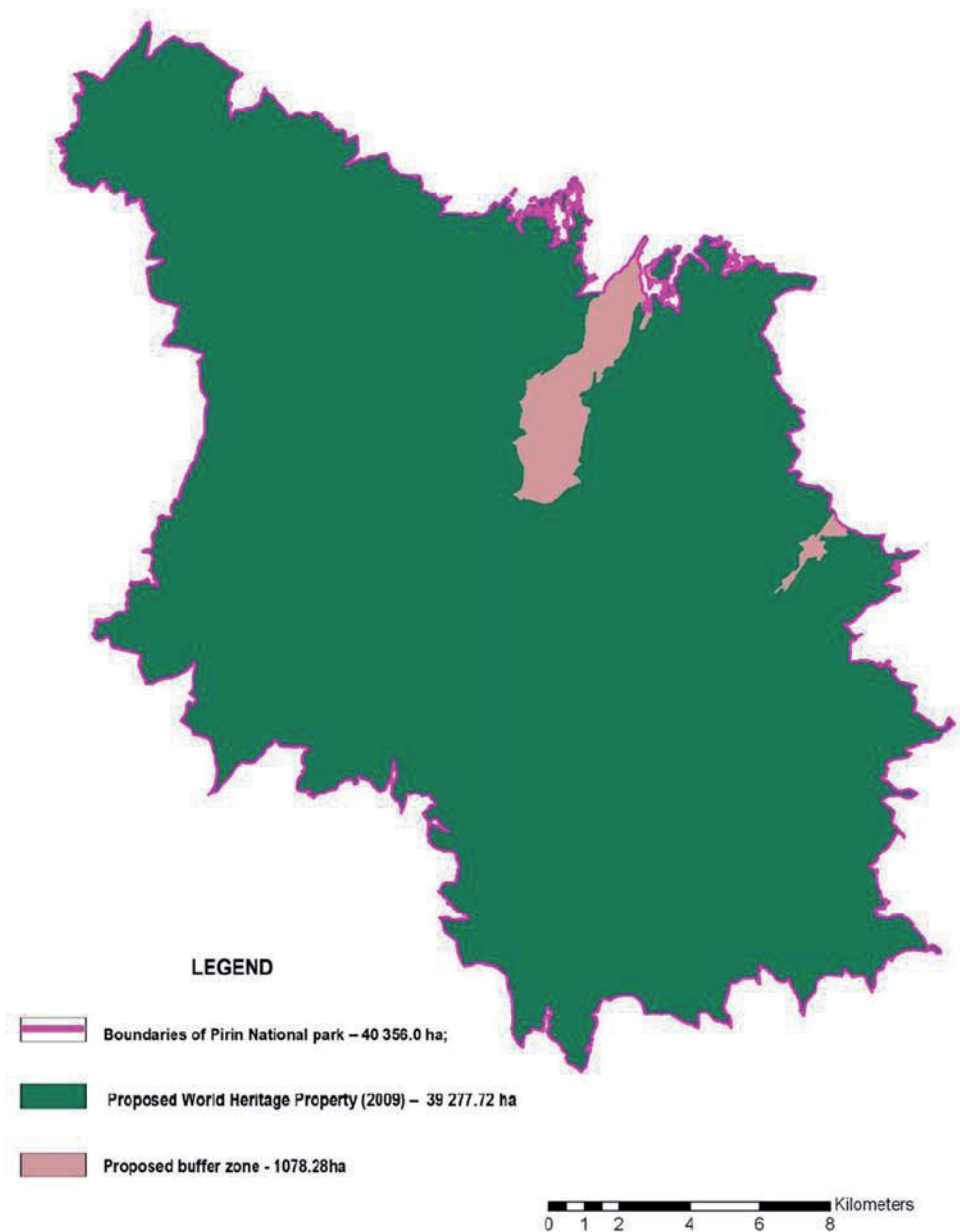
The World Heritage property has long been subject to tourism pressure, largely caused by the development of ski facilities and ski runs. Small ski areas were developed at Bansko, Dobrinishte and Kulinoto in the 1980s and 1990s. Activities such as night skiing, off-piste skiing and heliskiing are activities which may affect the values and integrity of the property and require rigorous control. Bansko, adjoining the property, has become one of the most rapidly developing towns in Bulgaria with hotels and holiday resorts constructed literally on the park boundary. Tourism development within and around the property has not been effectively controlled in the past including some areas that were developed within the property and caused significant damage. The management plan for the property needs to ensure a long-term priority for the protection of the natural values of Pirin, and to guard against any encroachments and impacts within the property from skiing, sporting events or other inappropriate development. Equally the planning documents that are created by national, regional and local authorities need to similarly ensure the protection of the natural values of the property, and also integrate the benefits it provides as a natural landscape to the surrounding area.

Other threats to the property include illegal logging, poaching and the use of snow mobiles and quad bikes. These uses require close monitoring, management and the enforcement of effective regulations. The management of visitor use to both prevent negative impacts and provide opportunities to experience the values of the property in a sustainable way is also an essential long term requirement for this property.

5. In the specific context of the above extension, accepts the proposal of the State Party to exclude from the property four small areas (150.6 ha in total) on the periphery of the property which have been excluded from the national park; and also accepts the proposal of the State Party to exclude from the property the Bansko and Dobrinishte tourism zones (1078.28 ha in total), and to include these latter areas, which are still within the national park, in a new buffer zone;
6. Regrets that the **Outstanding Universal Value** of the property has been repeatedly and significantly impacted by the development of ski facilities and ski runs, to the extent that the property may be considered for inscription on the List of World Heritage in Danger, and that continued ski development is a critical threat to the Outstanding Universal Value of the property;
7. Requests the State Party to strictly ensure that no further ski development takes place within the property and its buffer zone, and to ensure that the existing ski facilities and ski runs comply with the approved requirements, including those for the restoration of degraded areas;
8. Decides that any further development of and severe impacts from ski facilities or ski runs, or associated infrastructure, within the property and its buffer zone would result in the inscription of the property on the **List of World Heritage in Danger**;
9. Urges the State Party to ensure that the new management plan to be developed for the period post 2013 will not permit further ski development or construction of other ecologically unsustainable facilities within the property and its buffer zone, nor extension of the tourism zone into the property;
10. Also urges the State Party to take all possible measures to prevent the inappropriate use of the World Heritage Emblem, including by not allowing its use in relation to the Bansko ski resort, which cannot be considered a sustainable use of a World Heritage property; and encourages the State Party to explore and enhance options for ecologically sustainable tourism in the property that will benefit local communities;

11. Requests the State Party to invite a joint World Heritage Centre/IUCN monitoring mission to the property in 2011 to assess the state of conservation of the property, with particular reference to its effective protection from inappropriate development and human use within and beyond its boundaries and to review a draft of the new management plan to ensure that it will provide for the continued protection of the Outstanding Universal Value of the property;
12. Also requests the State Party to submit to the World Heritage Centre, by 1 February 2011, a report on the state of conservation of the property, with particular reference to its effective protection from inappropriate development and human use within and beyond its boundaries, for examination by the World Heritage Committee at its 35th session in 2011. This report should include the State Party response to the NGO submissions that resulted in an infringement procedure by the Directorate-General for the Environment of the European Commission.

Map 1: Overview of the proposed boundary changes.

Map 2: Proposed boundaries of the World Heritage property and its buffer zones.

Map 3: Sketch map of the Bansko ski resort still showing the closed Ctzurna mogila ski lift and ski run to the right. This closed ski lift and ski run is outside both the tourism zone and zone of buildings and facilities, which are proposed for exclusion from the World Heritage property and inclusion in a new buffer zone, and will thus remain within the property. Plans to re-open this ski lift and ski run are against the management plan and should not be permitted. (Source of map: www.banskoski.com)



Photo 1: The higher part of the Bansko ski resort which was constructed within the existing World Heritage property. This part of Pirin National Park is proposed for exclusion from the World Heritage property and inclusion in a new buffer zone. (Source of photo: www.banskoski.com)



EUROPE / NORTH AMERICA

MONTE SAN GIORGIO

ITALY



WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

MONTE SAN GIORGIO (ITALY) - ID N° 1090 bis

Background note: Monte San Giorgio in Switzerland was inscribed on the World Heritage List at the 27th Session of the World Heritage Committee (Paris, 2003) under natural criterion (viii). The original nomination mentioned the values in Switzerland and Italy, and the IUCN evaluation at that time also considered the related natural values in both countries. The relevant decision (27COM 8C.7) requested follow up action by the State Party of Switzerland in relation to the marking of boundaries, and the development of on site interpretation. The decision also encouraged “the authorities of Switzerland and Italy to collaborate in a proposal for a transboundary extension of the property into Italian territory, once satisfactory levels of political commitment have been attained and it is clear that the conditions of integrity can be met.” The nomination for extension that is the subject of evaluation below was submitted by the State Party of Italy, with an accompanying official letter of endorsement from the State Party of Switzerland.

1. DOCUMENTATION

- i) **Date nomination received by IUCN:** 16th March 2009.
- ii) **Additional information officially requested from and provided by the State Party:** The States Parties of Italy and Switzerland both provided supplementary information in response to two questions raised by the IUCN World Heritage Panel.
- iii) **UNEP-WCMC Data Sheet:** Last updated in August 2007, sourced from original nomination.
- iv) **Additional Literature consulted:** Brack, P., Mundil, R., Oberli, F., Meier, M., Rieber, H. (1996) **Biostratigraphic and radiometric age data question the Milankovitch characteristics of the Latemar cycles (Southern Alps, Italy)**. *Geology* 24: 371-375. Brack, P. Rieber, H., Nicora, A., Mundil, R. (2005) **The Global boundary Stratotype Section and Point (GSSP) of the Ladinian Stage (Middle Triassic) at Bagolino (Southern Alps, Northern Italy) and its implications for the Triassic time scale**. *Episodes* 18: 233-244. Bottjer, D.J., Etter, W., Hagadorn, J. W. (2002) **Fossil-Lagerstätten: Jewels of the fossil record**. In: Bottjer D. J., Etter, W., Hagadorn, J. W., eds. *Exceptional Fossil Preservation: A Unique View on the Evolution of Marine Life*. New York: Columbia University Press, 2002. 1–10. Felber et al. (2004) **Ecologiae Geologicae Helveticae** 97: 1-2. Felber (2005) **Il Monte San Giorgio**, Edizioni Casagrande, Bellinzona. *Geologica Insubria* (2007) Volume 10. **Special issue on Viggiù quarries**. Hao, W., Sun, Y., Jiang, D., Sun, Z. (2006). **Advance in Studies of the Panxian Fauna**. *Acta Scientiarum Naturalium Universitatis Pekinensis* 42: 817-823. Renesto et al. (2003) *J. Vertebrate Palaeontology* 23: 957-960. Rieppel (1989) *Phil. Trans, R. Soc. Lond. B323*: 1-23. Rieppel and Bucher (2003) *J. Vertebrate Palaeontology* 20: 507-514. Seilacher et al. (1985) *Phil. Trans, R. Soc. Lond. B311*: 5-23. UNEP /WCMC (2007) **Report on Monte San Giorgio (Switzerland) WHS. Earth Heritage, World Heritage: A global strategy for geological World Heritage**. Dingwall P., Wieghell, T. and Badman T., IUCN Gland, (2005) 51 pp. A range of other academic articles were also consulted.
- (v) **Consultations:** Nine external reviewers. Extensive consultations were undertaken during the field visit with the Representative from the *Ministero per i Beni e le Attività Culturali*, governmental Officials from the Lombardy – Milan Region, governmental Officials from the Province of Varese, local Municipal (Commune) Officials, including Mayors and Deputy Mayors, local museum staff, the delegation from Swiss Monte San Giorgio World Heritage property, Swiss Government and regional officials, the expert team responsible for preparing the nomination and representatives from local community groups.
- vi) **Field visit:** Bernard Smith, September 2009.
- vii) **Date of IUCN approval of this report:** 15th May 2010.

2. SUMMARY OF NATURAL VALUES

Monte San Giorgio (MSG) is a pyramid-shaped, wooded mountain that rises to an altitude of 1,096m above sea level and which lies to the south of Lake Lugano. It lies across the border between Italy and Switzerland. The area of the existing inscribed property in Switzerland is 849 ha, lying within the communes of Meride, Riva San Vitale and Brusino Arsizio. The existing property is adjoined by a buffer zone of 1,389 ha of land, and territory within a further six communities in Switzerland. The entire area of the existing property and its buffer zone are a Landscape Protection Zone (LPZ) under Swiss Law.

The nominated extension is contiguous with the existing property and lies within an area identified as a LPZ under Italian law and comprises the part of this protected zone that contains the main fossiliferous deposits. The total area of the nominated extension is 240.34 ha, lying within the Communes of Besano, Porto Ceresio and Viggiù. The remaining part of the LPZ (1824.15 ha) surrounds this area and is identified as a buffer zone to the property including land in two additional communes: Clivio and Saltrio.

The values of the nominated extension relate to its fossil record from the Triassic, an important period of geological history, which witnessed major radiations of both reptiles and actinopterygian fish. The Middle Triassic rock succession of MSG rests unconformably on older, Permian volcanic rocks which are exposed on the north face of MSG, and is overlain by Upper Triassic, and Lower Jurassic rocks. The Middle Triassic sequence consists of approximately 1,000 meters of reef limestones, dolomites and bituminous shales which formed in marine conditions on the margins of the Triassic Tethys Ocean. The exceptional fossil interest within the sequence arises because of the presence of six distinct, fossiliferous formations, the Grenzbitumenzone, the Cava Inferiore, Cava Superiore, Cassina Beds, Crocifisso Bed and the Kalkschieferzone. The distribution and abundance of different fossil groups in the six different levels is variable, with the greatest diversity of material and most spectacular discoveries having been found within the Grenzbitumenzone. Specimens yielded by the Kalkschieferzone are of great scientific interest because of their exceptional preservation of 'soft' and delicate material (very small fishes, reptile embryos, insects and other arthropods). The sequence records life in a tropical lagoon, and the fossil remains also include some land-based fossils including reptiles, insects and plants.

There are a number of features that render exceptional importance to the fossil resource

of MSG. This includes the exceptional quality of preservation of material (including both complete skeletons of marine and land reptiles, and the display of minute detail including internal features such as stomach contents and embryos), the number of unique and first discoveries of species that have been made at MSG, and the presence of six superimposed fossil layers, allowing evolutionary and comparative studies, and a number of features within the sedimentary sequence that allow precise dating. Excavations have produced more than 21,000 fossil specimens, representing 30 species of reptiles, 80 species of fish, c.100 macro-invertebrates, and 3 plant species. This is in addition to microfossil material that includes spores, pollen and marine microorganisms. The vertebrate material includes particularly spectacular specimens. Other finds include complete skeletons of ichthyosaurs, nothosaurs, placodonts, and the 'giraffe necked' saurian, *Tanystropheus*. The land-based fauna is more restricted, but includes a significant and complete skeleton of the archosaur, *Ticinosuchus*, the first complete skeleton from this group to be discovered in the northern hemisphere.

It is significant that the area has been the subject of detailed study for over 150 years, resulting in a rich scientific literature of over 800 papers reviewing the fossils and many aspects of the detailed geology of the deposits. Strict, systematic and continuous scientific research carried out for almost 150 years in Italy and Switzerland, almost exclusively by the Universities of Zürich and Milan, has resulted in a remarkably complete and coordinated record of the site's richness and diversity.

The nominated extension provides important complementarity to the existing inscribed property in Switzerland which covers the larger part of the fossiliferous strata. The Italian areas of MSG has produced a palaeontological record that is rich and diverse. This includes some 35 species of reptiles and almost 100 species of fish (some of them not yet fully described), exceptionally well-preserved insects and other arthropods, about 100 species of cephalopods, bivalves, gastropods, echinoderms, crustaceans and numerous plant species. There are lithological and faunistic differences between the nominated extension and the existing property and that the range of fish fossils is significantly larger and of better quality on in the Italian side of MSG. The dip of the strata has meant that on the Swiss side of MSG extensive excavations have typically been undertaken parallel to bedding planes, which has facilitated the exposure of more complete fossil specimens. In contrast, exposures on the Italian side are typically normal to the bedding planes. This makes the removal of complete specimens more difficult, but facilitates studies and interpretation in greater detail of the stratigraphic sequence. However the largest complete swimming reptile so far found on MSG, an articulated 6m skeleton

of *Besanosaurus*, is from a specimen found in Italy. The history of research on the Italian side of the border dates back to 1863, 60 years before the beginning of studies on the Swiss side of the border.

Although it is the geological significance of MSG that is the basis for the nomination, the area is also an attractive landscape of local to national importance, and demonstrates strong cultural links between the geology and the life of the local community, including in relation to stone working.

3. COMPARISONS WITH OTHER AREAS

Comparative analysis in relation to the value of MSG was undertaken by the State Party of Switzerland and augmented by IUCN at the time of the first inscription of the property. The previous evaluation already considered the values of MSG as a whole, and the previous nomination received significant contributions from Italian experts working on the nominated property. IUCN also completed its fossil checklist in relation to the values of MSG, which can be reviewed in the contemporary evaluation report.

At the time of the 2003 inscription of the Swiss MSG World Heritage property the majority of the independent experts consulted considered that MSG had a clear and fully substantiated claim as the principal global reference site for marine palaeontological sciences of the Triassic period. This view is also endorsed by global reviews commissioned by IUCN in relation to the property and the presently nominated extension.

The previous comparative analysis noted that the basis of the Outstanding Universal Value of MSG related to its marine Triassic fossils. These are superlative to the terrestrial records from Ischigualasto-Talampaya (Argentina). The Dorset and East Devon Coast includes a Triassic succession as part of a full exposure of the Mesozoic period, within a site with diverse geological and geomorphological values. Whilst the Triassic succession in this Site is more complete than MSG, the fossil record in terms of both quantity and quality is much lower and primarily restricted to terrestrial aspects. The records at MSG are complementary to the superlative marine Jurassic fossil record of Dorset and East Devon Coast, being of an older age.

The earlier comparative analysis also established the superlative nature of MSG, considering complementary sites in Australia, USA, South Africa, Russia, East and North Africa, Brazil, Spain and Central Europe. Significant new Triassic marine fossil material is now being discovered in Guizhou, China. The excellent preservation of the

Chinese material allows detailed comparisons with fossils from MSG, from a different faunal province. Evidence suggests that the Guizhou fauna could show the evolution of reptiles and fishes before and after those from MSG; though the real value of these new discoveries is still to be fully established. The material in China is also scattered over a much larger area than the compact area of Monte San Giorgio, and it appears that there are larger stratigraphical gaps between fossiliferous levels. Moreover, it is clear that MSG has preeminent importance by virtue of its long history of study and exceptionally rich and diverse suite of fossils. In summary, MSG continues to be considered as the best single fossil record of Triassic marine life globally.

4. INTEGRITY, PROTECTION AND MANAGEMENT

4.1 Protection

The nominated extension has effective legal protection. In total 43.4% of the nominated extension is in public ownership and 56.6% is owned by private landowners. Both the nominated property and its buffer zone lie within a Landscape Protection Zone recognised under Italian law (Area di rilevanza ambientale LR 86/1983). National, Regional, Provincial and Local legislative frameworks currently in place to protect the integrity of MSG appears to be adequate and it is effectively administered through the various tiers of government.

Since 1939, the protection of palaeontological heritage in Italy has been regulated by law and fossil material is considered to be property of the state. The most recent integration of laws regarding palaeontology defines all aspects of palaeontological heritage as cultural heritage and as such it comes under the control of the Ministry of Cultural Sites. Under this legislation, only approved institutions are permitted to research the area's palaeontological resources. In 2007 the municipalities of Besano, Porto Ceresio and Viggiù applied for a further paleontological constraint and safeguard on the palaeontological heritage of the area of the nominated extension.

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

4.2 Boundaries

The boundaries of the nominated extension and buffer zone in Italy have been traced following the same geo-paleontological principles used for the Swiss candidature. The limits of the nominated area are defined in accordance with the outcrop of the

fossiliferous formations of Middle Triassic age. The actual boundaries include all the localities where scientific excavations have been carried out in the past as well as historical mining sites. The proposed boundary of the buffer zone is related as far as possible to readily recognised geomorphological and anthropological features around the base of the mountain, such as the coast of Lake Lugano, rivers and major roads. This area also includes older (Permian and Pre-Carboniferous) and more recent (Jurassic and Cretaceous) geological units.

An important factor in relation to the overall integrity of the Triassic fossil is the linking of these boundaries to those of the existing Swiss property. It is understood that the Swiss State Party plans to submit a proposed revision of the boundary to remedy a potential anomaly on the southern margin of the Italian core zone, where its boundary does not join precisely with that on the Swiss side of the border due to previous differences in mapping the Triassic outcrop. Such a modification should also ensure precision in the linkages of buffer zones of the properties.

IUCN considers the boundaries of the nominated extension meet the requirements set out in the Operational Guidelines.

4.3 Management

As a fossil property the primary management requirement is related to the conservation of the fossil resource. Due to both the limited accessibility of the key exposures and the strict national regulation and permitting system, effective management is readily achieved. Only a limited number of excavations have been permitted by major organisations and institutions (e.g. Milan Museum, Milan University and the Museum of Induno Olona) and this has ensured not only an accurate and thorough recording of the finds, but also their detailed preparation and the widespread dissemination of findings. The integrity of the overall collection has been further enhanced by its concentration (99.9% of known specimens) in a limited number of locations at the Zurich, Lugano and Milano museums, together with a limited number of specimens at the small museums in Meride and Besano. These comprise a unique, consolidated, well-preserved, fully catalogued and well-protected resource, and thus continued strong links between the management of MSG and these institutions is essential.

Ongoing monitoring of key geological and palaeontological features will continue to be assured through strict application by the responsible authorities (Guardia di Finanza, Carabinieri, Guardie Ecologiche Volontarie) of the regulations contained within the national property law (Codice dei beni Culturali). The existence of several local

museums supported by numerous volunteers also results in an almost constant monitoring of key sites that would make any unauthorized excavation extremely difficult. The regional development plan and town-planning schemes (PRG) of the communes are regularly reviewed and updated and are key factors in ensuring the ongoing conservation of MSG. There is at present no overall process for monitoring the state of conservation of the site at regular intervals, and it is important that a system is put in place as early as possible that identifies appropriate indicators that can be used to assess the overall state of the environment, and issues for possible follow up action.

Human resources are dedicated to the protection and management of the nominated extension, mainly via part-time staff who have wider roles in hunting regulation, forest service and volunteer organisations. A range of educational and research activities is also supported across the proposed extension. The Lombardy Region support a part-time official to oversee excavations, and Milan and Insubria Universities have one part-time palaeontology researcher/technician each, Besano Museum has two part-time technicians as well as a part-time director and the full-time equivalent of a museum guide, Clivio Museum a part-time curator and a part-time director (as well as volunteers), and the Province of Varese a part-time officer for conservation of the historical Viggiù quarries. The need for a site manager with specific World Heritage responsibility in Italy, was raised as a key issue during IUCN's evaluation mission. In its supplementary information the State Party confirms that the five mayors of the communes in Italy signed an agreement on 1st December 2008 committing to nominating a site manager in Italy, and also confirm their commitment to ongoing funding for this position.

IUCN also confirmed during its evaluation mission that a central Visitor Centre would be established to mirror the new centre and museum under construction at Meride in Switzerland. A suitable building has already been allocated for this purpose in the commune of Clivio. This building currently serves as a resource centre for a range of community organisations related, and this important function would continue in the new Visitor Centre. Until the refurbishment of the Clivio building, the Meride Visitor Centre, will operate as the focal point for MSG as a whole. The above developments will maintain and improve the good existing level of visitor information provision associated with the variety of fixed centres that support MSG, and the exceptional off-site displays in the major museums in Zürich and Milan. There is a need to complement this more comprehensively with information at individual sites on the mountain and at access points. More proactive management

of the key excavation sites, including clearance of encroaching vegetation is also required.

