



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



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**IUCN World Heritage Evaluations 2014**



United Nations  
Educational, Scientific and  
Cultural Organization



World Heritage Convention



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

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OUTSTANDING UNIVERSAL VALUE																
State Party	Name of the property (ID number)	Note	Meets one or more natural criteria				Meets conditions of integrity				Meets protection and management requirements			Further mission required	IUCN Recommendation	
			Criterion (vii)	Criterion (viii)	Criterion (ix)	Criterion (x)	Integrity	Boundaries	Threats addressed	Justification of serial approach	Protection status	Management	Buffer zone/ Protection in surrounding area			
			77	77	77	77	78, 87-95	99-102	78, 98	137	78, 1324	78, 108-118, 1324, 135	103-107			
Paragraphs of the Operational Guidelines for the Implementation of the World Heritage Convention																
Botswana	Okavango Delta (1432)		yes	-	yes	yes	yes	yes	part	-	yes	yes	yes	no	I	
China	South China Karst (Phase II) (1248 Bis)	Extension	yes	yes	-	-	yes	yes	yes	yes	yes	yes	yes	no	I	
Viet Nam	Cat Ba Archipelago (1451)		-	-	no	no	no	no	part	-	yes	no	part	no	NI	
Denmark/ Germany	Wadden Sea (1314 Ter)	Extension	-	yes	yes	yes	yes	yes	yes	-	yes	yes	-	no	I	
Denmark	Stevns Klint (1416)		-	yes	-	-	yes	yes	part	yes	yes	yes	yes	no	I	
France	Chaine des Puy's and Limagne Fault (1434)		no	no	-	-	no	no	no	-	no	part	no	no	NI	

**OUTSTANDING UNIVERSAL VALUE**

State Party	Name of the property (ID number)	Note	Meets one or more natural criteria				Meets conditions of integrity				Meets protection and management requirements			Further mission required	IUCN Recommendation
			Criterion (vii)	Criterion (viii)	Criterion (ix)	Criterion (x)	Integrity	Boundaries	Threats addressed	Justification of serial approach	Protection status	Management	Buffer zone/ Protection in surrounding area		
			77	77	77	77	78, 87-95	99-102	78, 98	137	78, 132, 4	78, 108-118, 132, 4, 135	103-107		
Paragraphs of the Operational Guidelines for the Implementation of the World Heritage Convention															
Poland/ Belarus	Bialowieza Forest (33 Ter)	Extension Renomination	-	-	yes	yes	yes	yes	part	-	part	part	yes	no	I
Viet Nam	Trang An Landscape Complex (1438)	Mixed site	part	part	-	-	part	part	part	-	no	part	no	yes	D
Portugal	Arrábida (1454)	Mixed site	no	no	no	no	no	no	no	-	no	no	no	no	N I
Mexico	Ancient Maya City and Protected Tropical Forests of Calakmul, Campeche (1061 Bis)	Extension Renomination Mixed site	-	-	part	part	part	no	part	-	part	no	part	yes	D

**KEYS**

yes met  
 part partially met  
 no not met  
 - not applicable

I inscribe / approve  
 N I non inscribe  
 R refer  
 D defer

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Denmark	1416	Stevns Klint	53
France	1434	Tectono-volcanic Ensemble of the Chaîne des Puys and Limagne Fault	65
India	1406 Rev	Great Himalayan National Park	ADD
Mexico	1061 Bis	Ancient Maya City and Protected Tropical Forests of Calakmul, Campeche (extension and renomination)	111
Philippines	1403 Rev	Mt. Hamiguitan Range Wildlife Sanctuary	ADD
Poland / Belarus	33 Ter	Bialowieza Forest (extension and renomination)	75
Portugal	1454	Arrábida	99
Viet Nam	1451	Cat Ba Archipelago	31
Viet Nam	1438	Trang An Landscape Complex	87

## IUCN FIELD EVALUATORS

Site	Name
Okavango Delta	Peter Howard & Alan Wheeler
South China Karst (Phase II)	Les Molloy & Kyung Sik Woo
Wadden Sea (extension)	Wendy Strahm & Oliver Avramoski
Stevns Klint	Marie-Luise Frey & Andrej Sovinc
Tectono-volcanic Ensemble of the Chaîne des Puys and Limagne Fault	Josephine Langley & Thomas J. Casadevall
Ancient Maya City and Protected Tropical Forests of Calakmul, Campeche (extension and renomination)	Allen Putney
Bialowieza Forest (extension and renomination)	Elena Osipova & Pierre Galland
Arrábida	Tilman Jaeger
Cat Ba Archipelago	Gayatri Reksodihardjo-Lilley & Peter Hitchcock
Trang An Landscape Complex	Graeme Worboys

It should be noted that the IUCN field evaluators are part of a broader evaluation approach detailed in the introduction of this report.



# THE WORLD HERITAGE CONVENTION

## IUCN TECHNICAL EVALUATION REPORT OF WORLD HERITAGE NOMINATIONS

### April 2014

#### 1. INTRODUCTION

This technical evaluation report of natural and mixed properties nominated for inclusion on the World Heritage List has been conducted by the World Heritage Programme of IUCN (International Union for Conservation of Nature). The World Heritage Programme co-ordinates IUCN's input to the World Heritage Convention in close cooperation with the IUCN Global Protected Areas Programme (GPAP) and other units of IUCN both at headquarters and in the regions. 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.

IUCN's evaluations are conducted according to the Operational Guidelines that the World Heritage Committee has agreed, and which are the essential framework for the application of the evaluation process. 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, institutional memory and consistency 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, supported by other specialists where appropriate. The WCPA network now totals more than 1700 protected area managers and specialists from 140 countries. In addition, the World Heritage Programme calls on relevant 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, nongovernmental 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 World Heritage Programme then prepares the final technical evaluation reports which are presented in this document and represent the corporate position of IUCN on World Heritage evaluations. IUCN has also placed emphasis on providing input and support to ICOMOS in relation to those cultural landscapes which have important natural values.

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. This cooperation will be reported in Item 5B and other relevant items of the Committee's agenda.

In 2013-14 IUCN has continued to work on the Upstream Process, as will be debated in the relevant items on the Committee's agenda.

#### 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 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. **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 almost 130 external reviews in relation to the properties examined in 2013 / 2014.

2. **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.
3. **IUCN World Heritage Panel Review.** The Panel intensively reviews the nomination dossiers, field mission reports, comments from external reviewers 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.
4. **UNEP-WCMC Comparative Analysis.** IUCN commissions UNEP-WCMC to carry out a global comparative analysis for all properties nominated under the biodiversity criteria (ix) and (x). These documents are very useful to the Panel review. Following inscription, datasheets are compiled with WCMC.
5. **Communities.** IUCN has enhanced its evaluation processes through the implementation of a series of measures to evaluate stakeholder and rights holder engagement during the nomination process (see below for further details)
6. **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 organizing 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.

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. It should be emphasized that whilst exchanges between evaluators and the State Party during the mission may provide valuable feedback they do not substitute for the formal requests for supplementary information outlined above. In addition IUCN has continued to promote additional dialogue with States Parties on the conclusion of its panel process, to allow for discussion of issues that have been identified and to allow more time to prepare discussions at the World Heritage Committee.