Coordinated management of MSG as a single transboundary property is essential. This need has been fully recognised by the States Parties, which have developed a significant programme of transboundary cooperation since the nomination of the Swiss portion of MSG.

Following the inscription of the Swiss portion of MSG and the preparation of the management plan, Italian stakeholders in MSG signed an 'Agreement Protocol' in November 2008. This established an association to shadow the World Heritage Foundation established in Switzerland, and binds all signatories to collaborate in developing common strategies and projects. The association would re-form after approval of the extension as the management body for the Italian portion of the property. Local 'Technical Commissions' dealing with day-to-day environmental and commercial management would report to the Foundation.

In preparation for the nomination of Italian MSG, the State Parties of Switzerland and Italy also signed a formal memorandum of understanding in January 2009, which sets out the agreed coordinated transboundary management of the property if the Italian extension is approved. A European Union funded project has supported the development of a joint management plan for the whole of MSG including the extension into Italy. This collaboration was also the consequence of the 'Besano Protocol', signed in 2001 by 38 Swiss and Italian organisations, including 14 municipalities.

In accordance with the management plan, the successful inscription of Italian MSG would lead to the establishment of a 'Strategic Transnational Board' made up of the members of the two national foundations. The two site managers would also be in attendance, but have no voting rights. The role of the Board would be to establish and monitor the achievement of management priorities, programmes and targets for the transboundary property, to pursue funding options, to produce a single annual report and to promote and ultimately endorse transboundary designations for site protection. It has been agreed by the two State Parties that the presidency of the board will alternate between the two countries, beginning with a Swiss president.

IUCN considers that these efforts are highly commendable. Conclusion of the trans-boundary arrangements and their establishment on an ongoing basis with adequate funding will be essential to the long-term conservation of the property if the extension was approved. IUCN therefore requested supplementary information from the States Parties on the commitment to transnational management and explanation of how

its funding and effectiveness will be ensured. The response clarifies these arrangements and states that the association of mayors "undertake to raise structure funds from within national and international funding sources" for site management, once the site is inscribed. In addition to this response, the Swiss confederation confirms that it has a budget of CHF 525,000 in place over four years to 2011, in relation to the Swiss part of the property. IUCN considers it essential that the States Parties provide adequate financing in the medium to long term for the successful delivery of the management of the property on a transboundary basis.

IUCN considers the management of the nominated extension, and the planned transboundary management arrangements between the States Parties meet the requirements set out in the Operational Guidelines.

4.4 Threats

Although the main fossil resources are substantially unthreatened, continued operation of the management system as noted above is clearly an essential prerequisite to its long term protection.

There are limited other threats to the property. High mountain environments are proving to be particularly sensitive indicators of climate change. However, the almost complete forest cover on MSG should provide resilience in relation to changes, such as any projected increase in the intensity or frequency of extreme weather events. An almost complete vegetation cover does not guarantee immunity from erosion and there is some evidence of occasional landslides and rock falls, especially on the northwestern side of the property. These are of minor extent and significance in the context of the area as a whole. There is natural fluvial erosion along streams, which serves a potentially valuable role in revealing new fossiliferous exposures. Forest fires are a potential risk, but this is recognised and catered for within the forest management strategies that are in place.

The core of the nominated zone is uninhabited and there is effective enforcement of local planning legislation to regulate development pressures across the nominated extension and buffer zone. Arguably the most significant potential threat to the integrity of the nominated extension lies in the various strategies to develop its tourist potential. There is, however, little prospect of mass tourism on MSG and tourism strategies are focussed instead on attracting walkers to the mountain who are likely to be appreciative of its natural beauty and conscious of the need to preserve it. This approach is embodied in the drive to promote scenic and historic trails. If, as indicated, there are also moves to develop cycle and equestrian tracks it is essential that special consideration is given to their location

in terms of their potential for triggering localised erosion and decreasing the visitor experience of those on foot. Care should also be exercised in choosing appropriate access routes on to the mountain that could, for example, lead to the ad hoc creation of unofficial parking areas adjacent to or within the buffer zone.

In summary, IUCN considers the nominated extension in Italy, together with the existing property in Switzerland meet the integrity, protection and management requirements set out in the Operational Guidelines.

5. ADDITIONAL COMMENTS

5.1. Comments of ICOMOS

The IUCN evaluation mission noted the significance of the the long history of quarrying and the working of stone in the area around MSG. ICOMOS has also provided a brief assessment of the cultural values of this property to IUCN. ICOMOS note the association of many of the fossil finds with industrial and commercial exploitation of the area, and that Viggiú has a history dating from the Roman era. Martino Longhi the Elder (1534-1591) worked there, and founded a dynasty of architects whose principal work was in Rome. The area was noted for Viggiú stone and the art of stone-cutting. The notable Italian Renaissance estate/garden Villa Cicogna Mozzoni lies nearby but outside the buffer zone.

5.2. Geopark status

Planning and negotiation is in progress to designate the wider environment around central peak of MSG as part of a European Geopark network that will link a series of geosites across the Southern Alps as the 'Geoparco dell'Insubria'. Such a project could place MSG within its regional geological context and would further facilitate cross border coordination of information provision and sustainable tourism. IUCN considers care should be taken to retain the clear identity of the World Heritage property, and to ensure complementarity of the different rationales of the two designations. The potential for conflict has been recognized by the Swiss authorities, who have pointed out that the Geopark initiative cannot be taken forward directly by the World Heritage authorities, as the foundations do not have the required competence and the objectives are different.

6. APPLICATION OF CRITERIA

Monte San Giorgio, Switzerland, is already inscribed on the World Heritage List under criterion (viii). The proposed extension, which is contiguous

with the existing site, was recommended at the time of inscription and has been nominated under the same criterion.

Criterion (viii) Earth's history and geological features

Monte San Giorgio provides the single best-known record of marine life in the Middle Triassic period, as well as important evidence of life on land. The Site has produced diverse and numerous fossils, many of which show exceptional completeness and detailed preservation. These are found in a compact sequence of six superimposed levels that have allowed detailed reconstruction of the evolution of several groups of marine organisms. The long history of study, and the disciplined management of the resource, has created a thoroughly documented and well-catalogued body of specimens of exceptional quality that has generated a rich scientific literature. Monte San Giorgio thus provides the principal point of reference for future discoveries of marine Triassic remains throughout the world.

IUCN considers that the nominated extension, in combination with the existing inscribed property in Switzerland, meets this criterion.

7. RECOMMENDATION

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

The World Heritage Committee,

1. Having examined Documents **WHC-10/34.COM/8B** and **WHC-10/34.COM/INF 8B2**,
2. Approves the extension of **Monte San Giorgio, Italy/Switzerland**, on the basis of natural criterion (viii);
3. Adopts the following Statement of **Outstanding Universal Value**:

Brief synthesis

The pyramid-shaped, wooded mountain of Monte San Giorgio beside Lake Lugano is regarded as the best fossil record of marine life from the Triassic Period (245–230 million years ago). The sequence records life in a tropical lagoon environment, sheltered and partially separated from the open sea by an offshore reef. Diverse marine life flourished within this lagoon, including reptiles, fish, bivalves, ammonites, echinoderms and crustaceans. Because the lagoon was near to land, the fossil remains also include some land-based fossils including reptiles, insects and plants. The result is a fossil resource of great richness.

Criteria

Criterion viii: Monte San Giorgio is the single best known record of marine life in the Triassic period, and records important remains of life on land as well. The property has produced diverse and numerous fossils, many of which show exceptional completeness and detailed preservation. The long history of study of the property and the disciplined management of the resource have created a well documented and catalogued body of specimens of exceptional quality, and are the basis for a rich associated geological literature. As a result, Monte San Giorgio provides the principal point of reference, relevant to future discoveries of marine Triassic remains throughout the world.

Integrity

The property encompasses the complete Middle Triassic outcrop of Monte San Giorgio including all of the main fossil bearing areas. The Italian portion of the property included is an extension in 2010 of the originally inscribed area in Switzerland, which was added to the World Heritage List in 2003. The resulting extended property fully meets the integrity requirements for a fossil site. The main attributes of the Outstanding Universal Value of the property are the accessible fossiliferous rock exposures, with intact strata which occur in many parts of the property.

Protection and Management requirements

The property benefits from legal protection in both Italy and Switzerland that provides an effective basis for the protection of its geological resources. Site protection also focusses on landscape protection and has resulted in appropriate legislative controls and existing management procedures that are effectively enforced at the local level and which are underwritten by National, Regional and Provincial Government support.

Strong transboundary collaboration between the States Parties of Italy and Switzerland is in place, including mechanisms that are agreed by all of the local municipalities in both countries, through common signed accords and declarations. A joint management plan is also in place for the property, and the States Parties and local authorities are committed to providing adequate ongoing staffing and management resources to the property. Maintenance of the effectiveness of the transboundary cooperation and the related management plan is a key ongoing requirement for the protection of the property. Staff with a specific responsibility for site management are in place in both countries,

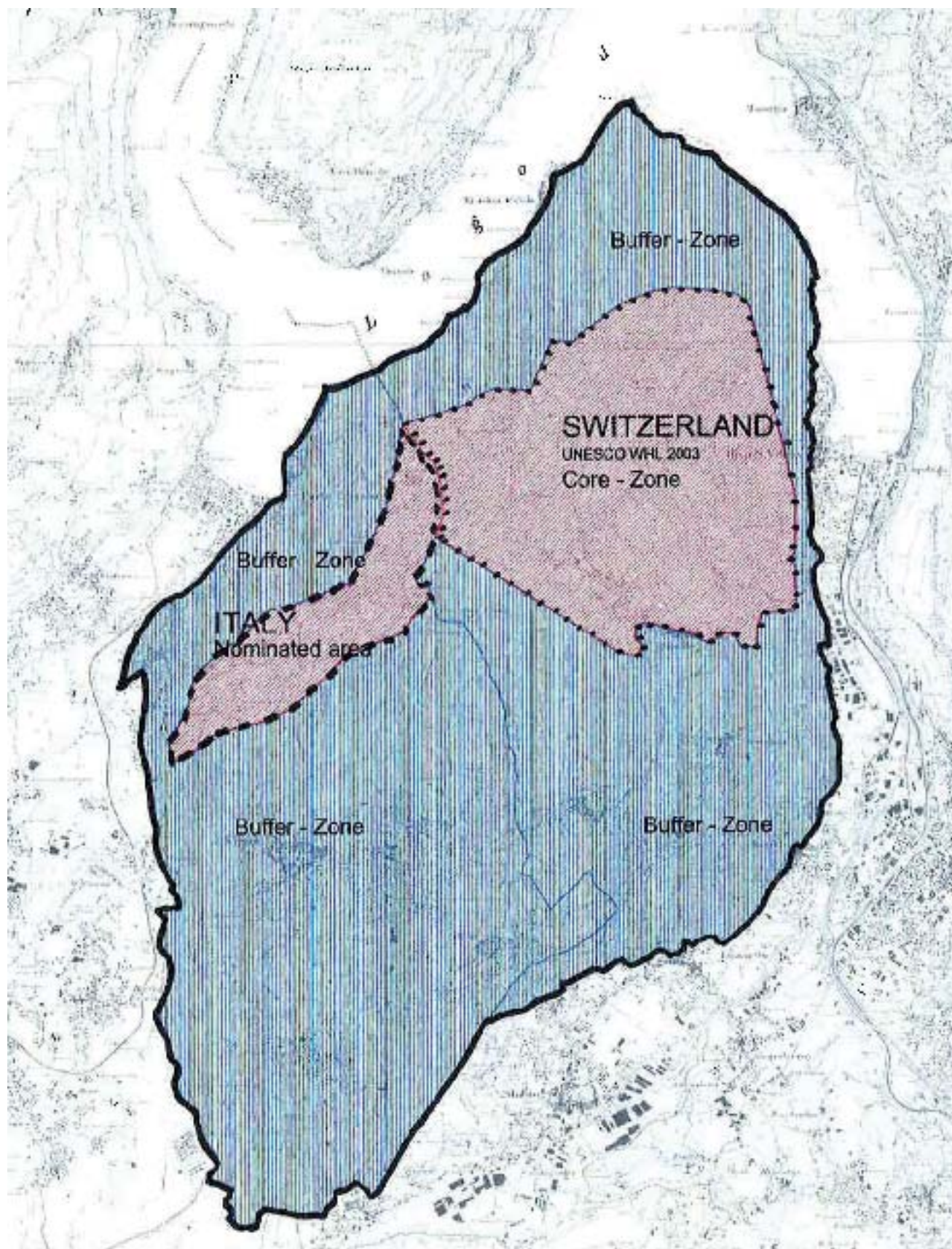
and collaborate effectively to ensure a fully coordinated management of the property, including in relation to its presentation.

The main management requirement in relation to the values of Monte San Giorgio is the *in situ* protection of fossil bearing areas. Although these areas are generally difficult to access, it is important to ensure their accessibility for managed legal scientific excavation. Continued scientific excavation is a key requirement to maintaining the values of this property as a world reference area for palaeontological research.

Maintenance of the relationships between the property and leading research institutes is also essential to both its scientific value and its presentation. Because the *in situ* fossil resources both require excavation and preparation to be of scientific value, and are not publicly accessible or visible, the completeness, presentation and safety of the fossil collections held in a limited number of universities and museums is key to the protection of the values of the property. These collections are maintained through strict adherence to appropriate legislative controls on excavation within the property. The housing of resultant fossil finds, and the standards of curation, specimen preparation and research, and museum display are of the highest quality in the main research collections related to the property. This presentation of the fossil finds from the property in major international museums also needs to be complemented by the appropriate provision of visitor centres and services within or near to the property, and a programme to establish and maintain these services is in place. An active ongoing programme of communication and interpretation for visitors to the property is required to ensure the fullest appreciation of the Outstanding Universal Value of Monte San Giorgio.

4. Welcomes the commitment by the State Party of Italy to complete the establishment of a national foundation for the Italian portion of the property, to ensure the appointment of the agreed position of World Heritage Site manager, and to provide sufficient funding for the management of the Italian portion of the property, and requests the State Party to implement and sustain these commitments as soon as possible;

5. Welcomes the collaboration between the States Parties of Italy and Switzerland to ensure effective transboundary management of the property, including the establishment of a 'Strategic Transnational Board', and requests the States Parties to ensure that the Board functions effectively and is provided with adequate resources for its work;
6. Requests the States Parties to ensure a single, coherent identity and consistent management approach for the transboundary property created by the extension, and to enhance programmes of presentation, interpretation and monitoring, maintenance of important rock exposures, and enhanced coordination of science and research;
7. Takes note of the anticipated minor changes to the boundaries of the property and its buffer zone in Switzerland, in order to ensure the best possible overall configuration of the property, and encourages the State Party of Switzerland to bring forward a boundary modification proposal;
8. Requests the States Parties to submit to the World Heritage Centre by 1st February 2013 a joint report on the State of Conservation of the property, including the establishment and operation of the Transnational Board, the provision of ongoing site manager positions, and the implementation of effective and adequately resourced management and presentation of the property, for consideration by the World Heritage Committee at its 37th Session in 2013.

Map 1: Location and boundaries of the nominated property

A. Natural Properties

A4 Boundary Modifications of Natural Properties

ASIA / PACIFIC

THREE PARALLEL RIVERS OF YUNNAN PROTECTED AREAS

CHINA



THREE PARALLEL RIVERS OF YUNNAN PROTECTED AREAS (CHINA) - ID N° 1083

1. BACKGROUND INFORMATION

The Three Parallel Rivers of Yunnan Protected Areas is a large natural serial property (1.7million hectares, 25 component parts), consisting of 15 protected areas which are grouped into 8 clusters. The property was inscribed on the World Heritage List at the 27th Session of the World Heritage Committee (Paris, 2003) under all four natural criteria. The inscription was recommended by IUCN, alongside a number of recommendations for further action that were also conveyed in the World Heritage Committee's decision.

The boundaries of the property have been a subject of discussion since the time of its inscription. In its evaluation of the original nomination IUCN welcomed that work was being considered on corridors, and that continuing inventory and research was leading to identification of additional areas that merit protection to more fully provide coverage to the range of natural values found in the region. The Committee decision (27COM 8C.4) encouraged "the continued refinement of the boundaries of the property, including the addition of other areas of equally high natural value, expansion of core zones and discussion of transboundary issues with neighbouring jurisdictions." The property was discussed at the 28th and 29th sessions of the Committee, mainly in relation to issues related to planned dam building in the region, and a mission to the property was requested.

At its 30th Session (2006) the World Heritage Committee considered the findings of the mission. Amongst these were concerns regarding boundaries. The mission found that the boundaries of the property were confusing and also reported that significant changes were proposed for a number of the components of the property, which the mission report stated would result in a 20% reduction of the original inscribed property. The mission noted that "When asked to explain the proposed changes, the response was that the 2003 inscriptions were of remote areas and actual boundaries were not fully demarcated". The mission also noted the development of mines and hydropower. The mission found that the actual boundaries of the WHS were confusing, and also reported confusion regarding the status of the boundaries of the inscribed property and the buffer zones. The mission concluded that the property "seems to have been inscribed before the State Party had fully defined what was to be included and what regimes were to be applied to the protection of the sites. By a letter received by the

World Heritage Centre on 7 July 2006 in response to the report of the mission, the Chinese authorities had stressed that no modification of the boundaries of the property had been approved or even officially proposed, and that no mining operations had been or would be allowed in the future within the property. The Committee noted with grave concern the findings of the mission in relation to proposed changes to the boundaries of the property which could significantly alter the values for which the property was inscribed, and mining operations within the property which threaten its integrity and values. It requested further information from the State Party on these and a range of other matters related to the property.

The State Party provided further information on boundary modifications to the 31st Session of the Committee (2007). The World Heritage Committee requested "the State Party to amend the boundaries of the property to exclude major cleared encroachments and to add critical habitats for conservation, ensuring the establishment of linkage between different parts of the property via biological corridors or other options for ecological connectivity, and to submit all proposals for boundary changes for consideration by the Committee in line with paragraph 165 of the Operational Guidelines" (see decision 31COM 7B.15). At its 32nd Session (2008), the Committee commended the State Party on consultations being undertaken with stakeholders on the modification of the boundaries of the property, and requested a detailed report [inter alia] on the boundary modification, for examination by the World Heritage Committee at its 34th session in 2010 (see decision 32COM 7B.11).

A proposal for a boundary modification following the above requests was submitted to the World Heritage Centre and transmitted to IUCN for review on 1st September 2009. IUCN was invited by the China Association of National Parks and Scenic Spots to visit the area, and was able to see firsthand some of the proposals under discussion and also meet a number of officials, community and business representatives and technical experts, including NGO experts, who had been involved in the discussion of the nomination (although in a very short visit an entire review of the area was not possible). This visit was able to visit first hand some of the areas where mining activities are in conflict with the World Heritage property (see below).

On 16th October 2009 IUCN transmitted, through the World Heritage Centre, a request for supplementary

information on the boundary modification, including a range of questions regarding the maps, boundaries, justification for amendments and supporting documentation discussed during the above mission. A substantial document and new maps were provided by the State Party in response on these matters and were received by IUCN in early December 2009, in time for initial consideration but not full review by the IUCN World Heritage Panel. Following the IUCN Panel meeting one further point of clarification was requested of the State Party, and a response was received in mid-March 2010. All of the above documentation was also officially submitted to the World Heritage Centre.

2. BRIEF SUMMARY OF PROPOSAL

The boundary modification submitted comprises amendments to all of the eight “clusters” of component parts within the property either by modifications to the boundaries of the inscribed areas (termed “core areas” in the submission), or by revisions to buffer zones including the identification of habitat connectivity corridors between the different component parts of the property. Summary maps showing the boundaries as submitted and as amended are shown in Maps 1 and 2, however the original documentation should be used as the definitive record due to the large size of the area and the complexity of the property and the changes proposed.

Overall the proposed revisions marginally increase the size of the property (by 1.7%) and also of its buffer zone (by 1.9%). In addition the review identifies three existing nature reserves to be recognized as ‘Influencing Areas’ for the property. A new category of buffer zone is defined as ‘genetic corridors’ to emphasise the importance of protecting habitat integrity and connectivity to help maintain biological gene flow between isolated sub-units and core zones.

In addition, the State Party has remeasured the areas of the components of the property and the buffer zones, and the proposals as revised. These remain based on the organization of the property in 8 “Sub-units”, each being a cluster of component parts with a common buffer zone. Although this is not the preferred format for submission of serial nominations, the original terminology (of sub-units) has been retained in the text below for clarity of discussion. The remeasured figures for both the original and proposed extent of the property are also used as these are understood to represent the

reality of the scale of changes proposed. The table of areas as originally reported, as remeasured and as proposed by the modification are included in this report. There were some discrepancies between the measurements quoted in different stages of the State Party submissions: the figures quoted are from the supplementary information. Some of the differences between the quoted original and remeasured figures are very large, representing errors of up to c.50% but the degree of discrepancy is also not consistent. It has not been possible to fully ground the reasons for the differences, but IUCN has considered the most recent figures, which have been endorsed by NGO partners as the most accurate estimates within the discussion below.

In summary the changes to each of the eight “clusters” is as follows.

1. Gaoligongshan Sub-unit (3 component parts as revised): The inscribed components remain unchanged in the proposal as three isolated core areas comprising the three sections of Gaoligong Nature Reserve. Two modifications to the buffer zone are made that are considered to enhance its integrity, one extends a buffer zone and wildlife corridor to the south down the Nu River, while the other refines boundaries based on better mapping of important forest areas. There is no change in the inscribed area of the components in this sub-unit (344,386.5 ha)¹, and an increase in the area of the buffer zone from 173,135.10 ha² to 231,910.30 ha.

2. Baima-Meili Xueshan Sub-unit (4 component parts as revised): No changes are proposed to the extent of the inscribed property. However the buffer zone is increased to a total area of 165,342 ha³, equivalent to 3.95% of the original sub-unit area and includes 128,418 ha of newly defined genetic corridors. These changes result in a new connection between the two buffer zones of the Baima-Meili Xueshan, and the buffer zone of the Gaoligongshan Sub-unit.

3. Laowo Sub-unit (2 component parts as revised): The inscribed area of this small sub-unit of the property remains unchanged (17,394.60 ha)⁴ but the buffer zone is marginally extended southwards so as to include the highest peak in this sector of the Biluo mountain chain and including part of the western slopes of the crest within the Nujiang catchment, which were not represented in the original reserve. These changes give the unit a greater altitudinal range and reflect the fact that the Biluo Mountains have been listed as one of China’s

1. Measured at 305,306.1 ha at the time of the nomination

2. Measured at 208,176.3 ha at the time of the nomination

3. Measured at 267,507.8 ha at the time of the nomination, and remeasured at 230,642.1 ha

4. Measured at 17,426.1 ha at the time of the nomination

Important Bird Areas (IBA) by Birdlife International. The increased buffer zone is 44,642 ha⁵ in area .

4. Yunlingshan Sub-unit (1 component part as revised): The inscribed boundaries of the Yunlingshan Nature Reserve are not ideal due to a very high border to area ratio and a straggling long shape comprising three small cores linked by very narrow connections. The Yunnan Snub-nosed Monkey *Rhinopithecus bieti* was a principal focus for conservation in this component, as well as an indicator of ecosystem health. The northern sector of the component is stated to have been already heavily disturbed by human activities at the time of inscription, including formerly logged areas and crossed by roads. No Yunnan Snub-nosed monkeys occur in the northern sector having withdrawn to the better forests in the central part of the reserve. The State Party proposed as a modification a redesigned reserve to consolidate protection of the remaining good habitat and to also extend the reserve eastwards to the next sub-range of hills, thus bringing the borders closer to Laojunshan Sub-unit and allowing the possibility of some genetic exchange with that protected area. The State Party note that the original Yunlingshan boundary was a proposed Nature Reserve but was never legally gazetted. The proposed revised boundary matches a fully gazetted Nature Reserve, which has been shaped on the basis of more detailed and up to date knowledge of the distribution of the Yunnan Snub-nosed Monkeys following 20 years of study by scientists of Kunming Institute of Zoology, and evidenced by a detailed distribution map for the species. The new sub-unit is reduced in area from 31,124.7 ha⁶ to 27,907.0 ha (a decrease of c.10%), and is stated to have a 60% overlap with the original sub-unit. The buffer zone for the revised area is reduced from 60,331.3 ha⁷ to 50,552.9 ha

5. Laojunshan Sub-unit (2 component parts as revised): Since inscription as part of the WH site, Laojunshan has undergone considerable survey, and planning by staff of Yunnan Forestry Bureau, the European Community Biodiversity Programme in China and the US-based NGO, The Nature Conservancy (TNC). The unit has been gazetted as a full Nature Reserve. A management plan has been drawn up for its protection and approved by Yunnan provincial government. These developments lead the State Party to propose changes and an overall extension of the boundaries of the World Heritage property. The inscribed areas have been linked, buffer zones extended and two small heavily occupied residential zones excluded. In total a reported 22,693.6 ha are proposed to be

added and 6,756 ha excluded from the original inscribed areas, as per the original submission. The supplementary information provided reports a net increase in area from a reported 43,388.2 ha⁸ to 59,325.8 ha in the inscribed components within this sub-unit. The area of the buffer zone is increased from 68903.5 ha⁹ to 72,923.8 ha.

The impacts of the changes are considered to be highly positive in the submission, which states that they result in greater inclusion of Danxia rock formations especially the turtle erosion patterns of the Buddha head peaks and protection of biodiversity and threatened species (especially Yunnan Snub-nosed Monkey). All these values are stated to be better protected under the refined boundaries by including all geological and scenic sites of the unit and all occupied habitat of the monkeys. By extending the buffer marginally both northwards into the Jinsha valley and westwards into the Lancang valley, the range of biological communities included in the sub-unit is increased and the degree of isolation from the Yunlingshan sub-unit from other sub-units of the property is reduced to 5 km.

6. Hongshan (Red Mountain) Unit (2 component parts as revised): The State Party submission reports that southern sectors of the unit are both degraded and are also a permanent management problem and cause of conflict with local people who hold ownership of most of the land under customary laws of the province and have requested that their lands remain outside of the World Heritage property. It appears these views were not considered at the time of inscription. This sector of the unit is also stated to have been degraded by logging prior to the introduction of a national logging ban, and the State Party reports it is heavily grazed in summer by yaks, horses and cows. It is also extensively used for collection of traditional medicines and home to several small villages and is crossed by two major roads leading via the large township of Gezan over the mountains to Sichuan.

It is more evidently damaged by a long history of mineral mining. Although many small illegal mines are reported to have been closed, the State Party has found it impossible to gain agreement of local communities for further termination of their economic activities, relocation or restoration of habitat to a natural condition. This is notably the case in relation to a number of extant, legal mines that predated the nomination of the property but were not mentioned in the nomination or other subsequent reports, were not included in the itinerary for the IUCN evaluation mission, and were

5. Measured at 31,735 ha at the time of the nomination, and remeasured at 25,603.1 ha

6. Measured at 31,346.1 ha at the time of the nomination

7. Measured at 58,441 ha at the time of the nomination

8. Measured at 44,265.7 ha at the time of the nomination

9. Measured at 87,161 ha at the time of the nomination

not detected by the evaluation process by IUCN at the time of consideration. Mining exploration licenses remain active and mining development licenses have been granted for a few rich copper deposits identified within the sector. The proposed amendment of the boundary primarily has the effect of the excision of land that is included in legal licensed mining exploration and production areas. This amounts to a loss of a stated c.22,000 ha of the inscribed components of Hongshan (according to the original State Party submission), amounting to a change from 164,823 ha¹⁰ to 142,604.7 ha (a reduction of 13% in area). This involves the removal of one of the component parts of the property, and the reduction of a second, plus the reassignment of the southern component. The revision also involves a large reduction of the buffer zone of Hongshan from 260,864.8 ha¹¹ to 144,604.6 ha. There are related additions made to the Haba Snow Mountain sub-unit which are described below, which include “moving” one component to this sub-unit of the property. 668.0 ha of genetic corridors are also delineated within the Hongshan buffer zone to strengthen connectivity between its remaining component parts, and the two most northerly core zones have would be linked together.

7. Haba Snow Mountains Sub-unit (3 component parts as revised): This unit is proposed to be enlarged through extension to join the southernmost components of what was formerly the Hongshan sub-unit, after the exclusion of degraded areas (see above), and buffer zone areas are increased through both addition of some of the former buffer zone of the Hongshan sub-unit, as well as an additional area connecting to the former northern boundary of the Haba Snow Mountains Sub-unit. The area of the inscribed property would therefore increase from 59,561.8 ha¹² to 79,689.0 ha through the proposal. The buffer zone of this sub-unit would be increased from 37,414.0 ha¹³ to 77,080.7 ha. The State Party proposal states that in addition to increasing the area, the proposals increase the biotic range and degree of connectivity within this sub-unit.

8. Qianhushan Sub-unit (1 component part as revised): The sub-unit has very few amendments within the proposed modification. The buffer zone has been minimally realigned to include forest and exclude open village lands at the periphery. The area of the inscribed property remains unaltered at 38,905.9 ha¹⁴ and the buffer remains 29,355.9 ha¹⁵. The minor realignments of the buffer increase forest inclusion and reduce residential and farmed area.

9. Influencing Areas: In addition to the above amendments the State Party also proposed to recognize three areas that are not connected geographically to the inscribed property (comprising a total of 89,830 ha of land) as “influencing areas”. These areas would be formally recognised as analogous to buffer zones to the World Heritage property, which whilst not adjacent to the inscribed property nevertheless play an important role in enhancing the unique values of the site, the State party wishes to register three such influencing areas as important for the value of Three Parallel Rivers of Yunnan Nature Reserves. These are:

- **Napahai Lake** (3,532 ha): This lake and wetland was included in the initial nomination document but dropped on the advice of the original IUCN review team on the basis that the site was small and isolated from other mountain sub-unit. The State Party emphasizes that the Napahai Lake is the largest lake within the Three Parallel Rivers area and the most important for wintering rare waterfowl especially Black-necked cranes *Grus nigricollis*. The site has been listed by Birdlife International as an Important Bird Area (IBA).
- **Yulong Snow Mountain** (26,440 ha): This area is a nature reserve, containing mountain and forest habitats. It is a sacred mountain for the Naxi minority who claim communal rights under provincial law. The site has been partially developed for tourism including a golf course, an outdoor theatre and construction of a cable car to the edge of the main glacier. It was considered too disturbed to be added to the property as was proposed in the original IUCN evaluation in 2002. Yulong Snow Mountain however for the most part is in a natural condition and is important as the partner peak to Haba Snow Mountain on opposite sides of the “Tiger Leaping Gorge”. It also provides a scenic background of the World Heritage cultural property of Old Lijiang town. The site also has important biodiversity value and has been listed as an Important Bird Area (IBA) by Birdlife International.
- **Cangshan** (58,857.4 ha): This nature reserve protects important forested mountains to the west side of Erhai lake close to the town of Dali, and is a tourism destination for Yunnan province. The reserve is one of the

10. Measured at 205,603.8 ha at the time of the nomination, the reduction in area would be 31% based on this figure

11. Measured at 159,083.6 ha at the time of the nomination

12. Measured at 28,356.7 ha at the time of the nomination

13. Measured at 73,419.1 ha at the time of the nomination

14. Measured at 39,629.6 ha at the time of the nomination

15. Measured at 58,910.4 ha at the time of the nomination

biologically richest sites in the Hengduan mountain biodiversity hotspot. In relation to the conservation of the existing property, Cangshan forms an important stopover point for populations of many passerine birds that nest in the high mountains of Three Parallel Rivers before migrating to tropical and subtropical habitats during the winter months. It is also anticipated that this area will be important to the capacity of the southern parts of the property to adapt to predicted climate change.

The State Party considers that the revisions meet the requirements placed upon the State Party to exclude major cleared encroachments, add additional important natural areas and better link isolated units of the property in previous Committee decisions. It suggests that they will reduce management conflicts, increase the 'naturalness' of the property, strengthen its ecological integrity and provide greater adaptability and resilience in the face of predicted climate change. The State Party notes that it considers the modifications should be regarded as a minor boundary modification given the small percentile change in size of the property, relative to the huge size of the entire property. The proposal states that no scenic areas, geological features or biological communities would be lost that are not adequately represented within the refined boundaries and that most of the changes relate to the buffer zone.

The first submission of supplementary information provided includes detailed information on a number of aspects of the proposal including high quality mapping, information related to values included vegetation maps, key species maps, and maps of geological phenomena, detailed information on mining licenses affecting the property, and information concerning the legal protection and management arrangements for the property. A second request for supplementary information provides further elaboration on the mining licenses affecting the property.

3. IMPLICATIONS FOR OUTSTANDING UNIVERSAL VALUE

IUCN has considered the proposed boundary modifications with great care, in view of the long history of the consideration of this property by the Committee, and the range of decisions that have been taken related to requests for boundary amendments. IUCN's evaluation has also considered expert input from both the original evaluation team and a number of people with senior experience in relation to conservation in China.

In relation to the overall proposal, IUCN notes that some of the changes involve rather significant

modifications to the boundaries of the property. In principle these are of the scale that might equally well be considered as an extension of the property. Whilst IUCN takes note of the past decisions of the Committee that seem to imply the invitation of a minor modification to the property, IUCN also notes that a very significant amount of background work has gone into the proposals involving the input of leading experts and NGOs. IUCN considers that it would have been preferable that the State Party would have put forward the proposals as a formal extension, allowing a longer period of consultation and evaluation, and an official mission to review the proposals.

IUCN considers that the boundary proposals appear to have clear positive, or neutral aspects for four of the sub units of the property. The changes proposed to the Gaoligongshan, Baima-Meili Xueshan, Laowo and Qianhushan sub-units all appear to result in either no change or in improvements to the configuration of the property and its buffer zones. The addition of buffer zones that connect the Gaoligongshan and Baima-Meili sections of the property, and the definition of wildlife corridors within many of the buffer zones is also welcome.

The changes to four of the other units is more significant and require discussion. IUCN's evaluation of these proposals is as follows.

a) **Yunglingshan sub-unit.** The proposal results in a substantial reconfiguration of the components of this Sub-unit. It leads to a decrease in its area, but also a reconfiguration to better reflect the distribution of key habitats and species. The work of TNC in both mapping habitats and the distribution of the Yunnan snub-nose monkey is cited as supporting evidence of the reconfiguration. The proposed amendments are strongly supported by leading experts. The State Party also indicates the revised area proposed as the sub-unit is a legally protected area with a specific management unit, whereas the property as currently configured is only partly protected. Based on the information provided by the State Party and experts, IUCN concludes that this amendment appears to retain existing values of the property, but be better configured to the best available evidence of the ecological values of the area (as per recent studies by TNC), and also to be tied to a clear legally defined protected areas. The proposals therefore appear to have a positive effect in relation to the integrity of the property as it stands, despite the reduction in overall area, although the edge to area ratio is still high the resulting component is a single area rather than separated components. IUCN notes the assurance of the State Party of the implementation of effective and strengthened protection and management on its revised boundaries, including protection of both the natural habitat within it, and the populations

of key species including the Yunnan snub-nose monkey that lie within it.

IUCN considers this amendment to this sub-unit should be approved as a minor modification to the boundaries of the property.

b) **Laojunshan.** The changes to this component of the property appear to be positive overall, in adding significant areas of land of biodiversity importance to the property and connecting previously separate components. The supplementary information provided by the State Party demonstrates that the main geographical/geological features of this sub-unit remain included within its revised boundaries, justified by the distribution map of Danxia landforms. TNC's information also demonstrates the improvement of the boundaries in relation to key habitats and species.

IUCN considers this amendment to this sub-unit should be approved as a minor modification to the boundaries of the property.

c) **Hongshan and Haba Snow Mountain.** The changes related to these components are related to each other, and land is "transferred" between the two sub-units. These changes are therefore discussed together. Overall the cumulative changes in these two components result in a small decrease in overall area of inscribed property (the total inscribed areas of both properties before inscription is 224,384 ha, and afterwards would be 222,293 ha) but a large change in the area of the buffer zone (total before 298,278 ha and afterwards 221,684 ha). In principle IUCN notes that the World Heritage Committee has, in the past, not accepted such changes to buffer zones to be made through the minor boundary modification process.

The State Party argues that the overall impacts on the Outstanding Universal Value of the property may be regarded as minimal. The submission suggests that the remaining area is still sufficient to protect the full range of the geological formations exhibited and all the most scenic areas and the full range of biological communities. The State Party suggests that due to the less steep nature of the geography, this open area is the most heavily grazed portion of the property and that this area has been affected by a long history of artisanal and illegal mining.

The changes proposed in these sub units are the most problematic within the proposal, notably because the area is subject to both legal active mining and legal mining exploration within both the inscribed property and the buffer zone of the Hongshan Unit. The State Party provides information on five legal operating licenses that were granted between 1995-2000. 19 mining exploration licenses also affect the property and were granted between 1998-2000 which are understood to include areas

currently being considered for additional mining. Map 3 shows the configuration of the current and proposed revised boundaries of these components, relative to relatively small areas of active mining production and large areas licensed for exploration. It can be seen that the effect of the change is to exclude the mining areas from the property.

The IUCN visit was also able to review the mining impact in the field and also met with one of the private sector operators and representatives of the local community. The visit confirmed the existence of a series of mines within the current boundary of the property. These include both open-cast and underground operations, and a significant mineral processing infrastructure including a series of processing plants, and banded settlement areas. IUCN was concerned to note that some of the mineral processing was taking place in the watercourse, with no separation between the water used for mining and the natural flow of water. This represents a permanent impact on the natural system, and also could present risks in relation to downstream communities. IUCN is not in a position to review this information in depth but considers that the State Party should urgently implement more appropriate standards of environmental control and management of mining, meeting internationally accepted standards of best practice.

The conflict between the legal mining and the creation of the World Heritage property is also reflected in a strong community objection to the World Heritage property. Community representatives stressed during the IUCN visit that they had not been consulted on the inclusion of their land in the property, and that they are opposed to this. A petition requesting the removal of their land from the World Heritage property was also presented in the supplementary information by the State Party.

The highly problematic situation is that legally licensed mining production clearly predates both the inscription of the property, and the establishment of effective protected areas on which it can be based. The State Party makes it clear that at the time of nomination, the responsible authorities were not aware of the mining activities, although knowledge of illegal mining existed. IUCN's evaluation was not shown the mining areas, or made aware of the mining, and neither did it detect these areas through its review network at the time of inscription. The 2006 monitoring mission to the property heard about the mining issue but did not visit the area. In its current and earlier reports on the property the State Party referred to the issue and informed of the closure of 146 illegal mines, but did not note the ongoing presence of legal mining production and exploration. The State Party makes it clear in its submission that there has been no issuing of any new mining license since the inscription of the property on the World Heritage List, and that

it “can guarantee that no further mining licenses are granted in other sectors of the World Heritage property or buffers”.

IUCN recognizes that the corollary of the Committee’s position on the incompatibility with mining and World Heritage properties, is that World Heritage properties should not be created in areas where there is existing, ongoing mining. In line with the provisions of the Operational Guidelines, the situation should not have arisen where such areas had been nominated by the State Party, and if they had been detected during the evaluation they could not have been recommended for inscription by IUCN. They were inscribed by the World Heritage Committee without the knowledge of the presence and extent of mining areas. However as the property is inscribed on the basis of all of its components, and consistent with the past decisions of the Committee, there is not a possibility to accept that such a modification can be accommodated through the minor boundary modification process. IUCN notes that the Operational Guidelines contain at paragraph 165 details of the procedure to be followed, which would also allow an official World Heritage evaluation mission to visit the property and consider matters in the field.

IUCN considers that the amendments to the Hongshan and Haba Snow Mountain sub-units of the property should not be accepted as a minor modification to the boundaries of the property.

d) **Influencing Areas:** IUCN considers that the proposed addition of three zones as influencing areas to the property is an interesting proposal, that appears to be motivated by both a concern for the ability of these areas to help to protect the values of the property, and because of the values of these areas in their own right. They include one area noted by IUCN for possible consideration at the time of inscription of the property on the World Heritage List (Yulong Snow Mountain), whilst the other areas show some linked importance to the property. The areas appear to have adequate legal and management capacity, and in the overall context of the property would not add unduly to the already complex management arrangements. However IUCN notes that the term “influencing areas”, whilst proposed by an expert meeting on buffer zones, has not been adopted into the Operational Guidelines, IUCN is also concerned that the supplementary information regarding these suggested buffer zone additions is framed in terms of a nomination and refers to the “Outstanding Universal Value” of these areas. IUCN considers that the status of these areas would not be clear if they were adopted at this stage, and recommends that they are either reconsidered as additional extensions to the property, or as buffer zones.

IUCN considers that the amendments inscription of three “influencing areas” to the property should not be accepted as a minor modification to the boundaries of the property.

Connectivity conservation

A welcome innovation in the proposals, taking into account IUCN’s earlier recommendation is the increase in connectivity both within and between components, and increases in buffer zone areas that are envisaged in most cases. Overall the revisions add natural areas to the property that increase the range of biological communities protected, including representation of communities on both sides of each major valley. Revised boundaries of some components better reflect the distribution of key threatened species.

Extended buffer zones reflect the identification of new sites of biological significance, in particular revealed by the publication of maps and descriptions of Important Bird Areas (IBAs) by Birdlife International and regions of high biodiversity significance revealed by the TNC project ‘China Blueprint Project’ which has identified priority areas for conservation in the Upper Yangtze Catchment.

Effective management of the property

The information provided by the State Party demonstrates that the past decisions of the Committee have been interpreted as a reason to delay the formal recognition of the boundaries of the World Heritage property under Chinese Law. NGO submissions are extremely concerned about this issue as well, considering that it is impacting on the ability to impact effective conservation management. The submission of the State Party notes that a number of the sub-units await confirmation and final approval of boundaries to precede management planning and the allocation of additional resources and staff. A table provided in the supplementary information indicates that 5 of the 9 management plans related to the property are finished but awaiting adoption of the boundary modification. Only two sub-units (Baima-Meili and Laojunshan) have completed plans, and two (Hongshan and Yunlingshan) have plans still under development. The same table indicates provision is made for more than double the number of staff in the property (an increase of 828 to 1873) assuming the boundary modifications are confirmed. IUCN considers that the proposed increases in staffing and recognition is to be welcomed, but notes that it is of concern that the State Party has not already put in place required management planning and staffing, pending issues of the fully resolved boundaries. IUCN urges the State Party to establish, at the earliest opportunity, approved management plans and adequate resources for the property.

4. OTHER COMMENTS

IUCN notes the inscription of a natural property with, inadvertently, the inclusion of areas of active mining as an unfortunate decision which is not in line with the Operational Guidelines to the Convention, nor the policy of the World Heritage Committee in relation to mining and World Heritage. This issue provides a number of general lessons, especially regarding large and complex serial nominations. The most obvious of these is the importance of States Parties fully consulting with all interests and to carry out thorough research on nominated areas, and especially those where properties are large, remote and not well researched. Consultations with other ministries that may not integrate their activities with protected areas, and with industry and communities is highly important in the preparation of nominations. The issue emphasizes the importance of gaining clear assurances from States Parties regarding conflicting land uses, especially where properties are too large for every part to be visited during an evaluation mission. The issue also points to the possible utility of remote sensing techniques in reviewing areas that are remote and cannot be seen on the ground. These issues are far more likely to occur in large properties, and large serial properties and thus the World Heritage Committee should also be particularly careful in reviewing the integrity, protection and management of such nominations.

5. RECOMMENDATION

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

The World Heritage Committee,

1. Having examined Documents **WHC-10/34.COM/8B** and **WHC-10/34.COM/INF 8B2**,
2. Approves as minor modifications the changes proposed by the State Party within the areas referred to as the Gaoigongshan, Baima-Meili Snow Mountains, Laowo Mountain, Yunling Mountain, Laojun Mountain and Qianhu Mountain sub-units of the property;
3. Does not approve as minor modifications the proposed amendments to the Haba Snow Mountain and Hongshan Mountain, in view of the potentially significant nature of these proposals in relation to the integrity of the property, and also does not approve the addition of three proposed “influencing areas” to the property;

4. Welcomes the commitment of the State Party to increase the staff and resources for the property and to complete, approve and implement all of the management plans for the property and urges the State Party to implement these commitments at the earliest opportunity within all of the sub-units where minor modifications are approved and the boundaries are fully clarified, and to also establish without delay effective protection and management for all components and buffer zones of the property, and to reinforce the overall management of the property;
5. Notes with regret the apparent inadvertent inscription of legal mining areas that were operational prior to the nomination, in the inscribed property, and reiterates that active mining is not compatible with World Heritage Site status. The Committee further reminds States Parties to ensure that mining areas are not nominated inappropriately to the World Heritage List, and requests IUCN to give particular consideration to possible mining conflicts in relation to its evaluation and monitoring processes;
6. Requests the State Party to propose amendments to the Hongshan and Haba Snow Mountain components of the property, to be considered through the process foreseen for significant modifications to the boundaries of a World Heritage property, as set out in paragraph 165 of the Operational Guidelines. The Committee notes that this process would allow an official IUCN mission to consider this matter and advise the Committee upon the proposal. The Committee further notes that this significant modification, if submitted, should consider the basis for exclusion of the existing legal mining production areas that have been under operations before the inscription of the property and that could not have been considered to be of Outstanding Universal Value at that time. The Committee also notes that the significant modification should indicate the impacts that it would have on the Outstanding Universal Value of the property at the time of inscription of the property on the World Heritage List in 2003, and also considering the approved modifications to the other sub-units of the property referred to in paragraph 2 of this decision that enhance the integrity, protection and management of a number of the components of the property;

7. Further considers that, unless they are clearly demonstrated to not contribute to Outstanding Universal Value of the property, the areas currently subject to mining exploration licenses in the Hongshan component of the property should be considered for retention in the property, and also considers that the commitment to not mine in World Heritage Sites applies to these areas. The Committee therefore requests the State Party to not permit the conversion of mining exploration licenses to production licenses in these areas, as this would clearly be counter to the Committee policy position to not mine in World Heritage properties;
8. Requests the State Party to take all necessary steps to ensure that the mining operations that have already become established within this sector of the property and its buffer zone conform to appropriate international standards regarding the risk to the environment including human health;
9. Recommends the State Party to consider the renomination of the proposed influencing areas as either extensions to the property, or to include them within extended buffer zones that are contiguous with the property;
10. Requests the World Heritage Centre and IUCN, in collaboration with the State Party, to expedite the agreement of a Statement of Outstanding Universal Value for the property, based on the draft submitted by the State Party, for approval by the World Heritage Committee at its 35th Session in 2011;
11. Further requests the State Party to also take note of the above recommendations in relation to any requested actions decided by the World Heritage Committee in relation to the State of Conservation of the existing property.

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Map 3: Map of Hongshan Sub-unit, the mining and mineral exploration sites currently within it.