In the technical evaluation of nominated properties, global biogeographic classification systems such as Udvardy's biogeographic provinces and the terrestrial, freshwater and marine ecoregions of the world are used to identify and assess comparable properties at the global level. These methods make comparisons of natural properties more objective and provide 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 these systems are used as a basis for comparison only and do not imply that World Heritage properties are to be selected based on these systems alone. In addition, global conservation priority-setting schemes such as WWF's Global 200 Priority Ecoregions, Conservation International's Biodiversity Hotspots, Birdlife International's Endemic Bird Areas and Important Bird Areas, Alliance for Zero Extinction sites and IUCN/WWF Centres of Plant Diversity provide useful guidance. The decisive principle is that World Heritage properties are only those areas of outstanding universal value. During 2013/14 IUCN has fully updated its global science on World Heritage, including new thematic studies on terrestrial biodiversity, marine world heritage, and the application of criterion (vii). These documents, and other thematic studies and key references are available at the following web address: [http://www.iucn.org/about/work/programmes/wcpa\\_worldheritage/resources/publications/](http://www.iucn.org/about/work/programmes/wcpa_worldheritage/resources/publications/)

The evaluation process is also aided by the publication of a series of reference volumes and thematic studies. In early 2012 a resource manual on the preparation of World Heritage Nominations was published, under joint lead authorship of IUCN and ICOMOS, and has provided further details on best practices, including the key resources that are available to support nominations.

IUCN members adopted a specific resolution on these matters at the IUCN World Conservation Congress in 2012, and this resolution (*WCC-2012-Res-047-EN Implementation of the United Nations Declaration on the Rights of Indigenous Peoples in the context of the UNESCO World Heritage Convention*) is available at the following address: [http://www.iucnworldconservationcongress.org/members\\_assembly/resolutions/](http://www.iucnworldconservationcongress.org/members_assembly/resolutions/). IUCN has continued to implement a range of improved practices within its evaluation process in response to these reviews and reflections, which are focused on the inclusion of a specific section headed “Communities” within each evaluation report, to ensure transparency and consistency of IUCN’s advice to the World Heritage Committee on this important issue. These new measures include a standard screening form for all evaluation missions, additional consultation with networks specialised in this field, and including an expert advisor in the membership of the IUCN World Heritage Panel.

In addition, IUCN has updated its format for field evaluation reports, to include specific questions on communities, and to also clarify a range of questions and expectations of feedback from evaluators to ensure consistency of reports from field missions.

IUCN has also completed an evaluation of its World Heritage Programme, and will prepare a management response to its findings, leading to action to address identified issues. This will include reexamining the role of the IUCN World Heritage Panel. The evaluation is available online at the following address: [https://www.iucn.org/knowledge/monitoring\\_evaluation/database/all\\_iucn\\_evaluations/](https://www.iucn.org/knowledge/monitoring_evaluation/database/all_iucn_evaluations/)

### 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, the UNEP-WCMC Comparative

Analysis, 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:** Membership of the Panel is at the invitation of the IUCN Director General (or Deputy Director General under delegated authority) through the Director of the World Heritage Programme. The members of the Panel comprise IUCN staff with responsibility for IUCN’s World Heritage work, other relevant IUCN staff, Commission members and external experts selected for their high level of experience with the World Heritage Convention. The membership of the Panel comprises:

- The Director, IUCN World Heritage Programme (Chair – non-voting)
- At least one and a maximum of two staff of the IUCN Global Protected Areas Programme
- Senior Advisor(s) appointed by the IUCN Director General or delegate to advise the organisation on World Heritage
- The IUCN World Commission on Protected Areas (WCPA) Vice Chair for World Heritage
- The Head of the UNEP-WCMC Protected Areas Programme
- Up to five technical advisors, invited by IUCN and serving in a personal capacity, with recognised leading expertise and knowledge relevant to IUCN’s work on World Heritage, including particular thematic and/or regional perspectives.

The Panel’s preparations and its meetings are facilitated through the work of the World Heritage Programme Assistant. Information on the members of the IUCN World Heritage Panel is posted online at the following link: [http://www.iucn.org/about/work/programmes/wcpa\\_worldheritage/our\\_work/wcpa\\_nomination/](http://www.iucn.org/about/work/programmes/wcpa_worldheritage/our_work/wcpa_nomination/)

The Deputy Director General, or another senior manager, is delegated by the Director General to provide oversight at senior level on World Heritage, including with the responsibility to ensure that the Panel functions within its TOR and mandate. This senior manager is not a member of the Panel, but is briefed during the Panel meeting on the Panel’s conclusions. The Panel may also be attended by other IUCN staff, Commission members (including the WCPA Chair) and external experts for specific items at the invitation of the Chair.

#### **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. 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 2013 / 2014**

12 nomination dossiers and 2 minor boundary modification were examined by IUCN in the 2013 / 2014 cycle, involving 10 field missions. These comprised:

- 9 natural property nominations (including 4 new nominations, 2 referred nomination and 3 extensions);
- 3 mixed property nominations (including 2 new nominations and 1 extension/renomination), where joint missions were undertaken with ICOMOS;
- 6 cultural landscape nominations (all new nominations); 3 were commented on by IUCN based on internal and external desktop reviews and 3 were not commented on,
- 2 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. In addition collaboration agreements with the International Union of Geological Sciences (IUGS) and the International Association of Geomorphologists (IAG) focus on strengthening the evaluation process by providing access to the global networks of earth scientists coordinated through IUGS and IAG. 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.

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.

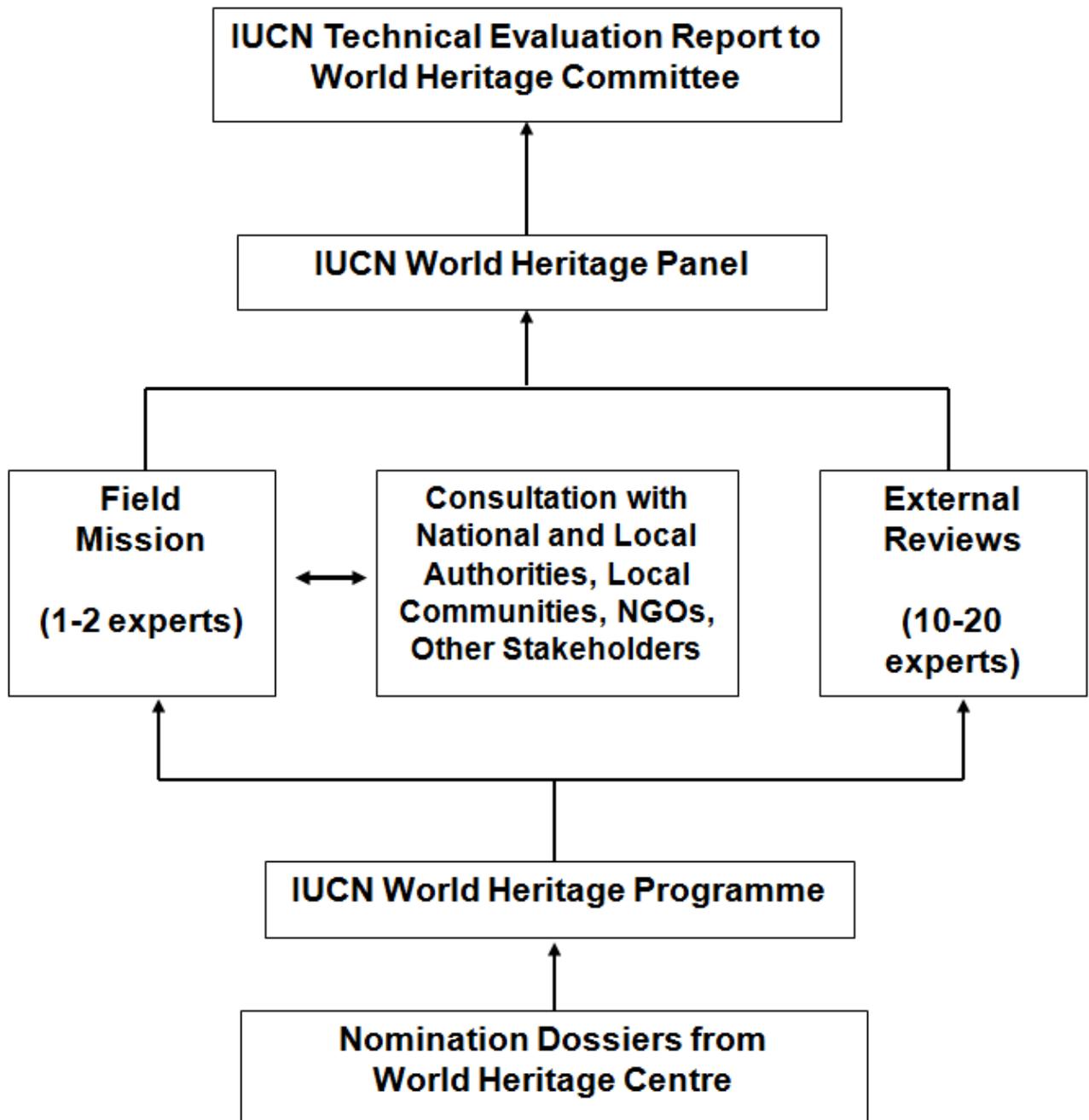
#### **7. RECOMMENDATIONS TO THE WORLD HERITAGE COMMITTEE**