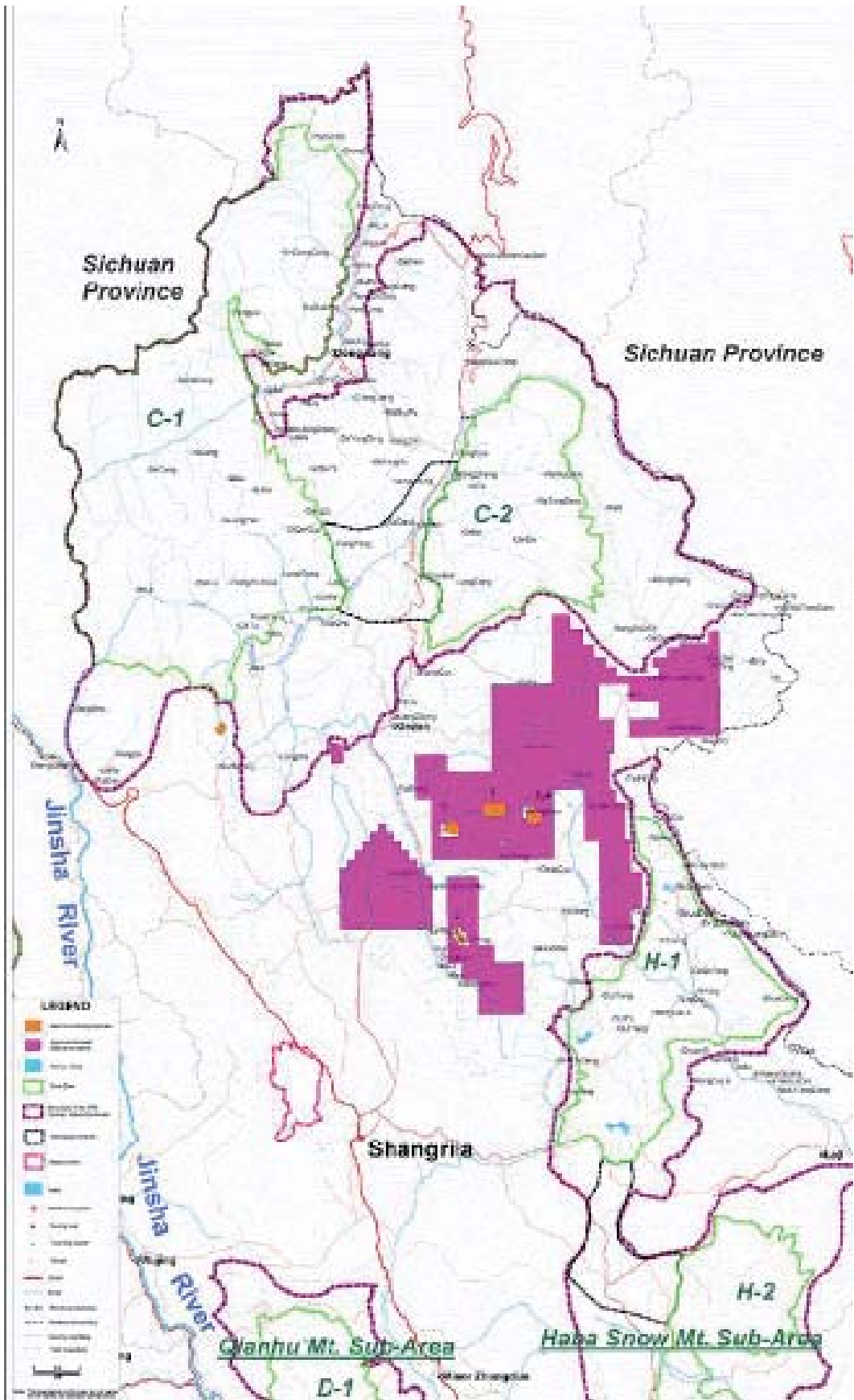


Table 1: Size measurements of the sub-units of the property as currently inscribed (original and remeasured figures) and in proposed boundary modification

Name (Cluster of components)	Listed inscribed	Remeasured inscribed	Refined inscribed	Listed buffer	Remeasured buffer	Total buffer
1. Gaoigongshan	305,306.1	344,386.5	344,386.5	208,176.3	173,135.1	231,910.3
2. Baima-Meili Snow Mountains	267,507.8	230,642.1	249,870.0	81,511.0	127,590.7	165,342.3
3. Laowo Mountain	17,426.1	17,394.6	17,394.6	31,735.0	25,603.1	44,642.0
4. Yunling Mountain	31,346.1	31,124.7	27,907.0	58,441.0	60,331.3	50,552.9
5. Laojun Mountain	44,265.7	43,388.2	59,325.8	87,161.0	68,903.5	72,923.8
6. Haba Snow Mountain	28,356.7	59,561.8	796,89.0	73419.1	37,414	77,080.7
7. Hongshan Mountain	205,603.8	164,823.8	142,604.7	159083.6	260,864.8	144,604.6
8. Qianhu Mountain	39,629.6	38,905.9	38,905.9	58910.4	29,355.9	29,355.9
TOTAL	939,441.9	930,227.6	960083.5	758,437.4	783,198.4	816,412.5
Influencing areas						
Napahai Lake						3,532.5
Yulong Snow Mountain						26,440.5
Cangshan						59,857.4
TOTAL						89,830.4

EUROPE / NORTH AMERICA

MESSEL PIT FOSSIL SITE

GERMANY



WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

MESSEL PIT FOSSIL SITE (GERMANY) - ID N° 720

1. BACKGROUND INFORMATION

Messel Pit Fossil Site is a former area of open cast quarrying for oil shale and is one of the smallest natural World Heritage properties, being 42 hectares in area. The property was inscribed on the World Heritage List in 1995, and is recognised under criterion (viii) in relation to its values for fossils produced from the former quarry area. The evaluation of the property at this time considered it to be of Outstanding Universal Value as the single best site which contributes to the understanding of the Eocene, a time when mammals became firmly established in all principal land ecosystems.

2. BRIEF SUMMARY OF PROPOSAL

The proposal is to create a buffer zone to the property, comprising an area of 22.5 hectares within the perimeter fence that surrounds the property. The buffer zone of the Messel Pit Fossil Site is clearly defined on its outer side by the fence, whilst its inner boundary adjoins that of the inscribed property.

3. IMPLICATIONS FOR OUTSTANDING UNIVERSAL VALUE

As it concerns the creation of a buffer zone, the proposal is considered in relation to the integrity, protection and management of the inscribed property.

The fenced area that comprises the buffer zone prevents illegal trespassing, illegal excavations and other damage that could occur to the inscribed property. The presence of the fence is marked on the 1994 map submitted in support of the nomination, and its presence and role is also noted in the IUCN evaluation report. The 2006 periodic report for Europe concluded that the fence has proven to be a highly effective measure of protection for the values of Messel Pit Fossil Site.

The site itself as well as the proposed buffer zone is under legal protection by the state law protecting historical and palaeontological monuments and sites: The Act on the Protection of Cultural Monuments (Monument Protection Act) of the Land of Hessen of 5th of September 1986. [Hessisches Gesetz zum Schutze der Kulturdenkmäler (Denkmalschutzgesetz) in der Fassung vom 5. September 1986]. The proposal was submitted as part of the submission of a new management plan for the property.

IUCN considers that this proposal is straightforward in recognising the narrow but important protected zone around the inscribed property that is already

the de facto buffer zone of the property, and was noted at the time of inscription. The proposal will support continued effective management of this area to provide security to the World Heritage property and assist in its long-term conservation by allowing regulation of access, including in relation to visitor safety considerations. There is also a possible benefit in relation to the protection of the wider geological strata that surround the property. The management plan, dated 1st November 2009, has been reviewed by IUCN and appears to provide a positive further step in the conservation and presentation of this property. The plan is comprehensive and describes the management activities and challenges. It will need to be complemented by specific action plans and adequate resources to ensure effective and ongoing implementation.

IUCN notes that the State Party's proposal states that one motivation for the creation of the buffer zone is that under the revised Operational Guidelines a buffer zone is "now required for world heritage sites". IUCN notes that a buffer is not a strict requirement if there are other means of effective protection in place to protect a property from wider threats. However, in this case the area is fully appropriate to be recognised as a buffer zone, considering the functions it performs. IUCN considers the proposal, combined with the equally important achievement of the newly prepared management plan, are to be welcomed.

IUCN considers that the proposal to create a buffer zone meets the requirements for approval as a minor boundary modification to the property.

4. OTHER COMMENTS

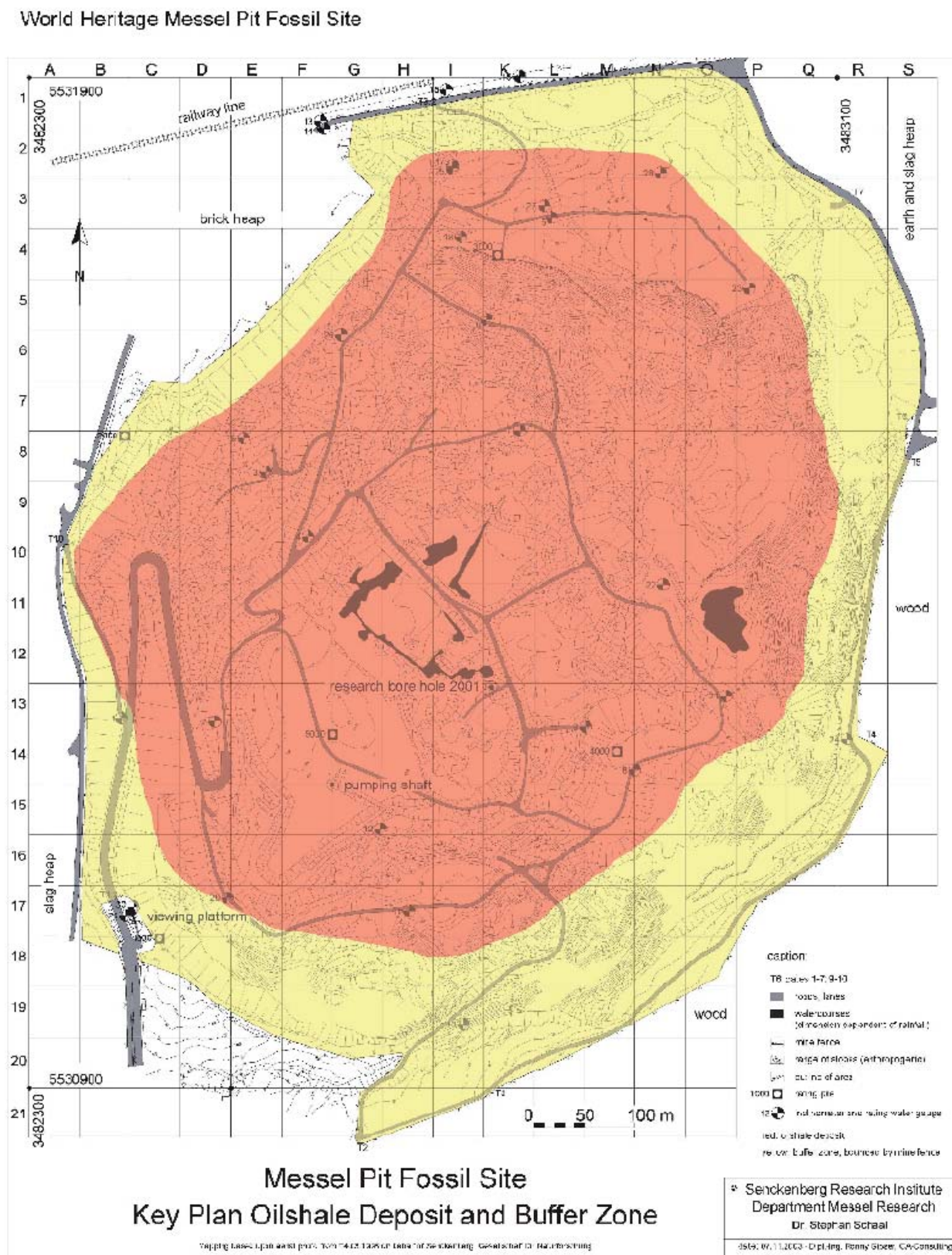
None.

5. RECOMMENDATION

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

The World Heritage Committee,

1. Having examined Documents **WHC-10/34.COM/8B** and **WHC-10/34.COM/INF 8B2**,
2. Approves the proposed creation of a 22.5 ha buffer zone for the 42 ha **Messel Pit Fossil Site, Germany** in order to strengthen the integrity of the inscribed property and support its effective protection and management;
3. Notes with appreciation the submission of a fully revised management plan for the property, including its buffer zone, and encourages the State Party to fully implement the plan on an ongoing basis.

Map 1: Location and boundaries of the property and proposed buffer zone.

B. Mixed Properties

B1 New Nominations of Mixed Properties

ASIA / PACIFIC

THE CENTRAL HIGHLANDS OF SRI LANKA: ITS CULTURAL AND NATURAL HERITAGE

SRI LANKA



WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

THE CENTRAL HIGHLANDS OF SRI LANKA: ITS CULTURAL AND NATURAL HERITAGE (SRI LANKA) ID N° 1203

1. DOCUMENTATION

- i) **Date nomination received by IUCN:** 16th March 2009
- ii) **Additional information officially requested from and provided by the State Party:** Additional information was requested from the State Party following the IUCN World Heritage Panel, and was provided to the World Heritage Centre and IUCN in February 2010, including a hard copy of the "Operational Plan for the Laggala Section of the Knuckles Conservation Forest".
- iii) **UNEP-WCMC Data Sheet:** Relevant datasheets on comparable properties were consulted; a datasheet will be elaborated in relation to the Committee's consideration of the nomination.
- iv) **Additional Literature Consulted:** Meegaskumbura, N. Beenaerts et al. (2004). **Local endemism within the Western Ghats – Sri Lanka biodiversity hotspot.** *Science* 306: 479-481.; Brooks, T.M., R.A. Mittermeier, C.G. Mittermeier et al. (2002). **Habitat loss and extinction in the hotspots of biodiversity.** *Conservation Biology* 16: 909-923. Collins, J., N.M., J.A. Sayer and T.C. Whitmore (eds.) (1991). **The Conservation Atlas of Tropical Forests: Asia and the Pacific.** Macmillan Press, London, UK.; Davis, S.D., V.H. Heywood and A.C. Hamilton (eds.) (1995). **Centres of Plant Diversity: A Guide and Strategy for their Conservation. Volume 2: Asia, Australasia and the Pacific.** WWF, Gland, Switzerland and IUCN, Cambridge, UK.; Gunawardene, N.R., A.E. Dulip Daniels, I.A.U.N. Gunatilleke et al. (2007). **A brief overview of the Western Ghats – Sri Lanka biodiversity hotspot.** *Current Science* 93: 1567-1572. Helgen, K.M. and C.P. Groves (2005). **Biodiversity in Sri Lanka and the Western Ghats.** *Science* 308: 199.; IUCN (2004). **The World Heritage List: Future priorities for a credible and complete list of natural and mixed sites.** IUCN, Gland, Switzerland; Magin, C. and S. Chape (2004). **Review of the World Heritage Network: Biogeography, Habitats and Biodiversity.** IUCN, Gland, Switzerland and UNEP-WCMC, Cambridge, UK; Meegaskumbura, M., F. Bossuyt, R. Pethiyagoda et al. (2002). **Sri Lanka: An amphibian hot spot.** *Science* 298: 379.; Mittermeier, R.A., P. Robles Gil, M. Hoffmann et al. (2004). **Hotspots Revisited.** CEMEX, Mexico City, Mexico.; Mittermeier, R.A., J. Ratsimbazafy, A.B. Rylands et al. (2007). **Primates in peril: the World's 25 most endangered primates, 2006-2008.** *Primate Conservation* 22: 1-40.; Myers, N., Olson, D.M., E. Dinerstein, E.D. Wikramanayake, et al. (2001). **Terrestrial ecoregions of the world: a new map of life on Earth.** *BioScience* 51 (11): 933-938.; Olson, D.M. and E. Dinerstein (2002). Thorsell, J. and T. Sigaty (1997). **A Global Overview of Forest Protected Areas on the World Heritage List.** IUCN, Gland, Switzerland.
- v) **Consultations:** Ten external reviewers consulted. The mission met with senior representatives of the State Party including the Minister for Environment & Natural Resources, representatives from relevant ministries, departments, universities, UNESCO National Committee, as well as community groups and stakeholder representatives.
- vi) **Field Visit:** Vinod Mathur, with Jane Lennon, ICOMOS, September/October 2009.
- vii) **Date of IUCN approval of this report:** 15th April 2010.

2. SUMMARY OF NATURAL VALUES

The nominated property Central Highlands of Sri Lanka (CHSL) is a serial proposal comprising three component parts, details of which are shown in Table 1. The nomination is for inscription as a mixed property, and has been made under all four natural criteria, as well as three cultural criteria. This nomination addresses the natural values of the

property; the cultural values have been evaluated by ICOMOS.

Sri Lanka's highlands, where the land rises to an elevation of over 2,500 m.a.s.l., are situated in the south-central part of the island. The three component parts of the nominated property share common features of their mountainous terrain, but also have prominent physiographic differences.

Table 1: Component parts of the nominated property

Name	Area (ha)	Buffer zone
1. Peak Wilderness Protected Area (PWPA)	20,596	An area (37,571) ha has been identified conceptually as a buffer zone but has not been legally defined.
2. Horton Plains National Park (HPNP)	3,109	No buffer zone has been identified/delineated.
3. Knuckles Conservation Forest (KCF)	31,305	An area (35,074 ha) has been identified conceptually as a buffer zone but has not been legally defined.

The PWPA has a cone-shaped mountain top that reaches a sharp peak (Adam's Peak) at an elevation of 2,243 m. The terrain in PWPA is very rugged with steep escarpments, covering about 50 percent of the area. In HPNP, the terrain, for the most part, in contrast to the Adam's Peak Range, consists of gently undulating land forming a highland plateau situated at the southern edge of the arc of the anchor-shaped Central Massif. KCF is located in the heart of the extremely rugged Knuckles Massif and consists of peaks, a complex of interconnected steep escarpments with near vertical rock faces, plateaus and river valleys. Within the Knuckles Massif, there are 35 peaks, of which 14 are over 1500 m in altitude. The most distinctive among these are a set of five peaks which when viewed from afar resemble the knuckles of a clenched fist.

Geologically, nine-tenths of Sri Lanka is made up of extremely ancient, highly crystalline and metamorphic rocks of Precambrian age. The entire Central Highlands, including all three components of the nominated property, are composed of two main types of rocks: metamorphosed sediments and charnockite gneisses. Four major episodes of deformation have been recognized in the Central Highlands. Evidence of these episodes can be seen in the Knuckles region, where the main structure is a recumbent fold upon which, in a subsequent episode, upright folds have been superimposed.

Sri Lanka's evolutionary history is as a component of the Deccan Plate which has drifted north since the beginning of the Tertiary period and right up to the Miocene, and with land connections also occurring since then up to the Holocene. The island shares many biotic taxa with peninsular India. For example of the 173 families of angiosperms, 167 are peninsular. The total number of indigenous plants species in Sri Lanka is around 7000. This includes over 3000 angiosperm species of which 845 are endemic to the island. Among the pteridophytes, 57 of 314 species are endemic. It is this extraordinary endemism that occurs mainly at specific and intra-specific rank that makes the Sri Lankan flora of outstanding interest. The indigenous faunal species include 678 species of vertebrates and 262 species of migrant birds. Endemism is high in fauna too ranging from 50 percent in reptiles, 54 percent in freshwater fishes and 85 percent in amphibians.

The Sri Lankan montane rain forests represented by CHSL can in fact be considered a super-hotspot within the Western Ghats and Sri Lanka biodiversity hotspot. More than half of Sri Lanka's endemic vertebrates, half of the country's endemic flowering plants and more than 34% of its endemic trees, shrubs, and herbs are restricted to these diverse montane rain forests. The altitudinal range and location of the Knuckles at the ecotonal boundary between Sri Lanka's wet and dry climate zones has given rise to a diverse range of vegetation, which includes most of Sri Lanka's major associations. The flora of the Knuckles is so distinct that it is recognized as a separate floristic region within Sri Lanka. It contains part of a relict flora of Deccan-Gondwanic origin with a high level of species endemism and many montane and submontane taxa at the northern limits of their ranges in Sri Lanka. At least 10 of the 23 endemic bird species that make Sri Lanka an Endemic Bird Area also occur in the Knuckles range. The Peak Wilderness and Horton Plains, together with surrounding forest areas, comprise Sri Lanka's most important water catchments from which almost all the country's major perennial rivers originate. The Peak Wilderness is one of the few sites remaining in Sri Lanka with continuous tracts of forest altitudinally graded from lowland to submontane and montane rain / cloud forest. The flora of the Peak Wilderness and Horton Plains, which is a relic of Gondwanic flora, is characterised by high species endemism and much localized species distributions. Up to 13 of the 23 endemic bird species that make Sri Lanka an Endemic Bird Area occur in the Peak Wilderness and Horton Plains.

In the montane forests represented by the three serial properties, the faunal elements provide strong evidence of geological and biological processes in the evolution and development of taxa. The endemic purple-faced langur of Sri Lanka (*Semnopithecus vetulus*) has evolved into several morphologically different forms which occur within the three serial properties and exhibit allopatry, which could be considered as an ongoing process. Molecular genetic analysis shows that the Sri Lankan leopard, the only representative in the island of the genus *Panthera*, which diverged from other felids about 1.8 million years ago, is a unique sub-species (*Panthera pardus kotiya*) and distinct among the 10 sub-species of leopard found the

world over. All three nominated properties provide habitat to this subspecies of leopard, endemic to Sri Lanka.

The nominated property provides critical habitat to a number of other endemic vertebrate species including amphibians, reptiles, birds and mammals. These include two of the world's 25 most endangered primates: the Critically Endangered western purple-faced langur (*Trachypithecus vetulus nestor*) and the Endangered Horton Plains slender loris (*Loris tardigradus nycticeboides*). Although property-wide species figures were not provided in the nomination, the nominated property may contain more than a third of the Sri Lankan amphibian species, including two dozen or more Sri Lankan endemics (the nomination (pages 69-70) notes that CHSL provides habitat for 23 endemic frog species of the *Philautus* genus alone, of which at least 7 species are completely confined to the nominated property). The nominated property also provides critical habitat to a number of globally threatened plant and animal species (see Table 2).

3. COMPARISON WITH OTHER AREAS

The property has been nominated in relation to all four natural criteria. IUCN requested supplementary information on the comparative analysis from the State Party, in addition to its own consideration of global comparisons.

The case for inscription of the property in relation to criterion (vii) is based on the scenery and topography of the three components. The most dramatic feature within the property is 'World's End' in HPNP, where there is a near vertical drop of almost a kilometer which provides a spectacular view of the dry zone lowland plains, but this is not unique or outstanding at the global level. Similarly, the 35 peaks rising over 915 m in the KCF provide a view of rugged mountains, found nowhere else in Sri Lanka, but this view cannot be considered as unique or outstanding at the global level. There are many mountain protected areas of much greater size, and scale than the nominated serial property,

whose individual components are relatively small.

The basis for inscription under criterion viii is also not compelling. The landforms found within the property are of national and sub-regional importance, but are not particularly unusual or distinctive at the global scale. The geomorphological and geological values of the property do not approach those of major mountain properties already inscribed on the World Heritage List under this criterion in terms of scale (for instance in comparison to the Canadian Rocky Mountain Parks, Canada), nor are well known exemplars at the international level, such as the Dolomites, Italy or the Swiss Tectonic Arena Sardona, Switzerland. Whilst changes over geological time have had a profound impact on the composition of the biota in Sri Lanka, where biodiversity values and species endemism have become exceptionally high, this is not a basis for inscription of the property under criterion viii.

IUCN considered comparisons regarding the biodiversity values in conjunction with UNEP-WCMC. There are ten existing natural World Heritage properties inscribed under biodiversity criteria in the Indo-Malayan realm. Keoladeo National Park in India is however very small (2,873 ha), inscribed primarily for its wetland values, and does not include notable forest values. In addition to nine comparable inscribed properties, three Tentative List sites in the Indo-Malayan realm were also selected for this analysis due to their notable forest values: Western Ghats, (India); Transborder Rainforest Heritage of Borneo, (Indonesia/Malaysia); and Cat Tien National Park, (Viet Nam).

CHSL includes the largest and least disturbed remaining areas of the submontane and montane rain forests in Sri Lanka's south-western wet zone. These forests are globally important as they provide habitat for an exceptional number of endemic species of flora and fauna. IUCN's theme study on World Heritage forests in 1997 listed two component parts of the nomination in their list of forest protected areas which may merit consideration for WH nomination: Peak Wilderness and Horton Plains. (At that time, Knuckles had not

Table 2: Number of globally threatened species found within the components parts of CHSL (from Nomination Document)

Taxonomic group	Peak Wilderness	Horton Plains	Knuckles
Woody plants	147	14	71
Freshwater fish	-	-	2
Amphibians	17	10	10
Reptiles	1	-	2
Birds	9	3	5
Mammals	7	10	9
TOTAL	181	37	99

been designated as a conservation forest). The moist forests of the Western Ghats and south-western Sri Lanka are globally distinct due to their long history and isolation. The forests and rivers of the Western Ghats, India, have been identified by IUCN as being of potential Outstanding Universal Value in previous gap analyses. However, especially in terms of endemism, the comparably smaller Sri Lankan montane rain forests are of equal importance.

The component parts of CHSL stretch across two Udvady biomes and provinces: Peak Wilderness and Horton Plains belong to the Ceylonese rainforest province in the tropical humid forests biome, while Knuckles belongs at least in part to the Ceylonese monsoon forest province in the biome of tropical dry or deciduous forests (incl. monsoon forests) or woodlands. The only other natural World Heritage property in these provinces is Sinharaja Forest Reserve (SFR) (inscribed in 1988 under both biodiversity criteria), which is also in Sri Lanka, and also belongs to the Ceylonese rainforest province. Biogeographically, SFR is strongly related to the nominated property. The nominated property and SFR share values as the most important remnants of once extensive and contiguous natural forests. The contrast is that Sinharaja represents more lowland rain forests, whereas CHSL represents the Sri Lankan montane rain forests.

As the nomination notes, by world standards, the property and its three component parts are relatively small. The smallest component part, Horton Plains, is contiguous with the 20,596 ha Peak Wilderness and thus forms a contiguous component part of 23,705 ha. The nominated property as a whole exceeds the size of Kaziranga and Manas in India, and Gunung Mulu in Malaysia, but is far smaller than Sumatra and Ujung Kulon in Indonesia, Dong Phrayayen – Khao Yai and Thungyai – Huai Kha Khaeng in Thailand and the tentative list sites of the Western Ghats in India or Borneo in Indonesia and Malaysia. The component parts of the nominated property are all smaller than all forest properties or tentative list sites in the Indo-Malayan Realm except for Sinharaja in Sri Lanka. The property therefore makes a good case for recognition under criterion (ix), however there is no doubt that this would be strengthened by consideration of its linkage to the existing inscribed property of Sinharaja Forest Reserve.

The nomination also makes a strong case for inscription of CHSL under criterion (x). The nominated property is of global importance for the conservation of a range of species, including a large number of endemic and threatened species, in various taxonomic groups. The CHSL nomination includes two of the four Alliance for Zero Extinction sites in Sri Lanka, (i.e. sites that hold the last remaining populations of Critically Endangered or

Endangered species, in this case all amphibians). The nomination also includes three of the Important Bird Areas in Sri Lanka. Almost twenty years ago, the three component parts of the nominated property were also identified as three of the six Sri Lankan areas of particular significance for their rain forests. SFR was among the other three areas identified. Based on available information, the nominated property is overall comparable in species richness and endemism to a number of Indo-Malayan World Heritage properties inscribed under criterion (x).

In terms of species richness, CHSL surpasses smaller properties but is surpassed by some larger properties and properties that include “less isolated” rain forests. In terms of endemism, CHSL has more mammal species than Kaziranga, Sinharaja and possibly Manas and more endemic mammal species than Sinharaja and Borneo. It has more bird species than Sinharaja, and a number of endemic bird species similar to Sumatra, Gunung Mulu, Sinharaja, Western Ghats and Borneo. It also has more reptile species than any other property of its size and more species and endemic species of amphibians and freshwater fish than Sinharaja. Furthermore it has more plant species than Manas, Ujung Kulon and Sinharaja, and more endemic plant species than Sinharaja, Dong Phrayayen – Khao Yai and Cat Tien. Conversely it certainly has fewer mammal species than Sumatra, Gunung Mulu, Kinabalu, Dong Phrayayen – Khao Yai, Thungyai – Huai Kha Khaeng, Borneo and Cat Tien, fewer bird species than all properties except for Sinharaja and does not have the highest levels of species in relation to reptiles, amphibians, freshwater fish and plants.

IUCN considers that, despite being exceeded in values by some inscribed properties, the nominated property clearly has comparable biodiversity values to many existing World Heritage properties. However the values of the property for biodiversity would be further strengthened by more direct association with the closely related property of Sinharaja.

4. INTEGRITY, PROTECTION AND MANAGEMENT

4.1 Protection and management requirements

The whole of the PWPA is state-owned; the Conservation Forests within the PWPA are under the charge of the Forest Department whilst the newly declared Peak Wilderness Nature Reserve, and the pilgrim trails and peak are under the administrative control of the Department of Wildlife Conservation (DWLC). The PWPA comprises several parts falling under three categories of areas under protective legislation: (a) The Peak

Wilderness Nature Reserve (in nine blocks) which is a highly protected area under the provisions of the Fauna and Flora Protection Ordinance (FFPO), (b) the pilgrim trails and peak, which have the status of sanctuary under the provisions of FFPO, and (c) the three conservation forests have been designated under the provisions of Forest Ordinance.

The whole of HPNP is state-owned and under the administrative control of DWLC. HPNP has been designated under the provisions of FFPO. The FFPO also provides for prohibition of damaging activities within one mile of the boundary of both HPNP and PWPA. The KCF has also been declared as Conservation Forest in 2000 under the provisions of the Forest Ordinance. The Government of Sri Lanka has additionally notified 'Knuckles Environmental Protection Area' under the National Environment Act, 1980 under which ensures special protection in relation to planning schemes and projects to an area including KCF.

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

4.2 Boundaries

The small size of the components of the nominated property is a result of the limited extent of the most significant rain forest areas remaining on the island. However, if effectively protected and managed, the size and shape of CHSL and its component parts can be considered to be sufficient to maintain its values, especially since many of the plant and animal species have highly localized distributions. The boundary of PWPA includes a range of protected areas and this component has a common boundary with HPNP. Through a variety of procedures the boundaries appear to be securely gazetted within national laws. When the Knuckles Forest was earmarked for conservation it was decided to take the 3500 ft (1067 m) contour as the boundary. Subsequently, this decision was changed and it was decided to extend the limit to cover all contiguous forests even at lower elevations. The boundary now extends down the mountain slope, particularly in a north-east trending arm, to an elevation of ca 200 m. The new boundary needs to be reflected in updated national maps. There is a need to better delineate the entire boundary of the three components in the field.

The concept of 'buffer zone' and its boundary demarcation has been differently applied in each of the three component parts. IUCN sought supplementary information on buffer zones from the State Party. The nomination considers that there is no need for a buffer zone in case of HPNP as there are no human habitations in its periphery. The HPNP for its most part is surrounded by natural forests, protected and administered by the Forest Department

Proposed buffer zones surround three quarters of the PWPA and almost completely surrounds the KCF, and should provide an added layer of protection, and also include habitat for plant and animal species, including endemics, not represented in the property itself. The area surrounding KCF is stated to have been conceptually identified as the buffer zone by the Forest Department. Through the management plans of KCF, the Forest Department undertakes a wide range of activities through the community based organizations (CBOs) to strengthen conservation by public participation. However, the area has not been legally defined nor land marked as a buffer zone. A buffer zone for PWPA is also "conceptually" identified as a buffer zone but not legally defined nor land marked. The DWLC undertakes several community-based programmes within it to strengthen conservation and reduce dependence of the local communities on forest resources to a sustainable level. The mission heard appreciation from community members and CBO representatives, during different meetings, regarding the initiatives undertaken by the Forest Department and by the DWLC in their villages. IUCN does not consider that these areas represent fully functional buffer zones for the property, being instead area based community programmes, which appear to be positively received.

IUCN sought clarification of whether the State Party had considered the possibility of nominating the proposed property as a serial extension of Sinharaja Forest Reserve, rather than a separated property. The State Party noted that the nominated components are located in distinct geographical areas and cite several publications supporting considerable differences between montane and sub-montane forests and biota. Sinharaja is suggested as a different forest type and floristic region with strongly differing endemism and species richness. It is also referred to a number of studies on different taxonomic groups of the fauna, which suggest distinctiveness. The State Party also noted that the parallel consideration of cultural criteria meant there would have been no possibility of linking with the Sinharaja Forest. From a natural perspective, IUCN does not find the reasoning particularly convincing, as the relationships as remnants of the previously contiguous forests are very clear. IUCN recommends that the possibility of a linked serial extension of SFR should be considered by both the State Party and the World Heritage Committee, in view of both the potential to strengthen integrity, and also gain the maximum benefits to conservation from the serial property concept, by promoting interaction and joint consideration of management issues.

IUCN considers that the boundaries of the property meet the requirements set out in the Operational Guidelines, but could be strengthened by association of the property as a serial extension of

the Sinharaja Forest Reserve. The areas stated to be buffer zones for KCF and PWPA are in need of formalization and clarification to ensure their long term functioning.

4.3 Management

The management of the three components of the nominated property is covered by the management plans for the Peak Wilderness Sanctuary, 1999-2003, Samanala Adaviya Protected Area Complex Management Plan, 2005, Management Plan of HPNP, 1999-2003 and 2005 and the Management Plan of KCF, 1994. IUCN requested clarification from the State Party about the current status and plans to update and renew the management plans. The response states that the Peak Wilderness Protected Area and Horton Plains have current management plans. For KCF the State Party notes that there are two operational plans, and that “a consolidated plan for KCF as a whole (in English) would be prepared based on the two operational plans”. IUCN notes that the status of management planning for all of the components of the property needs to be made consistent, with each covered by an effective and current management plan.

The conservation and management of the three nominated properties is financed through the annual budgets of the Forest and Wildlife Departments. The approximate allocations for the different components of the property amount to c.18 million Sri Lanka Rupees annually (in excess of USD150,000). In addition to the above, funds are also provided through donor funded projects. The Provincial Administration also provides additional funding support for some activities.

As noted in the Operational Guidelines, in the case of serial properties, a management system or mechanism for ensuring the co-ordinated management of the separate components is essential and should be documented in the nomination. This is presently not the case. The three nominated properties are administered by separate Management Plans prepared and implemented by two separate agencies. In addition the Ministry of Cultural Affairs and the Department of Archaeology would be implicated in the management system should the property be inscribed for its cultural values. The nomination contains an explanatory note on revising the system of management for PWPA, HPNP and KCF following acceptance for inscription on the World Heritage List⁷ has been provided. This states that a revised system of management would be developed and implemented within two years of the inscription of these properties on the World Heritage List. IUCN considers that more reflection and clearer plans are required to develop the necessary joint management, and is not convinced that the current plans are likely to be delivered effectively in the short timescale anticipated, given

the complexity of establishing an overall functional management regime.

IUCN further considers that more efforts are needed to engage the local communities and CBOs in providing protection to the nominated property. Coordination could be made more broad-based by including other relevant stakeholders such as civil society representatives and economic interests in site protection and the implementation of environmental regulations.

IUCN considers that the management of the property does not meet the requirements set out in the Operational Guidelines, considering in particular the lack of an overall management system for the nominated serial property.

4.4 Threats

The nature and magnitude of existing and potential threats to the three nominated properties varies between the components. In case of PWPA, the major human use is from 2 million pilgrims who visit the Adam's Peak annually and contribute to both forest and environmental degradation along the pilgrim trails leading up to the peak. Illicit gem mining with no ecological restoration also takes place in some sections in the periphery of PWPA. The Forest and Wildlife Departments have recently taken steps to address the above issues. A wide ranging protective legislation has been enacted rationalizing the legal status of the various constituents of PWPA, which give adequate mandate and powers to both DWLC and the Forestry Department to regulate the forest and environmental degradation. More efforts are needed to address the issue of environmental legislation, in which the Department of Culture and other relevant stakeholders can play a major role.

In HPNP the major threat is from the spread of invasive species European Gorse (*Ulex europaeus*), forest die-back, occasional fires and vandalism on the nature trail by the visitors. The DWLC efforts in the abatement of above threats needs to be further strengthened.

In KCF, the major threat is from cultivation of cardamom inside the forest. This spice crop was under-planted in some sections of the natural forests under a lease agreement scheme initiated by the FD many decades ago. What started on a small scale eventually extended beyond the leased areas. Maintenance work to sustain the cardamom crop resulted in a degradation of the natural forests. The Forest Department then took a series of measures to address this threat: the lease agreements were terminated and all resident cultivators were relocated elsewhere. The areas that were under-planted by the cardamom cultivators are now reverting to their natural forest state. Eleven of the former non-resident and

influential lessees continue to harvest cardamom from the land using hired labour, in spite of the expiry of their leases. The Forest Department has initiated legal action and court orders have been received against this illegal activity, which are now being implemented.

IUCN sought additional clarification in terms of addressing the corresponding threats to the values and integrity of the site. The State Party considers that adequate organization is in place and that inscription of the property could provide an “added incentive” for strengthening control and management of tourism. As regard the pilgrimage route, the State Party states that traditionally there is a closed season of six months during which there are hardly any visitors, allowing the ecosystem to recover, as well as a range of protective measures. IUCN considers that the monitoring of tourism should be strengthened to ensure that impacts are understood and fully addressed, both within the overall management of the property, and that of its individual component parts.

In summary, IUCN considers that the nominated property meets the requirements for integrity as set out in the Operational Guidelines, but the associations with Sinharaja Forest Reserve should be considered. The property does not fully meet the requirements for protection and management, which need to be strengthened, in relation to the overall management system for the property, establishment of consistent updated management plans for all of its components parts, strengthened tourism monitoring and clarified and effective buffer zones.

5. ADDITIONAL COMMENTS

5.1 Justification for Serial Approach

(a) What is the Justification for serial approach?

The serial approach is justified from a biodiversity perspective because the three component parts belong to the same biogeographic province or the same ecosystem type (as required by paragraph 137 of the Operational Guidelines). The nature of the component parts as isolated remnants of previous continuous forests also corresponds well to a serial approach. The justification is less compelling from a landscape or geological perspective, considering that the landforms and geology continue over a much greater area of the property.

(b) Are the separate components of the property functionally linked?

The three components of the nominated property are functionally linked to a large extent in relation to

conservation of biodiversity. They all contribute to the representation and conservation of the montane and sub-montane forest elements of the ‘Ceylonese Rainforests’. The three serial properties along with contiguous forests form a functionally linked series. The functional links with the Sinharaja Forest Reserve are equally strong, on the same basis.

(c) Is there an overall management framework for all the components?

As noted above, there is not currently an overall management framework for all of the components.

6. APPLICATION OF CRITERIA

The Central Highlands of Sri Lanka: Its Cultural and Natural Heritage has been nominated as a mixed property under all four natural criteria. The nominated property has been evaluated in relation to cultural criteria by ICOMOS:

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

The property contains nationally important phenomena, including attractive natural landscapes which are found nowhere else in Sri Lanka. However these values are not unique or outstanding at the global level. There are many mountain protected areas of much greater size, and scale than the nominated serial property, whose individual components are also relatively small in relation to the conservation of natural landscapes.

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

Criteria (viii): Earth’s history and geological features.

The landforms found within the property are of national and sub-regional importance, but are not particularly unusual or distinctive at the global scale. The geomorphological and geological values of the property do not approach those of the major mountain properties already inscribed on the World Heritage List, nor are well known exemplars at the international level. Whilst changes over geological time have had a profound impact on the composition of the biota in Sri Lanka where biodiversity values and species endemism have become exceptionally high, this is not a basis for inscription of the property under criterion viii.

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

Criteria (ix): Ecological processes

The nominated includes the largest and least disturbed remaining areas of the submontane and montane rain forests of Sri Lanka, which are a global conservation priority on many accounts. The component parts of stretch across two Udvady biomes and provinces: the Ceylonese rainforest and the Ceylonese monsoon forest in the biome of tropical dry or deciduous forests (incl. monsoon forests) or woodlands. In the montane forests represented by the three serial properties, the faunal elements provide strong evidence of geological and biological processes in the evolution and development of taxa. The endemic purple-faced langur of Sri Lanka (*Semnopithecus vetulus*) has evolved into several morphologically different forms recognizable today. The Sri Lankan leopard, the only representative in the island of the genus *Panthera*, which diverged from other felids about 1.8 million years ago, is a unique sub-species (*Panthera pardus kotiya*) and distinct among the 10 sub-species of leopard found the world over. All three nominated properties provide habitat to this subspecies of leopard, endemic to Sri Lanka. Long isolation and the concomitant evolutionary processes have also resulted in a Sri Lankan molluscan fauna that is the most distinct in the South Asian region. The only other natural World Heritage property in these provinces is Sinharaja Forest Reserve, also in Sri Lanka, which belongs to the Ceylonese rainforest province. Biogeographically, Sinharaja is strongly related to the nominated property and they share values as the most important remnants of once extensive and contiguous natural forests.

IUCN considers that the nominated property meets this criterion, however it would be strongly preferable to associate it by inscription with the closely linked area of Sinharaja Forest Reserve, which is already inscribed on the World Heritage List.

Criteria (x): Biodiversity and threatened species

Considering its size, the nominated property features exceptional numbers of threatened species, exceptional levels of endemism, including higher-level endemism, and high levels of richness in a number of taxonomic groups. Of the 408 species of vertebrates recorded in the three properties, 141 are endemic and many of these are strictly montane species. Eight three percent of indigenous fresh water fishes and 81% of the amphibians in PWWA are endemic, 91% of the amphibians and 89% of the reptiles in HPNP are endemic, 64% of the amphibians and 51% of the reptiles in KCF are endemic. The montane forests in the three serial properties contain the only habitats of many threatened plant and animal species and are therefore of prime importance for their in-situ

conservation. The biodiversity conservation values of the property complement those of the Sinharaja Forest Reserve.

IUCN considers that the nominated property meets this criterion, however it would be strongly preferable to associate it by inscription with the closely linked area of Sinharaja Forest Reserve, which is already inscribed on the World Heritage List.

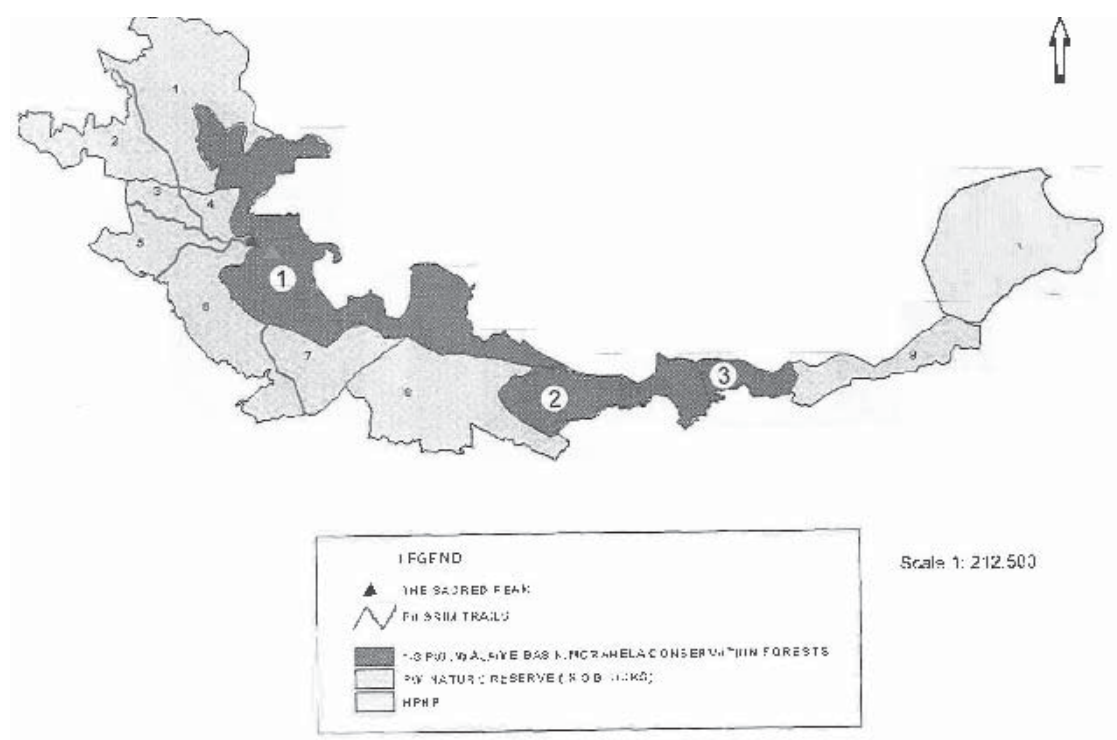
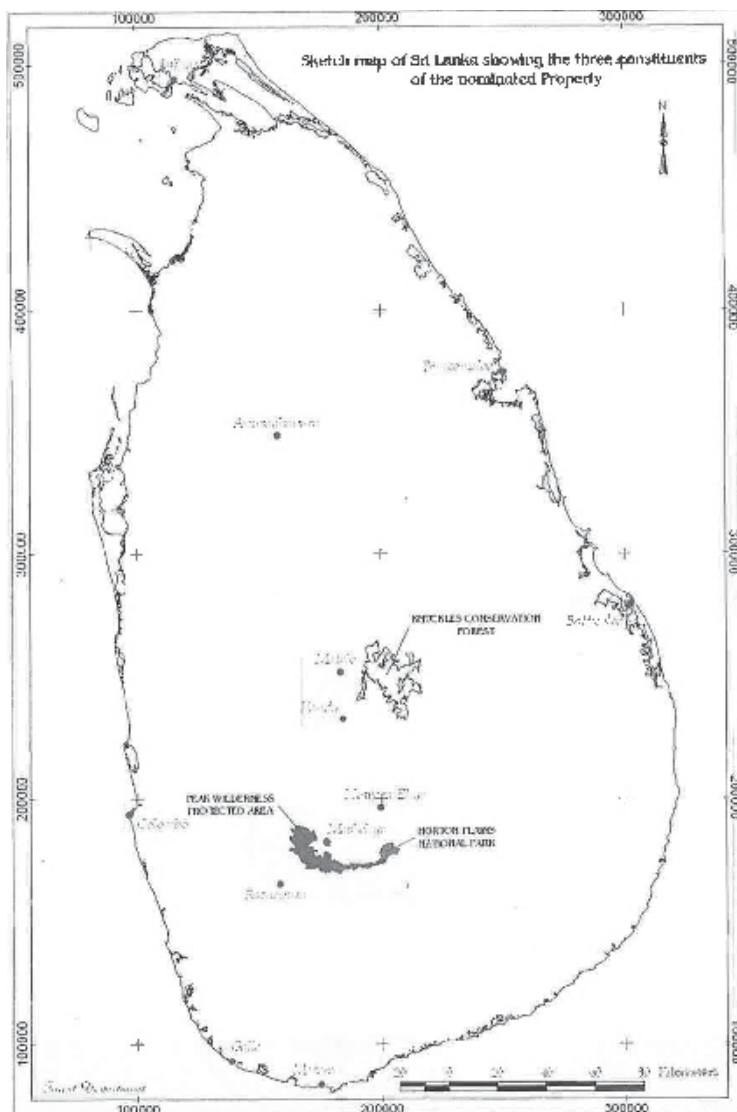
7. RECOMMENDATIONS

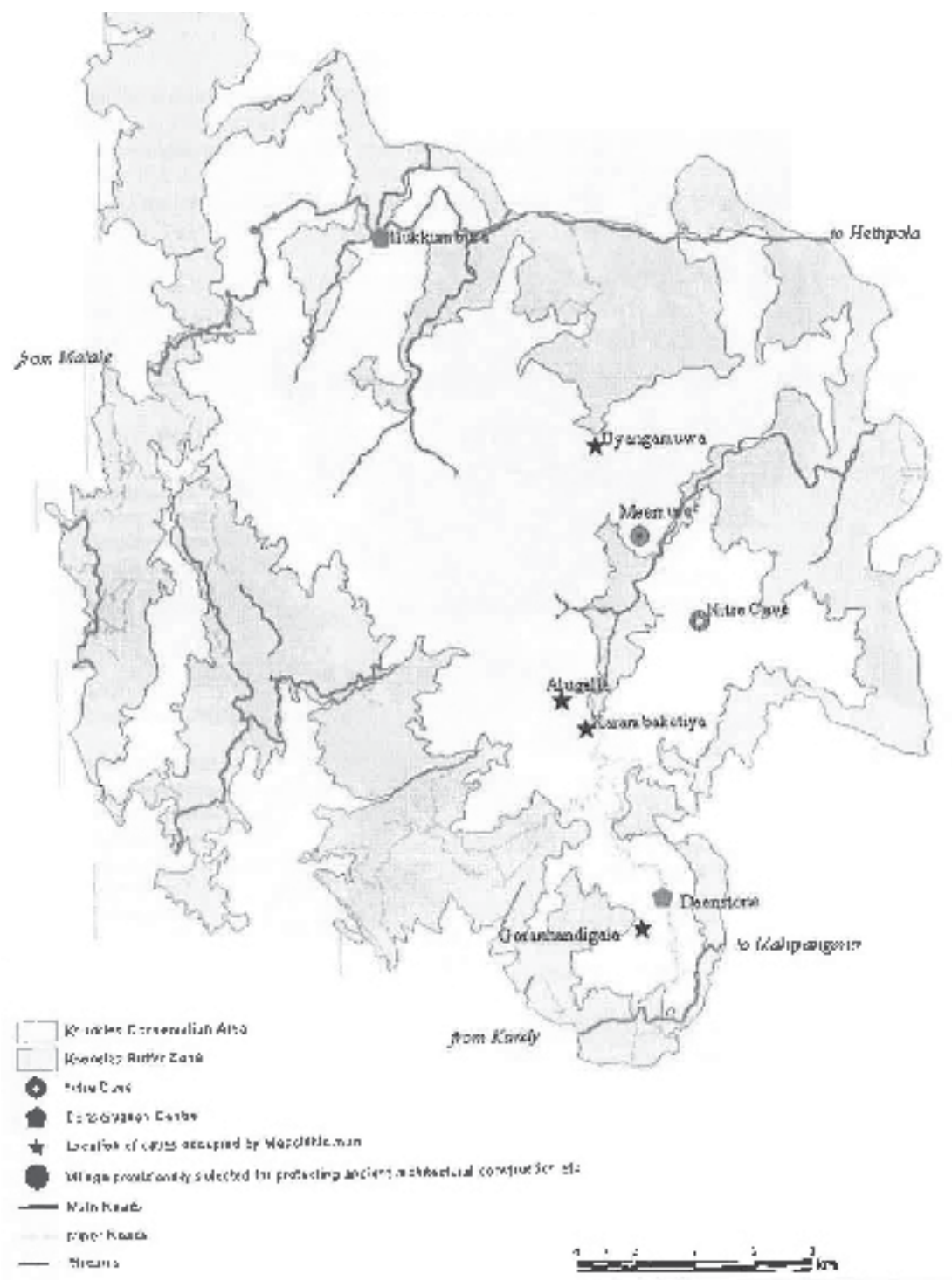
IUCN recommends that the World Heritage Committee adopt the following decision, noting that as the nomination is for a mixed property, the IUCN recommendations will be harmonized with those of ICOMOS in preparing the draft decision for the Committee.