In the 2013 / 2014 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 2014, 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**



**AFRICA**

# **OKAVANGO DELTA**

**BOTSWANA**





# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## OKAVANGO DELTA (BOTSWANA) – ID No. 1432

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** To inscribe the property under natural criteria.

**Key paragraphs of Operational Guidelines:**

Paragraph 77: Nominated property meets natural World Heritage criteria.

Paragraph 78: Nominated property meets conditions of integrity and protection and management requirements.

### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 20 March 2013

**b) Additional information officially requested from and provided by the State Party:** Following the technical evaluation mission the State Party was requested to provide supplementary information on 13 December 2013. The State Party responded on 21 February 2014 providing additional information on a range of issues including the support of the tripartite Permanent Okavango River Basin Water Commission (OKACOM) for the nomination; proposed boundary changes; current mining concessions overlapping the nominated property; cultural heritage and indigenous rights issues; management planning arrangements; hunting; veterinary cordon fences and the status of wildlife populations.

**c) Additional literature consulted:** Various sources, including MacKinnon, J & K (1986). **Review of the Protected Areas System in the Afrotropical Realm.** UNEP/IUCN. Ross, K (2003). **Okavango. Jewel of the Kalahari.** Cape Town: Struik. Mendelsohn, J.M. et al. (2010). **Okavango Delta: Floods of Life.** Windhoek: Raison. Gifford, J (2013). **Botswana's Wildlife Crisis.** Pp 30-36 Geographical magazine (Royal Geographical Society, London), September 2013. UNEP-WCMC website. UNESCO website. Mendelson, J., and el Obied, S., 2004 **Okavango River: The flow of a lifeline.** Struik, Cape Town. Ellery K, Ellery W (1997) **Plants of the Okavango Delta: a field guide.** Tsaro Publ., 225 pages. Ellery WN, Ellery K, McCarthy TS, Cairncross B, Oelofse R (1989) **A peat fire in the Okavango Delta, Botswana, and its importance as an ecosystem process.** African Journal of Ecology 27: 7-21. Liebenberg, P.J. June (2009) **Technical Report on Irrigation Development in the Namibia Section of the Okavango River Basin.** Sebastian, G. Antoinette. (2008) **Transboundary Water Politics: Conflict, Cooperation, and Shadows of the Past in the Okavango and Orange River Basins of Southern Africa.** Ashton, Peter (2000) **Southern African Water Conflicts: Are They Inevitable Or Preventable?** In: Green Cross International. Water for peace in the Middle East and Southern Africa. Green Cross International, Geneva; pp.94-98. H.L.A. Bartlam-Brooks, M.C. Bonyongo and Stephen Harris (2011). **Will**

**reconnecting ecosystems allow long-distance mammal migrations to resume? A case study of a zebra *Equus burchelli* migration in Botswana.** Oryx, 45, pp 210-216. JM Bishop, AJ Leslie, S Bourquin, L Badenhorst, C O'Ryan. 2009. **Overexploitation and the declining effective population size of a top predator.** Biological Conservation, Vol 142, Issue 10: 2335-2341. Cushman, S.A., M.J. Chase and C. Griffin. (2010). **Mapping Landscape resistance to identify corridors and barriers for elephant movement in southern Africa.** In S.A. Cushman and F. Huettmann (Ed.), Spatial Complexity, Informatics, and Wildlife Conservation, (pp. 349-367). Springer Japan. Shacks, V.A. (2006) **Habitat vulnerability of Nile crocodile nesting sites in the Okavango Delta, Botswana.** University of Stellenbosch. MA Thesis. Stankey, G.H.; Cole, D.N.; Lucaas, R.C.; Petersen, M.E.; Frissell, S.S. **The limits of acceptable change (LAC) system for wilderness planning.** General Technical Report – USDA. USDA, Ogden. Forest Service. Ogden (EUA). 1985. 37p. Clausnitzer, V., Koch, R., Dijkstra, K.-D.B., Boudot, J.-P., Kipping, J., Samraoui, B., Samways, M.J., Simaika, J. & Suhling, F. 2012. **Focus on African freshwaters: hotspots of dragonfly diversity and conservation concern.** - Frontiers in Ecology and the Environment (doi:10.1890/110247). Discovery Metals Ltd.16 May, 2013 Profile. Discovery Metals Ltd. 7 June, 2013. Prospecting License Update. Madzuzo, E., HaBarad, J. and F. Matose.2006. **Outcomes of community engagement on community-based natural resource management programmes.** Policy Brief No.22. Program for Land and policy Studies. Magole, L. I. and Magole, L. No Date. **The Okavango: Whose Delta is it?** Unpublished Paper. Mbaiwa, J.E. 2004. **The Success and Sustainability of Community-Based Natural Resource Management in the Okavango Delta, Botswana.** South African Geographical Journal. 86 (1): 44-53.

**d) Consultations:** 16 desk reviews received, and additional consultations held with specialist groups of IUCN Species Survival Commission. The mission also met with the Minister, the Permanent Secretary and the Agriculture Deputy Permanent Secretary of the Ministry of Environment, Wildlife and Tourism; the Permanent Secretary of the Ministry of Education and Skills Development; the Deputy Director, International Waters within the Ministry of Minerals, Energy and Water

Resources, and its Department of Mines; the Kalahari Conservation Society; the Hospitality and Tourism Association of Botswana; the Botswana National Commission for UNESCO; the Kwhai Community; TOCaDi representatives; the Moremi Game Reserve Park Manager; and many other stakeholders.

**e) Field Visit:** Dr Peter Howard and Dr Alan Wheeler, 14-20 October 2013.

**f) Date of IUCN approval of this report:** March 2014

## 2. SUMMARY OF NATURAL VALUES

The nominated property, known as the Okavango Delta, is situated in north-western Botswana. It is a vast inland delta created by seismic activity approximately 40,000 years ago and lying near the centre (and at the lowest point) of the extensive sand-filled Kalahari Basin. The delta comprises a fan-shaped plain of alluvial sediments with approximately 600,000 hectares (ha) of permanent swamps and an additional 700,000 to 1.2m ha of seasonally flooded grasslands. Its waters originate in the southern Angolan highlands as two rivers, the Cuito and Cubango, before flowing briefly through Namibia's "Caprivi Strip" (renamed by Namibia in 2013 as the Zambezi Region of Namibia) and entering Botswana. The Okavango is Southern Africa's third largest river, traversing a distance of 1,500 km before it disappears into the Kalahari sands.

The Okavango Delta is one of a very few large inland delta systems without an outlet to the sea, its waters draining instead into the desert sands of the Kalahari Basin. A unique attribute of this system is that the annual flooding event occurs in the dry season, so plants and animals have adapted their life-cycles to synchronize with the floods, as well as the annual rains. The ecological and biological processes that define the Okavango system provide an outstanding and extraordinary example of the complex inter-relatedness, inter-dependence, and interplay of climatic, geomorphological, hydrological, and biological phenomena. All these processes in combination have resulted in the creation of a unique complex of terrestrial and aquatic habitats, with a correspondingly diverse complement of plant and animal species.