The World Heritage Committee,

1. Having examined Documents **WHC-10/34.COM/8B** and **WHC-10/34.COM/INF.8B2**,
2. Decides not to inscribe the Central Highlands of Sri Lanka: its Cultural and Natural Heritage, Sri Lanka on the World Heritage List under natural criteria (vii) and (viii);
3. Refers the examination of the nomination of the **Central Highlands of Sri Lanka: its Cultural and Natural Heritage, Sri Lanka**, to the World Heritage List on the basis of natural criteria (ix) and (x) to allow the State Party to address a number of significant issues related to the integrity and management of the nominated property;
4. Recommends the State Party to:
 - a) Establish an overall management framework for the serial property, as required in the Operational Guidelines, and to also establish completed and effective management plans for each of the component parts of the property;
 - b) Establish effectively functioning buffer zones for the property, which will ensure its protection from threats arising from outside its boundaries in consultation with local stakeholders;
 - c) Establish a fully effective management and monitoring framework for tourism.

5. Recommends the State Party, in reconsidering the nomination, to evaluate the possibility to represent the nomination as a serial extension of the existing Sinharaja World Heritage Site, considering that the nominated property has complementary values to the existing property and meets the requirements to be one overall serial World Heritage property, as specified in the Operational Guidelines. The Committee considers that a single serial property would provide a more appropriate means of recognizing the Outstanding Universal Value of the remaining high conservation value forests on Sri Lanka than two separate inscriptions of the nominated property and of Sinharaja;
6. Strongly commends the State Party for the significant management and protection efforts in Peak Wilderness Protected Area, Horton Plains National Park and Knuckles Conservation Forest.

Map 1 and 2: Location of nominated component parts

Map 3: Sketch Map of the Knuckles Conservation Forest and buffer zone

EUROPE / NORTH AMERICA

PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT

USA



WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT (UNITED STATES OF AMERICA) ID NO. 1326

1. DOCUMENTATION

- i) **Date nomination received by IUCN:** 15th March 2009.
- ii) **Additional information officially requested from and provided by the State Party:** Additional information was requested from the State Party following the IUCN World Heritage Panel, and was provided to the World Heritage Centre, ICOMOS and IUCN in February 2010.
- iii) **UNEP-WCMC Data Sheet:** Sourced from nomination document which cites 556 references.
- iv) **Additional Literature Consulted (selection):** DeMartini, E.E. and Friedlander, M.A. (2006) **Predation, endemism, and related processes structuring shallow-water reef fish assemblages of the NWHI.** Atoll Res. Bull. 543: 237-256; Fefer, S.I., Harrison, C.S., Naughton, M.B. and Schallenberger, R.J. (1984) **Synopsis of results of recent sea bird counts in the Northwestern Hawaiian Islands.** Proc Res. Inv. NWHI. UNIHI-SEAGRANT-MR-84-01; Friedlander, A.M. and DeMartini, E.E. (2002) **Contrasts in density, size, and biomass of reef fishes between the northwestern and the main Hawaiian islands: the effects of fishing down apex predators.** Mar Ecol Prog Ser. Vol. 230: 253–264, 2002; Friedlander, A.M., Keller, K., Wedding, L., Clarke, A., Monaco, M. (eds.). (2009) **A Marine Biogeographic Assessment of the Northwestern Hawaiian Islands.** NOAA Technical Memorandum NOS NCCOS 84. NOAA Silver Spring, MD. 363 pp (and the references therein); Hillary, A., Kokkonen, M. and Max, L. (2002). World Heritage Papers 4: **Proceedings of the World Heritage Marine Biodiversity Workshop** UNESCO; IUCN; NOAA; UNF; Maragos, J.E. and Gulko, D. (eds) (2002) **Coral reef ecosystems of the North Western Hawaiian Islands: Interim results emphasizing the 2000 surveys.** USFWS and Hawai'i DNL, Honolulu, Hawai'i. 46pp; Parrish, F. and Abernathy, K. (2006) **Movements of monk seals relative to ecological depth zones in the lower Northwestern Hawaiian Islands.** Atoll Res. Bull. 543: 115-130; PMNM (2008) **Papahānaumokuākea Marine National Monument Management Plan.** Prepared by Papahānaumokuākea Marine National Monument, December 2008. USFWS, NOAA, Hawai'i DLNR. Vol 1-5; Smith, A. and Jones, K.L. (2007). **Cultural Landscapes of the Pacific Islands.** ICOMOS Thematic study. ICOMOS and UNESCO World Heritage Centre, December 2007. 132 pp; World Heritage Reports 12: **The State of World Heritage in the Asia-Pacific Region;** Waddell, J.E. and Clarke, A.M. (eds.) (2008) **The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States.** NOAA Center for Coastal Monitoring and Assessment (CCMA). 569pp (and the references therein).
- v) **Consultations:** 13 external reviews. Extensive consultations were conducted during the field mission including with representatives of management agencies, administrators in state and federal government, representatives of academic institutions and non-governmental organizations and cultural practitioners.
- vi) **Field Visit:** Jerker Tamelander, IUCN, jointly with Ian Lilley on behalf of ICOMOS; August 2009.
- vii) **Date of IUCN approval of this report:** 22nd April 2010.

2. SUMMARY OF NATURAL VALUES

Papahānaumokuākea Marine National Monument (PMNM) is located in the north-central Pacific Ocean, roughly 250 km northwest of the main Hawaiian Islands. The total area of the nominated property extends across the whole of PMNM and is approximately 362,075 km², of which around 14 km² are land areas. The natural values of greatest

significance noted in the nomination encompass earth science, near pristine ecosystems, high endemism and the habitats of threatened and endangered species.

In terms of their earth science values, the nominated property forms a major portion of the world's oldest and longest volcanic chain known as the Hawaiian – Emperor Archipelago, a well-studied example

of island hotspot progression. Hotspots are areas of exceptional volcanic activity beneath tectonic plates, where submarine volcanoes typically erupt in a series on a moving tectonic plate over a plume in the Earth's mantle to form volcanic seamounts, and emergent islands. As each eruptive centre moves away from the hotspot it gradually erodes. The hotspot volcanism thus results in a sequence of progressively younger islands, atolls and submerged banks representing the different stages of island and seamount formation and evolution. The Hawaiian Archipelago is also surrounded by seamounts that have not been formed by hotspot volcanism, likely remnants of continental mass and thus much older than the archipelago.

The large area of the nominated property encompasses a multitude of habitats, ranging from 4,600 m below sea level to 275 m above sea level at Nihoa, and including abyssal areas, seamounts and submerged banks, coral reefs, shallow lagoons, littoral shores, dunes, dry grasslands, shrublands as well as a hypersaline lake. The size of the archipelago, its biogeographic isolation and the distance between islands and atolls has led to distinct and varied habitat types and species assemblages. Due to the very limited human impacts, the marine ecosystems continue to be dominated by top predators, a rarity from the perspective of both conservation and a science. There are healthy populations of fish, and PMNM's reefs are remote, nearly pristine and thus represent one of the last remaining intact large-scale predator-dominated coral reef ecosystems. The prevalence of coral disease is low in the Northwestern Hawaiian Islands, and only a handful of introduced marine invertebrate species have been found there compared to 287 in the main Hawaiian Islands.

The geographic isolation of Hawai'i has resulted in some of the highest endemism of any tropical marine ecosystem: approximately 25% of the nearly 7,000 known marine species recorded are endemic to PMNM. Coral endemism in PMNM's reefs ranges from 24-42% and fish endemism from 20-62%. PMNM is also considered to be of outstanding importance for the conservation of a number of globally threatened species. It contains all six main reproductive sites of the Critically Endangered Hawaiian Monk Seal. Five species of threatened sea turtles occur in the waters PMNM, but only the endangered Green Turtle uses the shores of PMNM to bask and breed. PMNM contains more than 450 nesting sites of this species which amount to more than 90% of the total nesting area of its Hawaiian population.

Four species of globally threatened birds are endemic to PMNM: the Nihoa Millerbird, Nihoa Finch, Laysan Duck and Laysan Finch. The nomination notes that, collectively, PMNM is the largest tropical seabird rookery in the world with

more than 14 million birds. In total 5.5 million birds of 21 species breed annually on the islands, including 99% of the world's Laysan Albatross and 98% of the world's Black-footed Albatross, both globally threatened seabird species. Populations of several other seabirds are of global significance, including Bonin Petrel, Christmas Shearwater, Tristram's Storm-petrel and Grey-backed Tern. PMNM thus constitutes one of the largest and most significant strongholds of tropical seabirds in the world. Because of its high level of endemism and the near pristine nature of its reefs, PMNM represents a global biodiversity conservation priority, as assessed by a range of different global analyses.

PMNM is nominated as a mixed property, in relation to both its cultural and natural values. A detailed evaluation of the nomination under cultural criteria was conducted in parallel by ICOMOS.

3. COMPARISONS WITH OTHER AREAS

The nomination presents a substantial comparative analysis which has been augmented by the reviews received by IUCN, and further research undertaken by UNEP-WCMC in conjunction with IUCN. For the purpose of comparative analysis it was considered useful to differentiate the earth science values of the nominated property from its ecological and biological values.

In relation to earth science values, the scale, distinctness and linearity of the manifestation of these geological processes in PMNM are unrivalled and played a major role in the development of hotspot theory by Canadian geophysicist and geologist John Tuzo Wilson. While there are a number of other notable examples of hotspot trails these tend to be seamount chains and do not include emergent land.

Of the Pacific archipelagos formed by oceanic hotspots none are as old and extensive as the Hawaiian archipelago. The Society and Marquesas island groups provide less clear hotspot progression, while the Austral islands, where the hotspot is still active, are far less expansive and do not contain true atolls. Of archipelagos in the Indian Ocean only the Chagos Archipelago is of comparable magnitude to PMNM. However, its geological morphology is different and associated with volcanism over a mid-oceanic ridge. Similarly, Atlantic island groups are by and large associated with mid-oceanic ridges, while the Greater and Lesser Antilles are influenced by a multitude of processes not present at PMNM due to distance from continental landmasses.

There is therefore a strong case for inscription under criterion (viii) on the basis of the size and scale of

the property. It is important to note that Hawai'i is already recognised on the World Heritage list for its geological values. Hawaii Volcanoes National Park preserves the current active manifestations of the Hawai'i hotspot in the form of Mauna Loa and Kilauea volcanoes. The values of the nominated property are directly connected to the values in Hawaii Volcanoes National Park and jointly present a very significant testimony of hotspot volcanism. The relationship to Hawaii Volcanoes National Park which is a more immediate and visible manifestation of the same natural geological phenomena represented in PMNM is a factor that is in need of further consideration.

In terms of values for ecosystems it is noted that the Hawaiian Archipelago is the longest and most isolated chain of tropical islands in the world. Ecological processes continue to be only modestly influenced by human beings. PMNM includes a wide range of terrestrial and pristine marine ecosystems and communities with their associated ecological and biological processes. The sheer size, both horizontally and vertically, the diversity of habitats and the naturalness of PMNM make this property exceptional. Due to the minimal human impacts the marine ecosystems of PMNM are dominated by apex predators. At a time when most reef systems around the world have seen a dramatic decline of top predators the area is thus not only of recognized conservation importance but a major scientific reference.

PMNM contains significant areas of marginal reef environments, including the world's northernmost atoll. Other marginal reefs are represented on the World Heritage list, e.g. in the iSimangaliso Wetland Park (South Africa), however the geographical setting is completely different to that of the property. The Great Barrier Reef (Australia), Lagoons of New Caledonia: Reef Diversity and Associated Ecosystems (France), Sian Ka'an (Mexico), and Belize Barrier Reef Reserve System (Belize) all contain extensive coral reef habitat, however, they are all under the influence of processes associated with continental landmasses. No World Heritage properties currently include coral reefs representative of the central deep Pacific.

Four marine coralline sites inscribed on the World Heritage List, Tubbatu Reefs Natural Park (Philippines), East Rennell (Solomon Islands), Aldabra Atoll (Seychelles), and Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves (Brazil) are atolls, but of different geological history, the latter three being primarily raised atolls while Tubbatu is highly influenced by its location in the dense Southeast Asian archipelago, as is Komodo National Park (Indonesia). They also all exhibit oceanographic conditions different to those in PMNM.

PMNM is also clearly differentiated from the Galapagos Islands (Ecuador), likewise a chain of oceanic islands in the Pacific. The Galapagos Islands lie on the Equator, while PMNM lies in the transition zone between the tropics and subtropics. Galapagos also does not encompass many of the features found in PMNM such as true atolls, low reef islands, seamounts, and submerged banks.

While not outstanding in terms of species richness when compared to existing World Heritage properties and other marine areas, the nominated property has one of the highest degrees of marine species endemism globally among taxa for which reliable data is available. Among World Heritage properties only Islands and Protected Areas of the Gulf of California (Mexico), Coiba National Park and its Special Zone of Marine Protection (Panama), and Rapa Nui National Park (Chile) have comparable (although lower) levels of fish endemism, but Rapa Nui does not include a marine component while the Gulf of California and Coiba are inshore coastal systems and thus under very different hydrographic regimes. The property supports a greater number of endemic species than other areas to the southwest, including the Phoenix Islands Protected Area (PIPA) in Kiribati, and it has greater reef development and diversity than reefs further east in the Galapagos Islands or eastern Polynesia. PMNM is home to 22 globally threatened species and PIPA is home to 20 globally threatened species. According to IUCN's Species Information System, PMNM and PIPA overlap with the distribution ranges of 31 and 52 threatened species of corals, mammals and birds. Coral diversity is also about four times higher in PIPA than PMNM. Overall, 28% of the assessed coral, bird and mammal species that overlap with PMNM are threatened, compared to 19% in PIPA. Both PMNM and PIPA are characterised by predator-dominated intact marine ecosystems with healthy populations of fish, including large numbers of top predators, corals and sea turtles. PMNM is also the largest tropical seabird rookery in the world, i.e. the seabird populations surpass any other tropical area, inscribed or not on the World Heritage list in terms of diversity and numbers.

Other tropical or subtropical marine protected areas comparable in size to PMNM include the Marianas Trench Marine National Monument, the Pacific Remote Islands Marine National Monument (both United States of America) and the Palau Shark Sanctuary (Palau). None of them share the patterns of endemism and apex domination, the marginal reef environment and the distinct island hotspot progression geology. No other large-scale marine protected area in the world provides the degree of protection present in PMNM, including strict regulation of all forms of activity and use throughout. Whilst other areas have higher species richness, PMNM is thus of critical importance for

a number of globally threatened species, including one marine mammal and several bird species.

4. INTEGRITY

4.1. Protection

The entire area is owned and controlled by the Governments of the United States of America and the State of Hawai'i. Due to historical reasons the monument includes large federally administered areas, state land (Kure), as well as Midway, technically a so-called unorganized, unincorporated territory of the United States. There is no private ownership of land or waters within the monument. The Monument was established in 2006 through Presidential Proclamation, which prohibits unauthorized access, bans dumping of waste and resource extraction, with a phasing out of the commercial fishery. It provides for controlled visitation to Midway Atoll, and provides for educational and scientific activities as well as Native Hawaiian cultural activities. The proclamation does not modify or diminish existing jurisdictions, such as an Ecosystem Reserve, a Marine Refuge, National Wildlife Refuges and a State Seabird Sanctuary, some of which date back more than 100 years. Several additional laws apply to the monument, including e.g. the Endangered Species Act and the Migratory Bird Treaty Act.

The Papahānaumokuākea Particularly Sensitive Sea Area (PSSA) has the same boundaries as the Monument, and six Areas to be Avoided (ATBA) have also been adopted by the International Maritime Organization (IMO), each extending out 50 nautical miles or 92.6 kilometres from the centre of islands or atolls. The licensed fishery operating in the monument will be phased out by 15 June 2011. Presently there are eight licenses although some licensed ships do not fish the area and harvest is reportedly below catch limits.

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 property have been clearly defined, and are set 50 nautical miles (92.6 kilometres) from emergent land. They are identified as a series of geographic coordinates and interconnecting lines. Thus the entirety of the monument boundary falls in the pelagic, mostly over abyssal areas.

Buffer zones have not been identified as the boundaries of the monument are not directly impacted by activities for which buffer zones would provide effective protection. Possible threats from shipping have been dealt with through IMO PSSA

and ATBA designations. The monument boundaries as well as PSSA and ATBA related regulations have been included on marine charts used in the United States and also communicated globally, including through IMO, and thus appear on up-to-date versions of both electronic and printed navigational charts.

In spite of its large area the property may offer some possibilities of extension, subject to further research on biological connectivity and speciation processes. For example, study of deeper habitat and species, which is currently in its infancy, may warrant extension of the property to include additional seamounts, submerged banks or other features presently outside or only partially included in the monument area. Biological connectivity between the nominated property and atolls and islands to the south may provide basis for consideration of serial nominations. The State Party is encouraged to further explore such potential through ongoing research.

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

4.3 Management

Management responsibilities rest with three co-trustees: the State of Hawai'i, through the Department of Land and Natural Resources (DLNR); the U.S. Department of the Interior, through the Fish and Wildlife Service (FWS); and the U.S. Department of Commerce, through the National Oceanic and Atmospheric Administration (NOAA). The co-trustees have entered into a Memorandum of Agreement setting out mechanisms for managing the Monument including roles and responsibilities, decision making and coordinating bodies. There are clear and effective governance arrangements including a Monument Management Board, composed of representatives of NOAA, FWS, the State of Hawai'i and the Office of Hawaiian Affairs, which carries out the day-to-day management and coordination of Monument activities. An Interagency Coordinating Committee has been established to engage other state and federal agencies that support monument operations. Protection of, and research into, the traditional and cultural values of the monument are inscribed both in the Executive Order establishing the monument and its management plan. IUCN noted the engagement of representatives of the indigenous Hawaiian community in the management of the property during its evaluation mission, meeting with a variety of native Hawaiian stakeholders and leaders, and interaction with members of the Centre for Hawaiian Studies at the University of Hawai'i, the cultural advisory committee of the monument and the Office of Hawaiian Affairs.

Management aims, objectives and jurisdictions are laid out in a comprehensive 15-year Monument Management Plan, to be reviewed every five years. The plan sets out strategic objectives and defines 22 thematic Action Plans that address identified priority needs. The action plans are well conceived and clearly structured, addressing many threats and identifying many research and management needs. There is a GIS database incorporating research data, habitat classifications, species distributions, cultural sites and data, a spatial bibliography of published literature and information on activities carried out under permit in the monument. Importantly, this also includes a Management Plan Tracking Tool, which incorporates indicators and activities defined in relation to priorities identified in the management plan.

Capacity for implementation of monument management activities varies among the three co-trustees, both in terms of finances and human resources. Funding for monument management is provided largely through federal as well as through State budgets. Although approved on an annual basis by Congress and state legislative assembly, commonly as part of broader funding packages, it constitutes a reliable and sustainable mechanism for supporting management activities at the property. Annual Monument budgets come from NOAA/NOAA-Fisheries, FWS, the State of Hawai'i, the Office of Hawaiian Affairs. There are also contributions from the public, interest groups and organizations, a model with potential for expansion.

The management authorities generally have strong technical and financial capacity. It is important to note that their management mandates rely on partnerships both for research and enforcement. Sound collaboration with state/national institutions and other branches of co-trustee agencies in the implementation of many Action Plans has been achieved. Enforcement of regulations is a challenge due to the isolation and size of the monument. A direct collaboration with the US Coast Guard has been established. The effectiveness of enforcement requires constant monitoring and further development of surveillance technology as well as operational means of intervention in case of breaches. There is room for improvement and consolidation, for example emergency response plans to minimize the impacts of groundings and/or spills were still under development at the time of the IUCN/ICOMOS evaluation mission.

The process for considering permits for activities in the monument is moving from disparate procedures run by each co-trustee agency towards a single unified mechanism that is both rigorous and transparent. The process is still subject to much discussion, and is presently subject to a challenge through court proceedings, but provides an example

of how the co-trustees have promoted integration, and will provide valuable lessons learned that can serve to direct further efforts. IUCN is concerned that the multiple jurisdictions and the multi-agency management arrangement created around them still seem overly complex; each co-trustee still operates institutionally disconnected processes with separate procedures, budgets, staff etc. Although the complex management structure of the monument is a product of the terms of the Executive Order establishing the monument, federal as well as state law, there may be a case for studying options for even more far-reaching integration, e.g. into a single management authority for the monument with unified budgets and co-located staff.

PMNM has a public face projected through a website and the Mokupāpapa Discovery Centre in Hilo on Hawai'i island, and various campaigns and educational programmes serve to further understanding and involvement of stakeholder groups. These are all well conceived but would benefit from scaling up and further elaboration for the monument to achieve its objective of "bringing the monument to people" rather than vice versa, which is necessitated by the strict limitations on visits to the area. In particular, generating a broader understanding of the permitting and management effectiveness systems and procedures would serve to remove some of the concerns and misconceptions related to these among some stakeholder groups.

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

4.4 Threats

Human impacts within the property over the past 200 years include military activities, seabird egg and feather collection, whaling, guano mining and fisheries. Past use has significantly impacted the ecology and landscape of terrestrial systems on low-lying islands, most notably Midway, host to a military base and still an emergency airfield. Laysan provides a good example of successful restoration of an island completely altered by guano mining and other uses.

The nominated property is free from many of the threats facing most other marine or island protected areas in the world, such as land-based pollution and encroachment, and impacts associated with visitors are highly limited. However, five threats originating from outside the monument are of particular concern: ship groundings, Illegal, Unreported and Unregulated fishing (IUU), marine litter, introduction of invasive alien species and climate change.

The risk of ship groundings has been reduced through establishment of a PSSA and six ATBA. Any incidents would be due to significant human

error, complete technical breakdown, or extreme weather events. Incidents in the area over the past decades have been largely related to research, management or Navy operations. Corresponding emergency response plans to minimize the impacts of groundings and/or spills should become operational as soon as possible.

Commercial fishery in the area is being phased out. Although fishing is strictly regulated and not considered to compromise current management objectives of the property, recreational fisheries such as that around Midway and off some ships could be further curbed due to the possible secondary impacts. Fishing for cultural practices is allowed under the management plan, and managed to ensure minimal impacts.

The healthy fish and shark populations in the area are vulnerable to IUU fishing. The remoteness of the property and presently high fuel prices is considered to reduce these risks, but with continued depletion of fisheries elsewhere and the high market price of species found in abundance within and around the nominated property (e.g. tuna and sharks), these resources may be illegally targeted. A threats assessment process and development of a surveillance plan involving partnerships with the US Coast Guard but potentially also the US Navy is underway.

The biogeographical isolation of the monument means its ecosystems are particularly vulnerable to the introduction of alien and potentially invasive species. Several alien marine species have been recorded, although so far without known large-scale impacts. Conversely, the terrestrial environment of the low islands has been fundamentally altered through introductions of rats, rabbits and various plant species. The number of terrestrial invasive plants varies from three at Nihoa to 249 at Midway. Eradication of rats and rabbits has been successful and other eradication and rehabilitation efforts are permanently underway. There is hope that ecosystems relatively similar to those originally found on the islands can be restored, but continued and intensified efforts are required for decades to maintain gains made and eventually restore natural habitats. Presently the main potential vectors for species introduction are related to illegal incursions, management and research activities, and other permitted activities such as for cultural use. Management and other permitted activities are subject to protocols designed to minimize the risk of further species introduction, applicable both to activities in water and on land. The risks of species introductions from illegal activities can only be reduced through effective control and enforcement.

Marine litter is the most visible threat to the nominated property and although it presently does

not jeopardize many of the features for which the property has been nominated for inscription on the World Heritage list, impacts on endangered species is cause for concern. Originating from land as well as ships around the central and northern Pacific, enormous quantities of marine litter are transported to the monument, becoming stuck on reefs, in lagoons and washed ashore. While risks of entanglement are partly mitigated through removal campaigns on fishing nets, the problems of ingestion of small pieces of plastic by albatross cannot be mitigated. Comprehensive international efforts are required to reduce risks by addressing the problem of marine litter at source.

Climate change impacts are already observed to be affecting the property. It can be anticipated that the low-lying islands will increasingly lose area to inundation as well as erosion as a result of sea level rise, which is also likely to increase seawater intrusions during storms and extreme wave events. This is expected to have negative implications e.g. for sea turtle as well as seabird nesting. Elevated sea surface temperatures have already caused significant coral bleaching within the nominated property, and further increases may reduce foraging opportunities for seabirds due to changes in fish populations and behaviour. Acidification is less studied but may, in the medium and long term, impact deepwater habitats and ecosystems of the monument, such as deep reefs with possible implications for monk seal foraging grounds and other species. The monument is already under a strict management regime designed to maintain ecosystem health, which may confer resilience and increase adaptive capacity. The area lends itself to the study of the impacts of climate change on large, near-pristine marine ecosystems, an area of research where the monument can greatly contribute to conservation efforts around the globe.

Overall, the marine ecosystems of PMNM are in exceptionally good health compared to most other sea areas in the world, in large part due to historically low and presently strictly limited use of the area. Addressing the threats facing the monument requires action on multiple levels and by multiple stakeholders, but can maintain present conservation status with continued effort. Management and protection mandates, strategies and implementation arrangements are by and large sound and sufficient to address the threats facing the area, with some strengthening possible as identified herein.

In summary, IUCN considers the nominated property meets the conditions of integrity as set out in the Operational Guidelines.

5. ADDITIONAL COMMENTS

Evaluation of cultural aspects of the World Heritage nomination of the property is carried out by ICOMOS. IUCN considers there are important relationships between Native Hawaiian culture and practices and the natural values of the property, that are also a recognised factor in the management of the property. IUCN also noted that the islands of Papahānaumokuākea, notably Nihoa and Mokumanamana, play a central role in Native Hawaiian archaeology, cultural identity, tradition, and spiritual well being. There is increased interest in matters related to the nominated property, and IUCN heard a broad range of opinion on uses and interpretations, including from a range of leaders and representatives of indigenous people, regarding the associative cultural landscape of the property during the evaluation mission. The cultural uses of the property and their associations with nature, at their past and present levels, are positive and appropriate in relation to the conservation of the natural values of the property. Provided they do not change in favour of increased resource extraction, they can also increasingly contribute to ensuring these values are maintained.

6. APPLICATION OF CRITERIA

Papahānaumokuākea Marine National Monument, has been nominated as a mixed property under cultural criteria (iii), (iv), and natural criteria (viii), (ix) and (x). Evaluation of the nomination under criteria (iii) and (iv) is carried out by ICOMOS.

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

The property provides an illustrating example of island hotspot progression, formed as a result of a relatively stationary hotspot and stable tectonic plate movement. Comprising a major portion of the world's longest and oldest Volcanic chain, the scale, distinctness and linearity of the manifestation of these geological processes in PMNM are unrivalled and have shaped our understanding of plate tectonics and hotspots. The geological values of the property are directly connected to the values in Hawaii Volcanoes National Park and World Heritage property and jointly present a very significant testimony of hotspot volcanism. The property includes a significant portion of the largest and oldest feature of its kind, including the world's northernmost true atoll.

IUCN considers that the nominated property meets this criterion.

Criterion (ix): Ecological and biological processes

The large area of the property encompasses a

multitude of habitats, ranging from 4,600 m below sea level to 275 m above sea level, including abyssal areas, seamounts and submerged banks, coral reefs, shallow lagoons, littoral shores, dunes, dry grasslands and shrublands and a hypersaline lake. The size of the archipelago, its biogeographic isolation as well as the distance between islands and atolls has led to distinct and varied habitat types and species assemblages. PMNM constitutes a remarkable example of ongoing evolutionary and biogeographical processes as illustrated by its exceptional ecosystems, speciation from single ancestral species, species assemblages and very high degree of marine and terrestrial endemism. As many species and habitats remain to be studied in detail these numbers are likely to rise. Because of its isolation, scale and high degree of protection the property provides an unrivalled example of reef ecosystems which are still dominated by top predators such as sharks, a feature lost from most other island environments due to human activity.

IUCN considers that the nominated property meets this criterion.

Criterion (x): Biodiversity and threatened species

The terrestrial and marine habitats of PMNM are crucial for the survival of many endangered or vulnerable species the distributions of which are highly or entirely restricted to the area. This includes the critically endangered Hawaiian Monk Seal, four endemic bird species (Laysan Duck, Laysan Finch, Nihoa Finch and Nihoa Millerbird, and six species of endangered plants such as the Fan Palm. PMNM constitutes a vital feeding, nesting, and nursery habitat for many other species including seabirds, sea turtles and cetaceans. With 5.5 million sea birds nesting in the monument every year and 14 million residing in it seasonally it is collectively the largest tropical seabird rookery in the world, and includes 99% of the world's Laysan Albatrosses (vulnerable) and 98% of the world's Black-footed Albatrosses (endangered). Despite relatively low species diversity compared to many other coral reef environments, the property is thus of very high in situ biodiversity conservation value.

IUCN considers that the nominated property meets this criterion.

7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopt the following draft decision in relation to the natural elements of the property. Considering the property is nominated as a mixed property, IUCN will integrate this recommendation with that of ICOMOS, as appropriate, considering the view ICOMOS takes in relation to the cultural values of the property.

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

The World Heritage Committee,

1. Having examined Documents **WHC-10/34.COM/8B** and **WHC-10/34.COM/INF.8B2**,
2. Inscribes **Papahānaumokuākea Marine National Monument, USA** on the World Heritage List under natural criteria (viii), (ix) and (x);
3. Adopts the following Statement of **Outstanding Universal Value**:

Brief synthesis

Located between in the north-central Pacific Ocean, Papahānaumokuākea Marine National Monument (PMNM) extends almost 2000 km from southeast to northwest. It makes up a significant portion of the Hawai'i-Emperor hotspot trail, constituting an outstanding example of island hotspot progression. Much of the monument is made up of pelagic and deepwater habitats, with notable features such as seamounts and submerged banks, extensive coral reefs, lagoons and 14 km² emergent lands distributed between a number of eroded high islands, pinnacles, atoll islands and cays. With a total area of around 362,075 km² it is one of the largest marine protected areas (MPAs) in the world, and is unique among large-scale MPAs in that all forms of use, including non-extractive use, are regulated and highly restricted throughout.

The geomorphological history and isolation of the archipelago have led to the development of an extraordinary range of habitats and features, including an extremely high degree of endemism. Largely as a result of its isolation marine ecosystems and ecological processes are virtually intact, leading to exceptional biomass accumulated in large apex predators. Island environments have, however, been altered through human use, and although some change is irreversible there are also examples of successful restoration. The area is host to numerous endangered or threatened species, both terrestrial and marine, some of which depend solely on PMNM for their survival.

Criteria

Criterion (viii): *The property provides an illustrating example of island hotspot progression, formed as a result of a relatively stationary hotspot and stable tectonic plate movement. Comprising a major portion of the world's longest and oldest Volcanic*

chain, the scale, distinctness and linearity of the manifestation of these geological processes in PMNM are unrivalled and have shaped our understanding of plate tectonics and hotspots. The geological values of the property are directly connected to the values in Hawaii Volcanoes National Park and World Heritage property and jointly present a very significant testimony of hotspot volcanism. The property includes a significant portion of the largest and oldest feature of its kind, including the world's northernmost true atoll.

Criterion (ix): *The large area of the property encompasses a multitude of habitats, ranging from 4,600 m below sea level to 275 m above sea level, including abyssal areas, seamounts and submerged banks, coral reefs, shallow lagoons, littoral shores, dunes, dry grasslands and shrublands and a hypersaline lake. The size of the archipelago, its biogeographic isolation as well as the distance between islands and atolls has led to distinct and varied habitat types and species assemblages. PMNM constitutes a remarkable example of ongoing evolutionary and biogeographical processes as illustrated by its exceptional ecosystems, speciation from single ancestral species, species assemblages and very high degree of marine and terrestrial endemism. For example, a quarter of the nearly 7,000 presently known marine species in the area are endemic. Over a fifth of the fish species are unique to the archipelago while coral species endemism is over 40%. As many species and habitats remain to be studied in detail these numbers are likely to rise. Because of its isolation, scale and high degree of protection the property provides an unrivalled example of reef ecosystems which are still dominated by top predators such as sharks, a feature lost from most other island environments due to human activity.*

Criterion (x): *The terrestrial and marine habitats of PMNM are crucial for the survival of many endangered or threatened species the distributions of which are highly or entirely restricted to the area. This includes the critically endangered Hawaiian Monk Seal, four endemic bird species (Laysan Duck, Laysan Finch, Nihoa Finch and Nihoa Millerbird, and six species of endangered plants such as the Fan Palm. PMNM constitutes a vital feeding, nesting, and nursery habitat for many other species including seabirds, sea turtles and cetaceans. With 5.5 million sea birds nesting in the monument every year and 14 million residing in it seasonally it is collectively*

the largest tropical seabird rookery in the world, and includes 99% of the world's Laysan Albatrosses (vulnerable) and 98% of the world's Black-footed Albatrosses (endangered). Despite relatively low species diversity compared to many other coral reef environments, the property is thus of very high in situ biodiversity conservation value.

Integrity

The boundaries of the property are all located in the ocean, but nevertheless have been clearly defined, demarcated on navigational charts and communicated widely. The large size of the property ensures inclusion of a wide variety of habitat types, including a highly significant area of marginal reef environment as well as submerged banks and deepwater habitat. It also ensures a high degree of replication of habitat type. Although past use has altered some terrestrial environments the property is still predominantly in a natural state: its nature conservation status is exceptional. This is largely due to its isolation as well as a combination of management and protection efforts, some dating back more than 100 years, including national natural resource protection legislation as well as internationally adopted restrictions. The integrity of the property and its ecological processes are in excess of most other island archipelagos and most other tropical marine environments in the world.

Management and protection requirements

PMNM is a highly protected area established through Presidential Proclamation in 2009, which adds to pre-existing state, federal and international legal mandates that govern management of spatially defined areas, species, or provide overarching regulations on environmental protection. Management responsibilities rest with three co-trustees: the State of Hawai'i, the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration. The co-trustees have entered into a Memorandum of Agreement setting out mechanisms for managing PMNM, including roles and responsibilities, decision making and coordinating bodies.

The multiple jurisdictions have created a complex institutional environment for management of the property, but management planning and intervention practices are well conceived. In view of the threats facing the property, almost all of which originate outside its boundaries, multi-agency involvement and participation, if governed well, is a strength provided the complexity does not compromise operational

capacities and the ability to quickly respond to challenges.

Management aims, objectives and jurisdictions are laid out in a Monument Management Plan which includes strategic objectives and detailed thematic action plans that address priority needs. It is important that these efforts are sustained with the aim to increase streamlining, including of mechanisms for supporting monument activities, stakeholder participation and outreach.

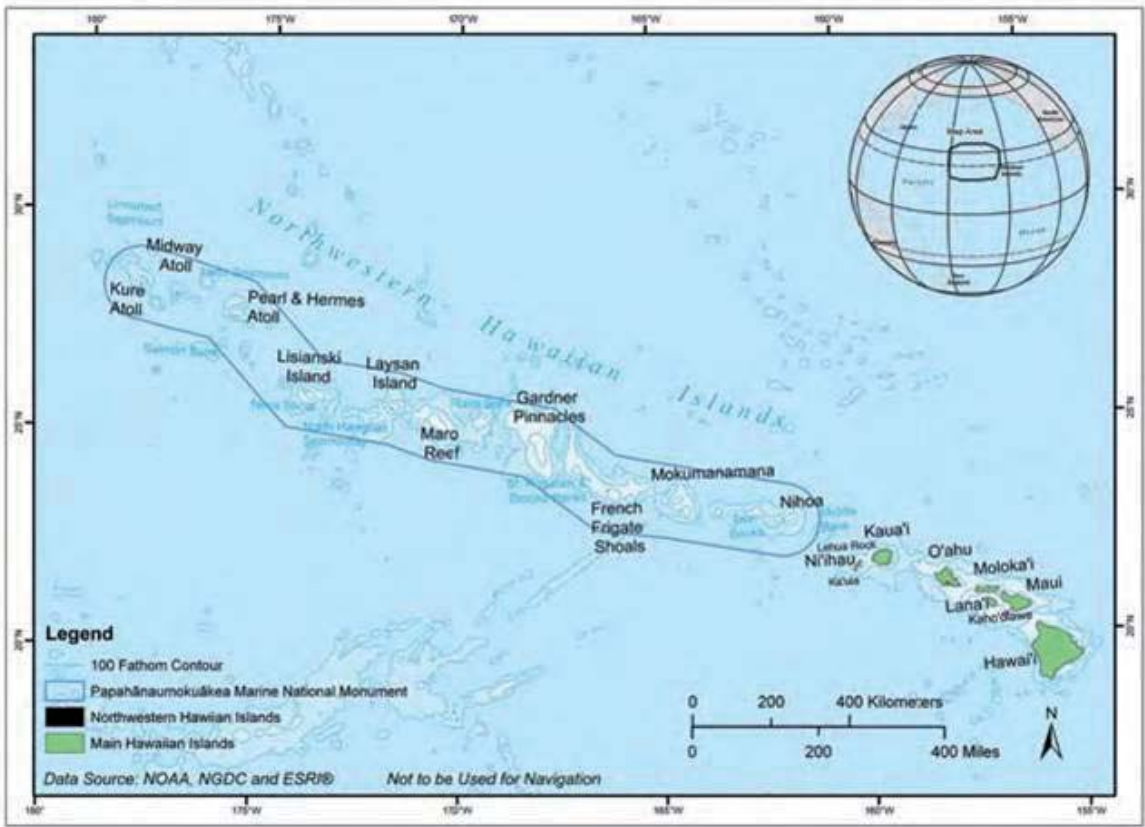
Threats to the property emanating outside its boundaries include marine litter, hazardous cargo, future exploration and mining, military operations, Illegal, Unregulated and Unreported (IUU) fishing, commercial fishing, anchor damage, vessel strikes and Invasive Alien Species.

4. Commends the State Party on the on-going comprehensive management efforts and encourages the State Party to continue and intensify efforts to address the threats to the property emanating outside its boundaries, including marine litter, hazardous cargo, future exploration and mining, military operations, Illegal, Unregulated and Unreported (IUU) fishing, commercial fishing, anchor damage, vessel strikes and Invasive Alien Species, through consultation, collaboration and development and implementation of appropriate strategies nationally and, as possible, internationally;
5. Also commends the State Party on the development of a consultation process between the Monument Management Board and the Department of Defense, encourages the State Party to further investigate opportunities for improved information sharing and coordination with the military in support of management efforts and urges the State Party to ensure that the military presence will not in any way affect the Outstanding Universal Value and the integrity of the property;
6. Recommends that research and awareness-raising should consider the geological linkages with the Hawaii Volcanoes National Park and World Heritage property;
7. Recommends that the State Party, through the co-trustee agencies and the Monument Management Board and in consultation and collaboration with relevant institutions and stakeholder groups, develop a response plans for the property related to climate change, in order to harmonize existing

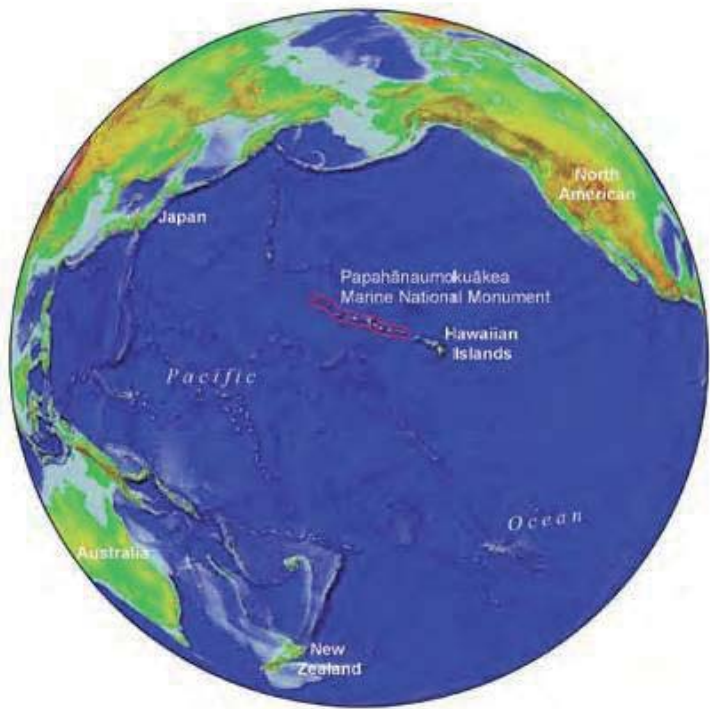
agency plans and activities in a coherent framework that can further strengthen conservation and management efforts as well as generate information of importance beyond the property itself;

8. Welcomes the sister site agreement between the Governments of the United States of America and Kiribati on the management of PMNM and Phoenix Islands Protected Area respectively, and encourages State Parties to continue and, as possible, expand on this collaboration.

Map 1: Papahānaumokuākea Marine National Monument. Overview of the nominated area.



Map 2: Location of Papahānaumokuākea Marine National Monument.



B. Mixed Properties

B2 Boundary Modifications of Mixed Properties

ASIA / PACIFIC

TASMANIAN WILDERNESS

AUSTRALIA



WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

TASMANIAN WILDERNESS (AUSTRALIA) - ID N° 181 Bis

1. BACKGROUND INFORMATION

The Tasmanian Wilderness, Australia, is a mixed property. Initially inscribed on the World Heritage List in 1982, the property was subsequently extended in 1989 to its current extent of 1,383,640 ha. The Committee approved the extension and noted that there were some small enclaves of publicly-owned land with World Heritage values currently excluded from the nomination and expressed the hope that these could be added in the future.

In 2008, a joint World Heritage Centre/IUCN/ICOMOS reactive monitoring mission visited the property and noted that there are currently 21 formal reserves, mainly to the north and east of the property, which are adjacent to the property and covered by its management plan. It recommended that these areas be added to the property as a boundary modification. In decision 32 COM 7B.41, the Committee subsequently requested Australia, inter alia, to: "Submit a proposal for modifying the boundaries of the Tasmanian Wilderness to include the adjacent 21 areas of national parks and state reserves, which are currently not a part of the inscribed World Heritage property but are covered by its management plan."

2. SUMMARY OF PROPOSED BOUNDARY MODIFICATION

In response to the Committee's request, Australia provided a proposal for modifying the boundaries of the Tasmanian Wilderness which adds a total of 23,873 ha. A map of the proposal is provided which, whilst of small scale shows clearly the areas to be added. The 21 areas include two small areas that were added to the Southwest National Park (south of Hartz Mountains [the 'Hartz hole'] and south-east of Cockle Creek) in June 1991. Another two small areas were included in the Franklin–Gordon Wild Rivers National Park, one in the vicinity of the Navarre Plains, the other in the Beech Creek area in January 1992 and August 1991 respectively. Two further small areas at Lees Paddocks in the Mersey Valley were added in 1991. In December 1998 the Regional Forest Agreement (Land Classification) Act 1998 received Royal Assent. On commencement of the Act a further 15 areas (one area of State Reserve and 14 National Park additions) were declared to be reserved land. All 21 areas are within the area covered by the Tasmanian Wilderness Management Plan 1999 and are managed in accordance with this plan.

Natural values of the Tasmanian Wilderness that are considered by the State Party to be expressed in these 21 areas include: temperate rainforests, alpine and subalpine flora and buttongrass moorland, habitat for threatened flora and fauna species, such as the Tasmanian wedge-tailed eagle, geological values, particularly karst landscapes, and aesthetic values.

The 2008 mission also visited the Southwest Conservation Area south of Melaleuca to Cox

Bight. The mission recommended that this area should be incorporated into the World Heritage property as soon as the existing leases expire and that renewal or granting of any new leases should not be considered. This recommendation was also adopted by the World Heritage Committee in Quebec City, in Decision 32COM 7B.41, as noted above. Australia considers it appropriate to resolve the existing mining lease (Rallinga 20M/1992) before the Southwest Conservation Area south of Melaleuca to Cox Bight is incorporated into the property.