The State Party, in its supplementary information of February 2014, has amended the boundaries of the property which now comprises a nominated area of 2,023,590 ha with a buffer zone of 2,286,630 ha which is outside of the nominated property.

The Okavango Delta is a natural oasis in which the perennial cycle of flooding activity continually maintains and shapes the ecosystem. It includes extensive areas of perennial swamps, ever-changing river channels, lagoons and seasonal pans as well as islands, seasonally flooded grasslands, riverine forests and dry deciduous woodlands. Within this complex mosaic of

wetlands and other habitats live substantial populations of Africa's charismatic large mammals such as Elephant, Buffalo, Rhinoceros, Lion, Leopard, Wild Dog and Cheetah. Species lists indicate a total of 130 species of mammals within the property as well as 482 birds, 64 reptiles, 33 amphibians, 90 freshwater fish, 155 butterflies, 94 dragon and damselflies, 22 mollusks and 1068 plant species. These lists include significant numbers of rare and endangered species. Although the Okavango Delta has few endemic species, it is notable for the size of the populations of key species and the opportunity to maintain the complex ecological interactions that can only be sustained in the long term within a naturally-functioning system of this size.

The Okavango Delta system provides vital ecosystem services, and is an important source of fresh water in an otherwise arid region. The Okavango Delta System is also one of the largest Ramsar sites, designated in 1996. The Delta supports the livelihoods of approximately 130,000 local people, most of who depend on its resources for building materials, food and medicines. A significant proportion of the local community also derives employment through a thriving eco-tourism industry and its associated services.

## 3. COMPARISONS WITH OTHER AREAS

The Okavango Delta has been nominated under natural criteria (vii), (ix) and (x). The nomination dossier includes a comparative analysis which notes the unique qualities of the Okavango Delta and the challenge of finding directly comparable sites. Nevertheless the nominated property is compared against six several similar wetland systems in South America, Europe, Asia and Africa. Comparisons have been made against the Pantanal, the world's largest wetland spanning the three countries of Brazil, Paraguay and Bolivia; Llanos in Venezuela; the Danube Delta Biosphere Reserve shared between Romania and Ukraine; the Mesopotamia Marshes in Iraq; and the Niger Delta in Mali and Sudd Wetlands in Sudan both on the African continent. The comparative analysis is succinct but well argued in terms of the distinctive nature of the Okavango Delta when compared with other wetland systems. Several other integrity, threats, protection and management considerations have also been highlighted to distinguish the nominated property from other sites. The analysis concludes that the nominated property stands out globally in terms of its aesthetics, natural processes and phenomena. The analysis further argues Okavango's distinctiveness based on its higher species concentrations and habitat diversity within a large, well protected system.

Additional comparative analysis which supplements that of the nomination has been undertaken by UNEP-WCMC and IUCN. This notes that the nominated property, as one of the world's largest Ramsar sites, is hydrologically unique and is the only mega inland delta in sub-Saharan Africa. The area is subject to large fluctuations in flooded area, and the floodplains form

critical habitats for many species of birds and other wildlife at the southern limits of their distribution in the region.

With respect to criterion (ix) the Okavango Delta and associated flooded grasslands and savannah habitats are widely recognized as some of the most important biological sites in Africa. Although the Okavango Delta does not represent ecosystems or communities that are currently not represented on the World Heritage List, its ecosystems are globally very significant. Whilst the nominated property's species diversity and rates of endemism are not exceptional for southern Africa, its habitat density and biological productivity (revealed by its high biomass of large mammals), are unique. There is only one other wetland World Heritage site found in Southern Africa, iSimangaliso Wetland Park in South Africa, but it belongs to a different biome and ecoregion, and is almost seven times smaller than the Okavango Delta.

Regarding criterion (x), the Okavango Delta has an exceptional diversity of plant, bird and mammal species, including viable populations of large mammal species, some of them globally threatened such as the Black Rhinoceros, African Wild Dog, Cheetah, Lion, African Elephant, and Hippopotamus. Its species composition reflects the biogeography of the region, with a high diversity of large ungulates. It is also an Important Bird Area (IBA) which has a greater range of habitats than any other wetland in the region.

The comparison further notes that the Okavango Delta has been identified in a 2011 study as one of sixteen key gaps in Africa. Furthermore, the flooded grasslands and savannas biome has been mentioned as a gap in representation of World Heritage sites, and the nominated property overlaps with protected areas which are highly irreplaceable, emphasizing its global importance to species conservation. Okavango has been identified as a priority natural site for over 30 years: it was identified as an Outstanding Natural Site in IUCN's 1982 World Heritage gaps study. It has also featured as an area with significant wetland values which may merit consideration for World Heritage nomination within IUCN's Wetland Thematic Study of 1997.

With respect to criterion (vii) the nominated property compares well globally as a place of outstanding natural beauty which exemplifies many natural phenomena. The Okavango Delta is a large low gradient alluvial fan or 'Inland Delta' (half the size of Belgium) in the lower reaches of the 1,500 km long Okavango River. It is Africa's largest endorheic delta, and the continent's third largest alluvial fan after the Nile and Niger Deltas. The perennial flooding activity continually maintains and shapes the delta system, sustaining extensive areas of permanent swamps and seasonally flooded grasslands. The biota has uniquely adapted its growth and reproductive behaviour to be timed with the arrival of flood-water in the dry, winter season. The inland delta is a natural oasis that lies in the centre of a flat, semi-arid

landscape of Kalahari Desert sands. The Okavango Delta is an outstanding example of the complex inter-relatedness and inter-dependence of climatic, geomorphological, hydrological, and biological processes. Major processes include flood inundation; channel switching; breeding, growth and migration processes; nutrient cycling; floodplain termitaria, colonization and plant succession.

The natural habitats of the nominated area are diverse and include permanent and seasonal rivers and lagoons, permanent swamps, seasonal and occasionally flooded grasslands, riparian forest, dry deciduous woodlands, and island communities. Each of these habitats has a distinct species composition of plants and animals comprising all the major classes of aquatic organisms, reptiles, birds and mammals. The Delta provides a refuge to globally significant numbers of rare and endangered large mammals, including White and Black Rhinoceros, Wild Dog, Lion and Cheetah. As noted above it is an IBA, harbouring 24 species of globally threatened birds, including among others, 6 species of Vulture, Southern Ground-Hornbill, Wattled Crane and the Slaty Egret. Thirty-three species of water birds occur in the Okavango Delta in numbers that exceed 0.5% of their global or regional population.

The comparative analyses outlined above reach similar conclusions that affirm the biodiversity values of the nominated property as meeting natural criteria (vii), (ix) and (x). This conclusion is backed by the almost unanimous views of a significant number of expert reviewers who provided input to IUCN on this evaluation.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

The nomination dossier provided little detail in respect of the legislation pertaining to conservation management of the area. However, the State Party in supplementary information has elaborated on the protective regimes in place across a range of protected area types which make up the nominated property. The Okavango Delta comprises a mosaic of protected lands including the Moremi Game Reserve, Wildlife Management Areas (WMAs) and gazetted settlements which fall within WMAs. About 40% of the property is protected within the Moremi Game Reserve, and the remainder is composed of WMAs and Controlled Hunting Areas (CHAs) managed by community trusts or private tourism concession-holders. The supplementary information confirms the protection afforded to Game Reserves and WMAs. CHAs exist within WMAs and are managed by community based organizations for hunting. The revised property boundaries (see below) comprise a core area of one Game Reserve, one CHA and 18 WMAs.

Legal protection is afforded through Botswana's Wildlife Conservation and National Parks Act, 1992 and an associated Wildlife Conservation Policy. The Tribal Land

Act of 1968 also applies to the property and the whole of the nominated area (and the buffer zone) is communally-owned Tribal Land under the control of the Tawana Land Board. The Board leases a number of concession areas to safari operators and communities for photographic tourism. Legislated objectives of management relate to preservation of natural resources and scenic amenity, promotion of tourism and wildlife utilization and management. There is a proposed ban on hunting within the nominated property imposed due to concerns regarding declining wildlife populations.

It is evident that a complex system of legislation, policy and different protected land tenures apply to the property and accommodate conservation and sustainable community uses. IUCN were informed of the Permanent Secretary of the Ministry of the Government's intention to upgrade the legal status of Moremi Game Reserve to National Park, and would encourage the State Party to consider National Park status for all, or most of, the nominated area.

IUCN has concerns regarding the complexity of protection measures and considers that protection could be further strengthened across the whole property; however, on balance, IUCN considers that the protection status meets the requirements of the Operational Guidelines.

#### 4.2 Boundaries

The State Party in its supplementary information advised of amendments which increased the nominated area of the property by 22.6% and reduced the buffer zone by 34.4%. The main changes to the nominated area are the addition of protected areas in the east and northeast. The buffer zone has been narrowed in the west and southwest where it has been set back from developed areas. The stated rationale for these changes relate to attributes which were excluded from the original nomination, inappropriate original inclusions and to avoid potential conflict with mining concessions. Following these revisions, it appears the majority of the delta and its associated flooded grasslands are included in the nominated area, which at 2,023,590 ha would be one of Africa's largest World Heritage sites. The main elements, species and processes characteristic of the delta could be sustained within this area. However, it must be recognized that the property's Outstanding Universal Value will only be maintained if the inflowing river and its tributaries in Angola and Namibia are kept in a natural state without abstraction of water, building of dams and/or the development of agricultural irrigation schemes. Furthermore, it should be recognized that much of the mega-fauna migrates to areas beyond the boundaries of the property and is consequently vulnerable to hunting and/or any change of status in the buffer zone and beyond.

Five distinct management regimes apply to zones within the nominated area. Moremi Game Reserve occupies about 40% of the area and lies approximately in the

centre of the property, surrounded by WMAs and CHAs. Thus the protected area design principles of having a totally protected core surrounded by zones designated for multiple uses are applicable in this case.

Botswana's livestock industry has for decades depended upon the separation of wildlife and designated livestock grazing lands through the use of high multi-strand veterinary cordon fences intended as a total barrier to the movement of large wild mammals into livestock areas for the prevention of disease transmission. Most of the nominated area is designated a 'livestock free zone', and the southern boundary of the core area is defined by the line of one such veterinary fence. This not only serves to prevent livestock straying into the Delta, but also prevents the traditional migration and dispersal of large wild mammals to the south. The waters of the Okavango overflow the delta periodically via the Selinda Spillway and other channels connecting to Chobe National Park, the Makgadikgadi Pans and Lake Ngami; these channels serve as important migration corridors for elephants and other mega-fauna. Although the nominated area is constrained to some extent by veterinary fences, there is still sufficient ecological connectivity for all long-distance migration routes to be sustained. A significant regional conservation initiative (the Kavango Zambezi Transfrontier Conservation Initiative, KAZA) is underway to link key protected areas (and especially migration routes for one third of Africa's elephants) between protected areas across the 'four corners' border area of Botswana, Namibia, Zambia and Zimbabwe. The link between Okavango and Chobe National Park is a key element of this initiative.

IUCN welcomes the revised boundaries including an enlarged nominated area and redesigned buffer zone and considers that the boundaries of the nominated property meet the requirements of the Operational Guidelines.

#### 4.3 Management

Management responsibilities across the nominated property are shared by the Department of Wildlife and National Parks (DWNP) in the Ministry of Environment, Wildlife and Tourism and the Tawana Land Board. The management framework is considered adequate, with a number of inter-related management plans in place, including the Okavango Delta Management Plan (2008-14), Moremi Game Reserve Management Plan and Ngamiland Integrated Land Use Plan (2009). The completion of a single property wide management plan would harmonize planning across the Delta and ensure a more cohesive approach across the various protected land tenures.

Anti-poaching activities and wildlife management are carried out by a very limited number of patrol staff at Moremi Game Reserve and by a number of other government, community and private sector operations. Overall, on-the-ground management of wildlife appears weak, lacking necessary resources, and is somewhat

ad-hoc. Within Moremi Game Reserve the IUCN mission observed some of the management challenges facing the authorities such as off-road driving, building maintenance and *Salvinia* control. The mission was informed of the general lack of capacity (material resources, vehicles, staff and funding) to fully implement the management plan.

Areas under lease to community trusts benefit from a good system of community-based natural resource management (CBNRM) Technical Advisory Committees (TACs). These TACs participate in the district-level Ngamiland CBNRM Forum, and benefit from the existence of a National CBNRM Forum and Policy. The community-based TACs advise communities on concessions, help resolve disputes, help with management plans and provide other services.

Although basic provision is in place, there are shortfalls in the capacity of management in the property. The nomination dossier notes that most funding comes from government and there is a shortage of resources for the management of the site. The various government departments involved in the site receive the equivalent of approximately 1m USD annually at district level (for all their district-wide activities, only a portion of which involves Okavango). The DWNP submits all revenue from Moremi Game Reserve and other income derived from land royalties, tourism and private concessions to the national treasury, so there is as yet no direct revenue retention scheme for re-investment in the property. With such a substantial 'high-end' tourism industry operating in the Delta it seems very feasible to design and implement a suitable mechanism to re-invest a portion of revenues in the management and conservation of the property, but this is not yet in place.

IUCN considers the nominated property meets the management requirements of the Operational Guidelines whilst noting the need to address a range of other protection and management issues.

#### 4.4 Community

The State Party has confirmed there are 530 residents in three settlements within the revised nominated property and that none of them are of San or Basarwa origin. Cultural heritage and use rights are legally provided for through the Okavango Delta Management Plan and a Community Based Natural Resource Management Policy both dated 2007. Similar guarantees apply to the communities living within the buffer zone. Traditional uses and access to culturally significant places is facilitated.

Governance is extremely complex, involving multiple stakeholders and no single authority. The nominated area falls under a variety of quite distinct management regimes with different governance structures for the constituent Game Reserve, WMAs and CHAs. Most of the government departments involved fall under the Ministry of Environment, Wildlife and Tourism, so the

Permanent Secretary of the Ministry plays a key coordinating role. At local level the Department of Environmental Affairs coordinates management, but there is no clear line management responsibility between government agencies and there is a need to involve community, NGO and private sector stakeholders in management decision making for the property.

The thorough local community consultation process involved in developing the nomination has brought out community issues that will need to be addressed by the organizations representing the affected communities and the Botswana Government. This process appears to have opened up channels of communication between Government Departments and communities, which has had a positive impact on local community awareness and attitudes to the nomination. This communication needs to continue using the existing structures that are in place linking communities and the Botswana Government.

Communities benefit greatly from the Delta at present, with parts of the property under direct management of community trusts, and other areas providing tourism-related direct employment. World Heritage status may lead to an increase in tourism and tourism-related employment. There is no indication in the nomination dossier of any intention to change the rights of access to livelihood materials such as fish, thatching and building materials etc, but the loss of hunting revenue to community trusts will have a negative impact in the short term, at least until a successful transition to non-consumptive (tourism-based) use has been effected. IUCN received representations from some San indigenous groups concerned about forced evictions should the property become a World Heritage site. The State Party provided assurances that the rights of indigenous peoples would continue to be respected, however it was not explicit on the question of evictions. IUCN considers that the World Heritage Committee should reconfirm the importance of the rights of indigenous communities being recognized and respected, and that forced evictions of indigenous peoples from the nominated property would be unacceptable.