3. IMPACT ON OUTSTANDING UNIVERSAL VALUE

IUCN has evaluated the impact of the proposed minor modification in relation to natural values. As Tasmanian Wilderness is a mixed property, an evaluation in relation to cultural values will be carried out by ICOMOS. IUCN notes that the areas proposed for inclusion in the Tasmanian Wilderness add to the integrity of the property and the representation of existing values. The proposal has been clearly requested by the World Heritage Committee. The areas are small reserves that are all adjacent to the western boundaries of the property. The changes are minor in relation to the overall size of the property and are appropriate for consideration as a minor boundary modification. The additions appear to rationalize slightly the boundary in some areas, by filling in some small gaps created by the current configuration of the boundary.

The 21 formal reserves outside the Tasmanian Wilderness but covered by the Tasmanian

Wilderness Management Plan (20,063 hectares) also are accommodated within the same protection and management regime as the inscribed property. They are covered by the same management plan as the existing property. IUCN notes that the existing property has been subject to a number of decisions related to its State of Conservation, which include concerns regarding the management of threats to the property from adjacent forestry areas. Management of these issues in the area surrounding the property should also therefore take account of these decisions, which are equally relevant to the modified boundary of the property.

IUCN considers that the State Party proposal related to the Conservation Area south of Melaleuca to Cox Bight is reasonable, and looks forward to this area being proposed for addition to the property when the mining leases have been resolved.

4. OTHER COMMENTS

IUCN notes that there are additional boundary issues regarding this property, which have been discussed in previous State of Conservation reports and related decisions. IUCN noted its position at the 32nd Session of the Committee that the current eastern boundary of the property is not ecologically based and represents a past compromise between different opinions and views. In the opinion of IUCN the boundary as currently established, whilst functional to date, is not ideal or consistent with current best practice for boundary demarcation for World Heritage properties.

IUCN has consistently noted that there are areas of Old Growth Eucalyptus Forest adjoining the existing World Heritage property which have potential as to be added to the property. The 2008 mission received new information on the values of these adjoining areas adjacent to the property in a detailed report from Environmental NGOs, which suggested the ecological diversity of the tall eucalypt ecosystem is incompletely represented in the World Heritage area, and, in particular, that only 29% of tall eucalypt forest is included within the property. It has also been suggested that the values outside the property are different and complementary to those of the tall eucalypt forest included in the property. Areas of high potential value as World Heritage have consistently been identified, including tall eucalypt forests in the Styx Valley and the Upper Florentine. In this context, IUCN considers the proposed extension involving the 21 new additions may not necessarily reflect the most important areas of tall eucalypt forest outside of the existing boundary of the property, and thus the potential for consideration of the addition of further areas remains. IUCN notes that this issue has been considered in previous decisions of the Committee and the matter is one for the continued

consideration of the State Party, considering the guidance that has been given by the Committee in decision 32COM 7B.41.

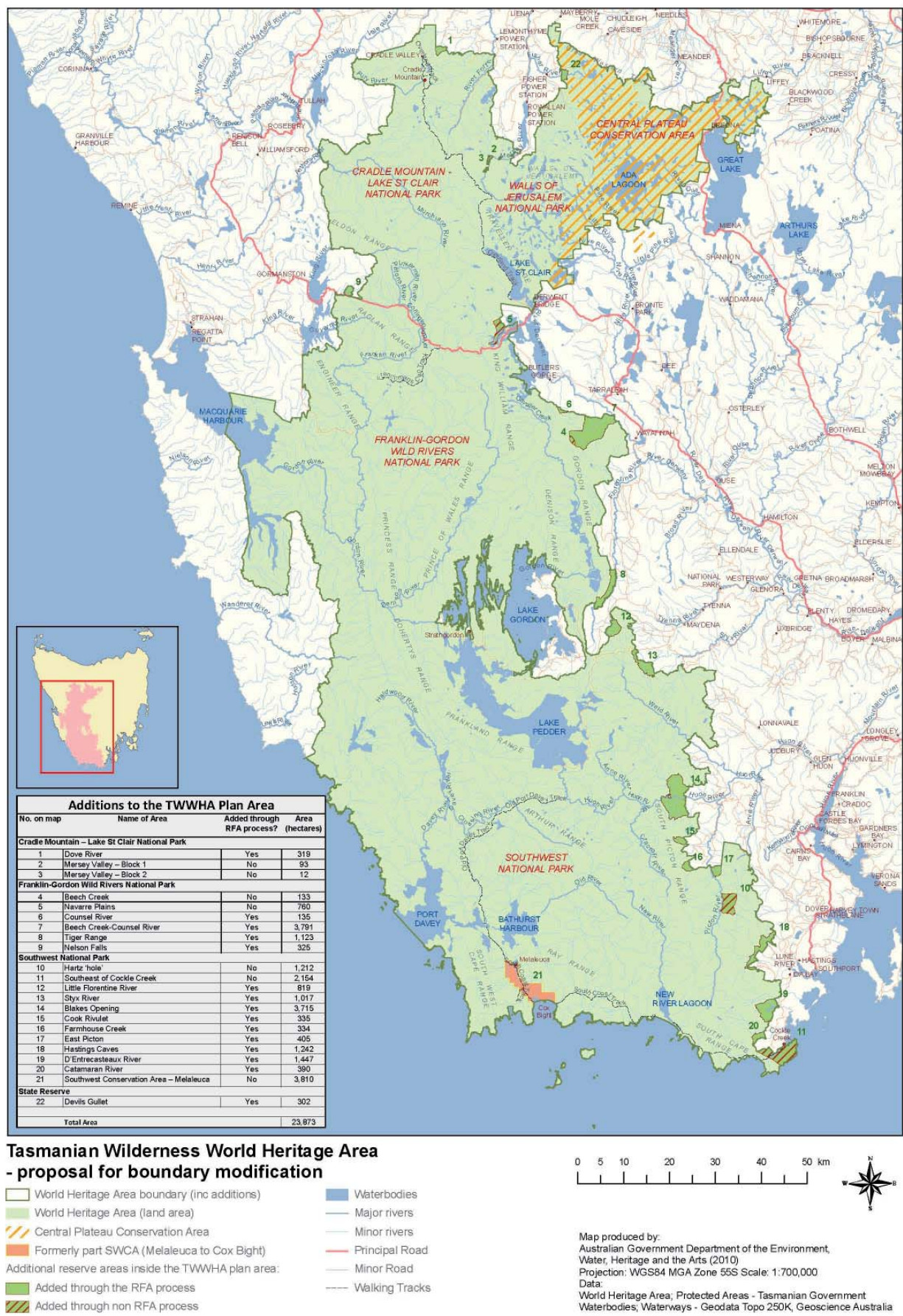
5. RECOMMENDATION

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

The World Heritage Committee,

1. Having examined Documents **WHC-10/34.COM/8B** and **WHC-10/34.COM/INF 8B2**,
2. Approves the minor modification of the boundaries of the property **Tasmanian Wilderness, Australia**, in line with the proposals of the State Party, and as previously requested by the World Heritage Committee;
3. Welcomes the intention of the State Party to add the Southwest Conservation Area south of Melaleuca to Cox Bight to the property when mining licenses have expired;
4. Requests the State Party to ensure that the protection and management of the property within its modified boundaries takes account of past decisions of the World Heritage Committee regarding the State of Conservation of the existing property, including the management of threats in the areas adjoining its boundaries.

Map 1: Boundaries of the property and proposed modification



C. Cultural Landscapes

C1 New Nominations of Cultural Landscapes

AFRICA

KONSO CULTURAL LANDSCAPE

ETHIOPIA

WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

KONSO CULTURAL LANDSCAPE (ETHIOPIA) - ID N° 1333

IUCN considered this nomination based on desk reviews, panel review and the comments of one reviewer. It provided the following comments to the ICOMOS World Heritage Panel.

- a) The nomination document provides a clear rationale for nomination of this property as a cultural landscape, as a “combined work of man and nature”. The nomination emphasises how, for hundreds of years, the Konso people have harness a difficult environment through an agricultural system characterized by extensive dry stone terraces. IUCN notes that there are other similar sites in the region, and in other settings worldwide, which also demonstrate this type of relationship. Furthermore, the nomination document does not provide a detailed comparison of the proposed property with existing World Heritage cultural landscapes and other cultural landscapes worldwide.

The implementation of a reforestation programme, initially for firewood, should be a priority in the property. Protecting the last remnant natural forests and restoring them is more difficult, but should be attempted in order to retain natural values within the landscape. In an already dry environment, climate change is a threat to the values of the landscape and mitigation and adaptation measures should be important components of site management.
- b) The nomination document does not clearly explain the criteria that were used to select the area to be defined as the nominated property. The proposed boundaries, in a number of parts of the nominated property follow straight lines. Since the property includes important values related to the management of water, it appears unlikely that straight line boundaries, which will not follow the key natural features of the landscape, would be the most appropriate or effective means to delimit the nominated property. IUCN recommends that the boundaries be reconsidered to include the upper watersheds that feed the irrigation systems.

The basis for protection of the area is customary law. IUCN questions whether this will be sufficient to guarantee the protection of the nominated property, especially the natural values, over time. It is also of concern that the management plan for the site does not carry legal weight and may not be entirely consistent with customary law. It is recommended that these points are checked by ICOMOS.
- c) The natural values of the landscape have been heavily degraded and little is left of the original vegetation across much of the area. The sacred forests, which provide some protection to forest remnants, continue to be degraded and cut down. These forests, while small, preserve some natural values, as well as having sacred significance in a number of cases. There has been replacement of some species with exotic Eucalyptus which is reported to exacerbate problems of water management.
- d) IUCN notes that the file contains a number of inconsistencies, which make it difficult to pinpoint with precision a number of aspects, including in relation to the plans for management of the property. IUCN would be pleased to review further information if clarifications of the nomination are provided to ICOMOS.

EUROPE / NORTH AMERICA

RØROS MINING TOWN AND THE CIRCUMFERENCE

NORWAY

WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

RØROS MINING TOWN AND CIRCUMFERENCE (NORWAY) - ID N° 55bis

IUCN considered the nomination of this cultural landscape property based on desk reviews and the comments of three external reviewers, and provided the following comments to the ICOMOS World Heritage Panel.

- a) The nominated property does not display intrinsic natural values of international significance and much of the naturalness of this property has been lost, or at least the natural features and values are at relatively low levels of intrinsic significance.
- b) The main natural values, including uplands and lakes, of the area appear to be included in the buffer zone, rather than within the boundaries of the nominated property, or lie more widely outside the buffer zone. The nomination notes that the forests were depleted within 50 years of establishment of the copper mining in the area, pollution and grazing prevented the forests from growing back and Røros was left in a deforested landscape. Forest regeneration is now taking place.
- c) The buffer zone includes parts of Femundsmarka National Park and Forollhogna National Park, which are of importance for biodiversity conservation. The former is home to bear, wolverine, lynx and rare bird species such as golden eagle and osprey. The latter park connects to adjoining protected areas in Sweden and supports low alpine vegetation rich in heather and willows, and provides important reindeer habitat, supporting the only remaining reindeer populations in Europe. Thus in terms of the definition of cultural landscape in the World Heritage Convention, as a “combined work of man and nature”, ICOMOS may wish to consider to what extent the landscape presented is such a cultural landscape, and to what extent it is essentially a mining landscape, where natural values have largely been subsumed beneath human use. A second issue ICOMOS may wish to consider is whether there are key features related to the interaction of man and nature that are located in the buffer zone of the property, rather than the area nominated for inscription.
- d. One key issue that is not referred to adequately in the nomination is the management required to mitigate mining related pollution from heavy metals, and from acid mine drainage. Some remediation work to cover waste material has been attempted, whereas elsewhere the preservation of cultural heritage features is reported to have been prioritized in relation to the implementation of measures to reduce pollution. The nomination notes that the variety of methods to prevent pollution is an interest of the property, but does not clearly state what the present and future imperatives to reduce pollution further would be. There is thus a tension between the presence of the testimony of mining, and the need for continued interventions to reduce the impacts of mining pollution. The solution of the State Party to this issue is an important issue for ICOMOS to consider in its evaluation.
- e. IUCN reviewers noted the positive nature of a number of aspects of the nomination and the work of the State Party in relation to the nominated property and its buffer zone.
 - The significant investment in engaging with stakeholders and communities, resulting in a high level of reported support for the stewardship approaches proposed.
 - The provision of special funding to support the necessary land use systems and traditional farming practices. The provision of financial support to grazing regimes of the summer grasslands and therefore to safeguard them from abandonment is an important aspect of maintenance of the values of the property, and the long term commitment to provide this support should be clarified.
 - The measures to be adopted in relation to the intended management of the property appear to be comprehensive and operationally sound, in relation to the reported natural values within the nominated property.

EUROPE / NORTH AMERICA

DARWIN'S LANDSCAPE LABORATORY

UNITED KINGDOM

WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

DARWIN'S LANDSCAPE LABORATORY (UNITED KINGDOM) - ID N° 1247

IUCN joined the ICOMOS evaluation mission in relation to the nomination of this site. The IUCN expert's report, together with input of 3 desk reviewers, and the input of the IUCN World Heritage Panel, provides the background to the following input. IUCN responded to questions that were posed by ICOMOS and also noted a number of additional comments.

ICOMOS posed three questions in relation to this site. These questions and IUCN's answers follow:

Question 1: IUCN's view on the importance of Darwin's concepts.

Answer: The importance of Darwin's ideas to humanity cannot be overstated – they are fundamental to our understanding of the natural world and are of universal relevance especially the origin of species by natural selection (evolution); the diversity of life as a fundamental principle of the natural world (biodiversity); and the interdependence of all life (ecology). The ramifications of these ideas have been significant with respect to science, religion, politics, and social movements, and are still provocative and relevant today. Beyond ICOMOS's question lies the assessment of the significance of Down House to the development of these ideas, including the association with a particular place or places. Whilst this assessment is the role of ICOMOS, IUCN notes that Darwin lived at Down House from 1842 to 1883, which is throughout the period of his great writings (including the publication of "On the Origin of Species" in 1859).

Question 2: Can we compare quantitatively the species composition of the gardens and forest with respect to Darwin's time and today?

Answer: In part, yes. All but three of the plants that Darwin recorded can be found within the property today, and one of those currently missing is being reintroduced. However, it is not possible to compare all species, because we do not have complete baseline data from Darwin's time, but we do have an inventory of the species found on the site today.

Question 3: Are there species of vegetation or garden plots that can be linked to specific aspects of Darwin's theories and writing?

Answer: All the habitats studied by Darwin are still evident and many of Darwin's experiments could be repeated today. It is possible to compare the natural values of specific locations of the rural landscape, and there are many where the wildlife and plants that Darwin studied are still present such as Great Pucklands Meadow, The Downe Valley,

Cudham School Pond, Keston Common, Estates, The Cudham Valley, and Downe Bank. The grounds of Down House also contain many original features present during Darwin's presence at Down such as: The Flower Garden, Orchard, Kitchen Garden, Greenhouse, Garden Laboratory, Great House Meadow, and Sand-Walk Copse. IUCN suggests that it would be useful to request that these sites be mapped to show where specific experiments were undertaken. Thus there are tangible natural attributes that can be directly related to the interaction of Darwin with the landscape in which he lived.

In addition to these points, IUCN considers that the protection and management of the property and its buffer zone are adequate to the maintenance of the natural values identified as significant in the nomination, and thus from the point of view of natural values integrity is met. A number of points are noted that could lead to the strengthening of the protection and management of the property:

- The London Borough of Bromley (LBB) should seek agreements with the private owners within the property to promote continued conservation of the natural attributes of the landscape, and should encourage an extension of ownership to support conservation by either public bodies or appropriate NGOs ownership so as to protect the values of the property in perpetuity.
- If inscribed, new planning powers given to local authorities in the UK to protect World Heritage sites should be used by the LBB to protect the values and attributes of the property.
- There is a potential to improve environmental conditions at Downe, especially with respect to the management of car parking and traffic and the impacts of a power line that cuts across the north of the nominated property.
- The important education and interpretation programmes delivered at Down House should be expanded and apply to the landscape as a whole as well as to the house and garden.

LATIN AMERICA / CARIBBEAN

PREHISTORIC CAVES OF YAGUL AND MITLA IN THE CENTRAL VALLEY OF OAXACA

MEXICO

WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

PREHISTORIC CAVES OF YAGUL AND MITLA IN THE CENTRAL VALLEY OF OAXACA (MEXICO) - ID Nº 1352

IUCN carried out a desk and panel review of this nomination and presented the following comments to the ICOMOS World Heritage Panel. IUCN considered that the nomination did not articulate a convincing case for recognition as a cultural landscape from a natural landscape perspective.

IUCN noted that while the nominated property provides important archaeological evidence of the evolution of man's relationship with nature through the early domestication of plants, such as corn, the present landscape itself is not particularly significant in regard to a contemporary interaction of man and nature.

The area proposed for inscription is mainly dedicated to intensive agriculture and grazing. The more natural landscapes are in the buffer zone on the northern side of the property where a small ecological reserve is proposed to protect a watershed characterized by springs, intermittent streams, and a low lying deciduous forest. The natural values of the area appear to be of local or national significance. It is noted, however, that this portion of the nominated property serves to buffer the larger area from extreme weather events and to protect aesthetic values. The nomination provides little information on the integrity of the site, except to note the progressive encroachment of the urban periphery on the agricultural components of the site.

C. Cultural Landscapes

C2 Renominations of Natural Properties under Cultural Criteria

AFRICA

NGORONGORO CONSERVATION AREA

TANZANIA

WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

NGORONGORO CONSERVATION AREA (TANZANIA) - ID N° 39bis

The Ngorongoro Conservation Area (NCA) was inscribed on the World Heritage list in 1979 as a natural property under all four natural criteria. It has been re-nominated as a mixed site under additional criteria of (iii), and (iv), for consideration at the 34th Session of the Committee. IUCN joined ICOMOS for its evaluation mission in relation to this renomination. The following comments take into account the findings of the IUCN expert on this mission, comments from five external reviewers, internal desk review, and consideration of the IUCN World Heritage Panel. IUCN provided the following comments to ICOMOS as an input to their evaluation process, and in the event ICOMOS consider inscription under cultural values, IUCN considers these issues should be addressed in framing the recommended Committee decision, the revised Statement of Outstanding Universal Value, and any proposals related to the protection and management of the property.

1. UNADDRESSED ISSUES WITH RESPECT TO CURRENT MANAGEMENT

IUCN notes with concern that many recommendations that have resulted from reactive monitoring missions to the property undertaken in 2007 and 2008 have not been implemented. Indeed, it is considered that if these recommendations are not implemented there is a danger of degrading or losing the natural values that were the reason for its inscription on the World Heritage List. Above all, there is an urgent need to reconcile the conservation of the area's outstanding universal value in relation to natural values, with the demands for development and the rapidly expanding population within the property. The issues of concern are identified in the relevant State of Conservation Reports that have been made to the World Heritage Committee, including accompanying missions were relevant.

IUCN is concerned that the new nomination makes little mention of these issues. Despite the fact that the evaluation of the renomination is required to be made only in relation to cultural values (according to the Operational Guidelines), it would have been desirable for the renomination document to have clearly set out the existing natural values of the property, and also outline the ways in which the protection and management of the property would need to be adapted to take account of the possible recognition of the cultural values of the property. IUCN considers that the renomination of the the property could provide an opportunity to address the above issues, however this appears to be unlikely given the present state of the nomination document.

2. MAASAI PASTORALISM

The Maasai have lived in the NCA for the last few centuries. Maasai traditional culture values living in harmony with the wildlife. They are not unique in this sense, but this is an important aspect of their

heritage. The lifestyle of the Maasai is also under pressure of change. Adoption of settled agriculture and difficulties in maintaining a nomadic lifestyle are a clear reality for the Maasai communities living in Ngorongoro. The absolute numbers of people living in the crater is also a key issue, as noted above.

The nomination document notes the interaction of the Maasai with the landscape of Ngorongoro, but this appears to be very much a secondary consideration, relative to the palaeontological sites related to human evolution.

Reviewers noted that there is little or no information presented in the nomination regarding consultation with the Maasai as key stakeholder in Ngorongoro. It is suggested important to confirm that the nomination was prepared with free prior and informed consent from the Maasai. ICOMOS should also consider how the Maasai are represented with respect to management of the NCA, and whether this is credible and effective.

Reviewers also note the potential importance of the indigenous knowledge of the Maasai to help inform strategies for adaptation to climate change, for example with respect the human and animal migratory systems, use of different altitudes for livestock, changing stock density during droughts, systems of animal husbandry and traditional medicine.

Reviewers also note that there is a UNESCO backed programme on cultural landscape mapping and modern techniques for community based ethnobiological surveys, and noted that this should be used to help inform management decisions.

3. GOVERNANCE

Governance appears to be a central issue with respect to the nomination. The renomination

provides an opportunity to reconsider governance arrangements, but this is not covered in the nomination document. IUCN considers a central focus should be to ensure that the management body has the capacity, skills and resources to fulfil its role effectively. This role would potentially be redefined by the renomination of the property. The renomination, if accepted, would introduce new requirements for management of the property, in relation to the increased consideration of its cultural values. IUCN considers that a fully integrated management system would be required to ensure that there is an effective overall approach to the management of the property. This would need to consider natural and cultural aspects, and the interaction between them. Protection of the natural values of the property should continue to be a central objective in the management system for the property if recognized as a mixed site.

The role of the Maasai is also significant in this regard. If, as the renomination states, “the living culture of the Maasai communities identified with the nominated property is of an outstanding significance for effective conservation”, then it would seem essential to establish a co-management governance regime with the NCA, the Department of Antiquities, and the resident Maasai community. These should deal transparently and equitably with land right and tenure issues, and also be capable of resolving disputes. In addition, there will be a need for community training so can participate effectively in governance.

IUCN requests that ICOMOS discuss any proposed advice on protection and management of the property with IUCN, prior to finalizing this advice to the World Heritage Committee. IUCN suggest that this would be valuable, in order to seek to ensure the maximum coordination of guidance on the management of the cultural values of the property, with aspects relevant to the existing recognised natural values of the property.

4. INTEGRATION INTO THE LARGER LANDSCAPE

There is also little mention in the renomination file of how the management of the NCA could be integrated into the broader regional context. The economic and sustainability issues surrounding Ngorongoro have not been discussed adequately nor is there mention of opportunity to address wider issues through the Serengeti Ecosystem Forum. It would appear that there is the need to consider a buffer zone in the south-east where heaviest population pressure is near Karatu.

5. RECOGNITION OF FOSSIL VALUES, USE OF CRITERION (VIII)

IUCN notes that there is an option to suggest that the fossil values of the property could be recognized, wholly or in part, under the existing natural criterion viii, as was the case in relation to the recognition of such values in the 1997 inscription of Lake Turkana National Parks (Kenya). This option could be discussed with IUCN if it was felt appropriate for further consideration.

6. MANAGEMENT EFFECTIVENESS

Given the complexity of management of this property, and the large number of existing issues regarding its conservation and effective management, IUCN notes that it would be highly desirable to undertake an evaluation of management effectiveness of the property, taking account its existing conservation issues, in the context of the renomination. IUCN notes that the World Heritage Committee has recently agreed to provide International Assistance for such an assessment in Ngorongoro, and suggests that the State Party carefully consider the brief for this study to ensure that it contributes to addressing any issues raised by the ICOMOS evaluation, as well as the existing, well known issues of management effectiveness facing the property.

7. RECOMMENDATIONS

It is the responsibility of ICOMOS in this case to assess whether or not the re-nominated property should be recommended for inscription on the World Heritage List under cultural criteria, and which of the cultural values of Ngorongoro could be considered as being of Outstanding Universal Value. On the basis of its review, IUCN suggests that ICOMOS may wish to consider whether the outstanding issues regarding the integrity, protection and management issues facing the property mean that the time is right for the inscription of the property in relation to cultural values. As noted above, IUCN would also welcome the opportunity to discuss the draft conclusions of ICOMOS regarding the integrity, protection and management of the property. IUCN suggests it would be important for IUCN and ICOMOS to coordinate advice to the Committee and the State Party to ensure that the renomination leads to the best possible conservation of Ngorongoro (including addressing existing issues), promotes the effective management of the property, and leads to equitable benefits to all stakeholders.