#### 4.5 Threats

Populations of large animals in the Okavango Delta have fluctuated over recent years. Census data provided for 2012 and other data reinforces the reported variability in population trends. For example elephant numbers have been increasing whilst other species are reported as exhibiting significant declines. Data is variable, subject to different survey techniques and surveys are somewhat uncoordinated as they are undertaken by different institutions. This all contributes to an unclear picture of the Okavango Delta's wildlife. The State Party reports that DWNP have initiated efforts to establish a Management Oriented Monitoring System which needs to monitor wildlife trends in a comprehensive and integrated manner, thereby tracking the conservation

status of key species across the entire property. IUCN note that more work is needed to fully implement this system. Causes of decline are attributed to seasonal variability, poaching (for example of giraffe for meat) and veterinary cordon fencing used to manage animal sanitation and control the spread of disease between wildlife and domestic stock. Veterinary fences have clearly constrained traditional migration and dispersal routes for large mammals. Fences to the north and east have been removed or abandoned in recent years allowing some restoration of migration routes in these areas, notably towards Makgadikgadi Pans. A major fence remains to the south which defines the core area's southern boundary and is increasingly subject to breaches; also, there seems to be doubt over whether the funds and political will exist to maintain it.

As part of the development of this nomination dossier, close negotiations have taken place with the Permanent Okavango River Basin Water Commission (OKACOM). This tripartite Commission exists to ensure co-operation in the sustainable use of the waters of the Okavango Basin from their source in the southern Angolan highlands, through Namibia's "Caprivi region" into Botswana. The State Party has provided a copy of the OKACOM letter of endorsement dated 17 February 2014 which formalizes the commitment of Angola and Namibia to support the nomination. This is positive but it does not eliminate the threat of upstream water abstraction, dam construction or development of irrigated agricultural schemes. It does however provide a point of reference for any future negotiations over water use by other states. OKACOM represents an opportunity to ensure that any diminution of the natural values and ecological integrity of the Delta is moderated and agreed through a formal process.

Tourism in the Delta is necessarily a low-impact, low-volume business, since there are no permanent roads into the area and everything has to be flown into small-scale tented camps and similar establishments within the area. There will be a need to enhance the regulation and mitigation of environmental impacts of tourism (e.g. pollution, noise, bank erosion, off-roading), but these are not yet a significant threat. There are currently only 2,129 beds in an area of 16,500km<sup>2</sup>, and sound policies and procedures to regulate tourism are in place.

Mining presents one of the more significant potential threats to the Delta as a number of concessions overlap the nominated area and buffer zone. Additional information provided by the State Party shows that a number of mining prospecting licenses (41 in total) are located within and surrounding the property covering base metal, precious stones, petroleum and radioactive materials. Of these, 11 licenses overlap with either the nominated property and/or buffer zone; however only one is wholly in the nominated area and will expire in March 2015. Only three other licenses remain active in the nominated property/buffer zone and these expire in September 2014. Nevertheless there are 12 active licenses in the buffer zone including a petroleum license

active until September 2016. The six radioactive licenses in the buffer zone have all expired. Positive written assurances have been given by the Ministry of Minerals, Energy and Water Resources that the overlapping prospecting licenses will be permanently extinguished and not renewed on their expiry in 2014 or early 2015. The State Party also confirms that no new mining licenses will be issued within the property. In order to comply with the requirements of the World Heritage Convention that extractive industry is incompatible with World Heritage Site status, it will be vital that these commitments are fully implemented and that no prospecting or mining activity whatsoever takes place within the nominated property. Similar assurances have not been given for mining in the buffer zone. In conclusion it is clear that mining does represent a potential threat to the nominated property, particularly within the adjoining buffer zone and given the potential for long range mining impacts via the complex hydrological systems. It is not clear to what degree mining is occurring or proposed in neighbouring Namibia and Angola which are upstream from the nominated property.

A variety of other threats is described in the nomination dossier including those of invasive alien vegetation, possible spraying for renewed tsetse fly control, climate change, pollution, fire and earthquakes. There are no other significant past developments affecting the integrity of the property

In conclusion, despite concerns regarding potential threats and various aspects of the property's management, IUCN considers that the nominated property meets the conditions of integrity as outlined in the Operational Guidelines.

## 5. ADDITIONAL COMMENTS

None.

## 6. APPLICATION OF CRITERIA

**Okavango Delta** has been nominated under natural criteria (vii), (ix) and (x).

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

Permanent crystal clear waters and dissolved nutrients transform the otherwise dry Kalahari Desert habitat into a scenic landscape of exceptional and rare beauty, and sustain an ecosystem of remarkable habitat and species diversity, thereby maintaining its ecological resilience and amazing natural phenomena. The annual flood-tide, which pulses through the wetland system every year, revitalizes ecosystems and is a critical life-force during the peak of the Botswana's dry season (June/July). The Okavango Delta displays an extraordinary juxtaposition of a vibrant wetland in an arid landscape and the

miraculous transformation of huge sandy, dry and brown depressions by winter season floods triggers spectacular wildlife displays: large herds of African Elephant, Buffalo, Red Lechwe, Zebra and other large animals splashing, playing, and drinking the clear waters of the Okavango having survived the dry autumn season or their weeks' long migration across the Kalahari Desert.

IUCN considers that the nominated property meets this criterion.

#### **Criterion (ix): Ecosystems/communities and ecological/biological processes**

The Okavango Delta is an outstanding example of the complex, inter-dependence and interplay of climatic, geo-morphological, hydrological, and biological processes. The continuous transformation of geomorphic features such as islands, channels, river banks, flood plains, oxbow lakes and lagoons in turn influences the abiotic and biotic dynamics of the Delta including dryland grasslands and woodland habitats. The property exhibits a number of exemplary ecological processes related to flood inundation, channelization, nutrient cycling and the associated biological processes of breeding, growth, migration, colonization and plant succession. These ecological processes provide a scientific benchmark to compare similar and human impacted systems elsewhere and give insight into the geological evolution of such wetland systems.

IUCN considers that the nominated property meets this criterion.

#### **Criterion (x): Biodiversity and threatened species**

The Delta's diversity of sub-Saharan plants and animals is comparable with the species diversity elsewhere on the continent. However, the Okavango Delta also sustains robust populations of some of the world's most endangered large mammals such as Cheetah, White and Black Rhinoceros, Wild Dog and Lion, all adapted to living in this wetland system. The Delta's habitats are species rich with 1061 plants (belonging to 134 families and 530 genera), 89 fish, 64 reptiles, 482 species of birds and 130 species of mammals. The natural habitats of the nominated area are diverse and include permanent and seasonal rivers and lagoons, permanent swamps, seasonal and occasionally flooded grasslands, riparian forest, dry deciduous woodlands, and island communities. Each of these habitats has a distinct species composition comprising all the major classes of aquatic organisms, reptiles, birds and mammals. The Okavango Delta is further recognized as an Important Bird Area, harbouring 24 species of globally threatened birds, including among others, 6 species of Vulture, the Southern Ground-Hornbill, Wattled Crane and Slaty Egret. Thirty-three species of water birds occur in the Okavango Delta in numbers that exceed 0.5% of their global or regional population. Finally Botswana supports the world's largest population of Elephants, numbering around 130,000, for which the Okavango Delta is the core area for this species' survival.

IUCN considers that the nominated property meets this criterion.

## **7. RECOMMENDATIONS**

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

The World Heritage Committee,

1. Having examined Documents WHC-14/38.COM/8B and WHC-14/38.COM/INF.8B2;

2. Inscribes the **Okavango Delta (Botswana)** on the World Heritage List under natural criteria (vii), (ix) and (x).

3. Adopts the following Statement of Outstanding Universal Value:

#### **Brief synthesis**

*The Okavango Delta is a large low gradient alluvial fan or 'Inland Delta' located in north-western Botswana. The area includes permanent swamps which cover approximately 600,000 ha along with up to 1.2m ha of seasonally flooded grassland. The inscribed World Heritage property encompasses an area of 2,023,590 ha with a buffer zone of 2,286,630 ha. The Okavango Delta is one of a very few large inland delta systems without an outlet to the sea, known as an endorheic delta, its waters drain instead into the desert sands of the Kalahari Basin. It is Africa's third largest alluvial fan and the continent's largest endorheic delta. Furthermore it is in a near pristine state being a largely untransformed wetland system. The biota has uniquely adapted their growth and reproductive behaviour, particularly the flooded grassland biota, to be timed with the arrival of floodwater in the dry, winter season of Botswana.*

*The geology of the area, a part of the African Rift Valley System, has resulted in the 'capture' of the Okavango River that has formed the Delta and its extensive waterways, swamps, flooded grasslands and floodplains. The Okavango River, at 1,500kms, is the third largest in southern Africa. The Delta's dynamic geomorphological history has a major effect on the hydrology, determining water flow direction, inundation and dehydration of large areas within the Delta system. The site is an outstanding example of the interplay between climatic, geomorphological, hydrological, and biological processes that drive and shape the system and of the manner in which the Okavango Delta's plants and animals have adapted their lifecycles to the annual cycle of rains and flooding. Subsurface precipitation of calcite and amorphous silica is an important process in creating islands and habitat gradients that support diverse terrestrial and aquatic biota within a wide range of ecological niches.*

**Criteria****Criterion (vii)**

Permanent crystal clear waters and dissolved nutrients transform the otherwise dry Kalahari Desert habitat into a scenic landscape of exceptional and rare beauty, and sustain an ecosystem of remarkable habitat and species diversity, thereby maintaining its ecological resilience and amazing natural phenomena. The annual flood-tide, which pulses through the wetland system every year, revitalizes ecosystems and is a critical life-force during the peak of the Botswana's dry season (June/July). The Okavango Delta World Heritage property displays an extraordinary juxtaposition of a vibrant wetland in an arid landscape and the miraculous transformation of huge sandy, dry and brown depressions by winter season floods triggers spectacular wildlife displays: large herds of African Elephant, Buffalo, Red Lechwe, Zebra and other large animals splashing, playing, and drinking the clear waters of the Okavango having survived the dry autumn season or their weeks' long migration across the Kalahari Desert.

**Criterion (ix)**

The Okavango Delta World Heritage property is an outstanding example of the complexity, interdependence and interplay of climatic, geomorphological, hydrological, and biological processes. The continuous transformation of geomorphic features such as islands, channels, river banks, flood plains, oxbow lakes and lagoons in turn influences the abiotic and biotic dynamics of the Delta including dryland grasslands and woodland habitats. The property exemplifies a number of ecological processes related to flood inundation, channelization, nutrient cycling and the associated biological processes of breeding, growth, migration, colonization and plant succession. These ecological processes provide a scientific benchmark to compare similar and human-impacted systems elsewhere and give insight into the long-term evolution of such wetland systems.

**Criterion (x)**

The Okavango Delta World Heritage property sustains robust populations of some of the world's most endangered large mammals such as Cheetah, white and black Rhinoceros, Wild Dog and Lion, all adapted to living in this wetland system. The Delta's habitats are species rich with 1061 plants (belonging to 134 families and 530 genera), 89 fish, 64 reptiles, 482 species of birds and 130 species of mammals. The natural habitats of the nominated area are diverse and include permanent and seasonal rivers and lagoons, permanent swamps, seasonal and occasionally flooded grasslands, riparian forest, dry deciduous woodlands, and island communities. Each of these habitats has a distinct species composition comprising all the major classes of aquatic organisms, reptiles, birds and mammals. The Okavango Delta is further recognized as an Important Bird Area, harbouring 24 species of globally threatened birds, including among others, six species of Vulture, the Southern Ground-Hornbill, Wattled Crane and Slaty Egret. Thirty-three species of water birds occur in the

Okavango Delta in numbers that exceed 0.5% of their global or regional population. Finally Botswana supports the world's largest population of elephants, numbering around 130,000: the Okavango Delta is the core area for this species' survival.

**Integrity**

The property covers most of the Delta, encompassing a vast area of over 2m ha of substantially undisturbed wetlands and seasonally flooded grasslands. It is of sufficient size to represent all of the delta's main biophysical processes and features and support its communities of plant and animal species. Because of its vast size and difficult access the delta has never been subject to significant development and it remains in an almost pristine condition. Tourism to the inner Delta is limited to small, temporary tented camps with access by air. Facilities are carefully monitored for compliance with environmental standards and have minimal ecological impact. Most importantly, the source of the Okavango Delta's waters in Angola and Namibia remain unaffected by any upstream dams or significant water abstraction and the three riparian states have established a protocol under the Permanent Okavango River Basin Water Commission (OKACOM) for the sustainable management of the entire river system. OKACOM has formally supported the inscription of the Okavango Delta on the World Heritage List. It is imperative that upstream environmental water flows remain unimpeded and that over abstraction of water, the building of dams and the development of agricultural irrigation systems do not impact on the sensitive hydrology of the property.

Concerns have been noted regarding fluctuating populations of large animals. Elephant numbers have been increasing whilst other species are reported as exhibiting significant declines. Data is variable, subject to different survey techniques and uncoordinated surveys undertaken by different institutions all contribute to an unclear picture of the Okavango Delta's wildlife. Authorities have initiated efforts to establish a comprehensive and integrated wildlife monitoring system that can accurately track population size and trends for the entire property, however ongoing work is needed to realise this. Causes of decline are attributed to seasonal variability, poaching (for example of giraffe for meat) and veterinary cordon fencing used to manage animal sanitation and control the spread of disease between wildlife and domestic stock.

Mining activities including prospecting will not be permitted within the property. Furthermore, potential impacts from mining including concessions in the buffer zone and outside the buffer zone need to be carefully monitored and managed to avoid direct and indirect impacts to the property, including water pollution. The State Party should also work with State Parties upstream from the Delta to monitor any potential impacts, including from potential diamond mining in Angola, which could impact water flow or water quality in the Delta.

### **Protection and management requirements**

The Okavango Delta comprises a mosaic of protected lands. About 40% of the property is protected within the Moremi Game Reserve, and the remainder is composed of 18 Wildlife Management Areas and a Controlled Hunting Areas managed by community trusts or private tourism concession-holders. Legal protection is afforded through Botswana's Wildlife Conservation and National Parks Act, 1992 and an associated Wildlife Conservation Policy. The Tribal Land Act of 1968 also applies to the property and the whole of the nominated area (and the buffer zone) is communally-owned Tribal Land under the control of the Tawana Land Board.

As noted above the underlying causes of wildlife population declines are not clear, but an imposed hunting ban will further strengthen conservation measures in the property. The State Party is encouraged to develop a coordinated and systematic wildlife monitoring programme to establish population baselines for key species and to track trends. Veterinary cordon fences are known to cause significant disruption to wildlife at individual, population and species levels. Most of the property's core and buffer zones are free of veterinary cordon fencing and the location of site's boundaries was guided by these considerations. However, the Southern Buffalo Fence defines the southern boundary of the World Heritage property and whilst damage has compromised its effectiveness in disease control, it acts as a locally known demarcation to stop cattle grazing within the property. The Northern Buffalo Fence, also within the alignment of the property buffer zone, is known to disrupt connectivity in particular for the region's Roan and Sable Antelope populations. Veterinary fencing is recognised as a sensitive, multi-dimensional issue. The State Party is encouraged to continue efforts to rationalize fencing, removing it when its effectiveness for disease control has become questionable or where more holistic approaches to animal sanitation and disease control are possible.

Ongoing vigilance is critical to ensure mining developments do not adversely impact the property. Past mining prospecting licences have been extinguished, and will not be renewed or extended. No extractive activity is undertaken in the property, and no new licenses will be issued within the property. The State Party should implement rigorous environmental impact assessment procedures for mining activities outside the property but which have the potential to negatively impact on its Outstanding Universal Value, to avoid such impacts.

The Delta has been inhabited for centuries by small numbers of indigenous people, living a hunter-gatherer existence with different groups adapting their cultural identity and lifestyle to the exploitation of particular resources (e.g. fishing or hunting). This form of low-level subsistence use has had no significant impact on the ecological integrity of the area, and today mixed settlements of indigenous peoples and later immigrants

to the area are located around the fringes of the delta, mostly outside the boundaries of the property. Continued special attention is needed to reinforce the recognition of the cultural heritage of indigenous inhabitants of the Delta region. Ongoing efforts should focus upon sensitively accommodating traditional subsistence uses and access rights consistent with the protection of the property's Outstanding Universal Value. Efforts should centre on ensuring that indigenous peoples living in the property are included in all communication about the World Heritage status of the property and its implications, that their views are respected and integrated into management planning and implementation, and that they have access to benefits stemming from tourism.

The State Party is encouraged to address a range of other protection and management issues to improve integrity. These include enhanced governance mechanisms to empower stakeholders in the management of the property; the development of a property specific management plan which harmonizes with planning in the wider landscape; ensuring adequate staffing and funding to build the capacity of the Department of Wildlife and National Parks; and programmes to strengthen the control and elimination of invasive alien species from the property.

4. Commends the efforts and achievements of the State Party and its neighboring countries for adopting significant measures serving the long term conservation and protection of the property.

5. Requests the State Party to:

- a) continue efforts to develop, in partnership with Universities, NGOs and wildlife experts, a coordinated and systematic wildlife monitoring programme to establish population baselines for key species and to track long term trends;
- b) continue efforts to rationalize veterinary cordon fencing, removing it when its effectiveness for disease control has become questionable or where more holistic approaches to animal sanitation and disease control are possible;
- c) ensure no extractive industry activity is permitted in the property, and permanently extinguish all the few remaining mineral prospecting concessions, which are scheduled to expire in 2014, without awarding any timeframe extensions and not issue any new concessions within the property;
- d) carefully monitor and manage mining in areas outside of the property so as to avoid any adverse impacts to the property;
- e) expand and strengthen programmes which accommodate traditional resource use for livelihoods, user access rights, cultural rights and access to opportunities to participate in the tourism sector, in keeping with the property's Outstanding Universal Value; and

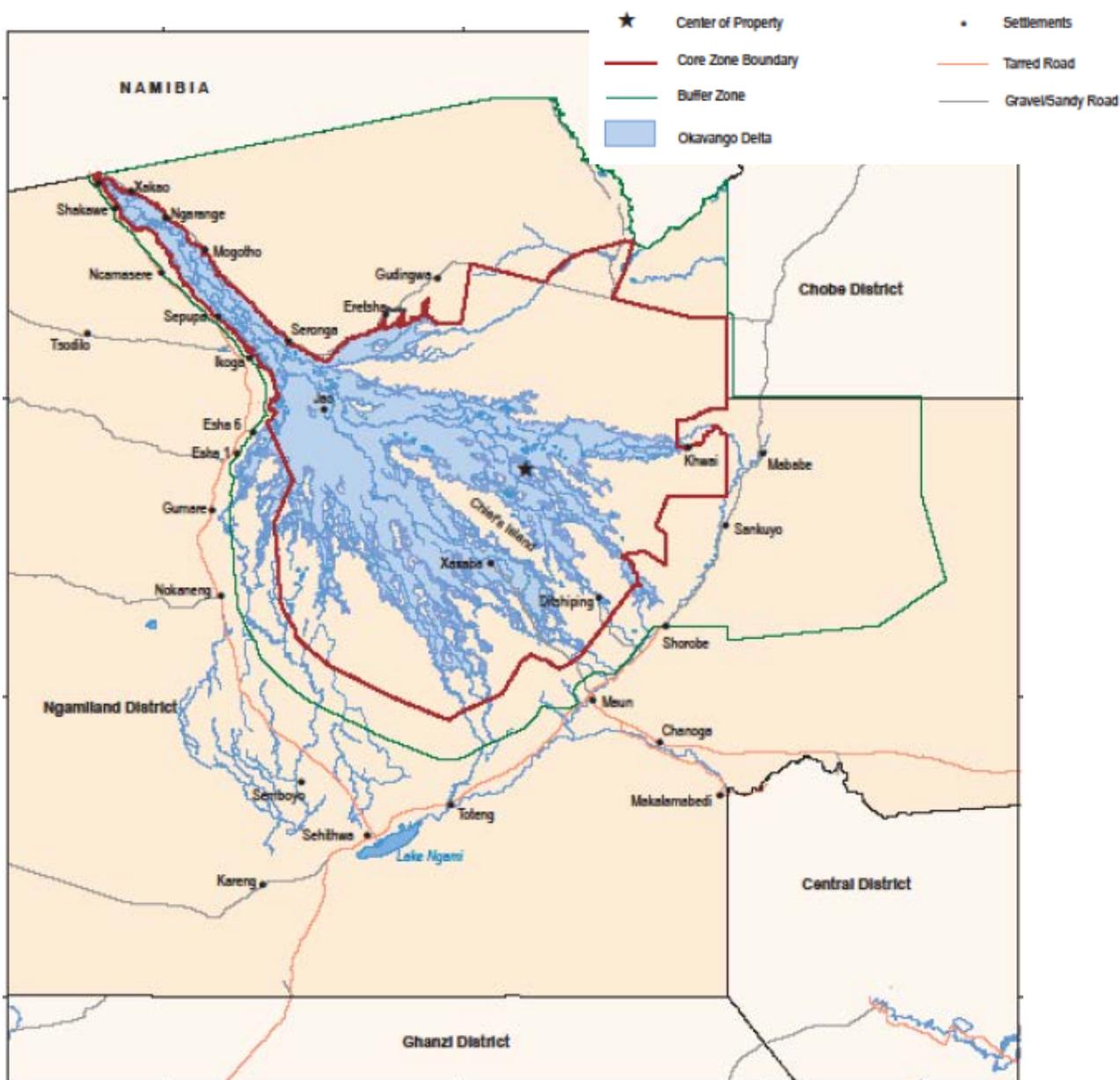
- f) continue efforts to address a range of other protection and management issues including governance, stakeholder empowerment, management planning, management capacity and control of alien invasive species.

6. Further requests the State Party to submit, by **1 February 2016**, a report, including a 1-page executive summary, on the state of conservation of the property, including confirmation of progress on the issues and actions noted above to ensure effective protection and management of the property, for examination by the World Heritage Committee at its 40<sup>th</sup> session in 2016.

**Map 1:** Nominated property location



**Map 2:** Nominated property and buffer zone





**ASIA / PACIFIC**

**SOUTH CHINA KARST (PHASE II)  
(Extension of the “South China Karst”)**

**CHINA**





# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## SOUTH CHINA KARST (PHASE II) (CHINA) – ID No. 1248 Bis

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** To approve the extension under natural criteria.

**Key paragraphs of Operational Guidelines:**

Paragraph 77: Nominated property meets World Heritage criteria.

Paragraph 78: Nominated property meets integrity or protection and management requirements.

**Background note:** This nomination of Phase II of the South China Karst (SCK) seeks to extend Phase I of the property which was inscribed under criteria (vii) and (viii) in 2007 (Decision 31 COM 8.B11). At the time of the first inscription of SCK the World Heritage Committee recommended that the State Party consider this as Phase I of a larger World Heritage nomination, and consider whether the extent of subsequent phases of the entire series could be rationalized into a smaller number of sites and a single phase of nomination rather than two phases. The Committee added that the potential application of criterion (ix) should be considered in relation to the entire series that is eventually proposed. The Committee also recommended a number of other actions to the State Party including review of the boundaries of the (Phase I) Wulong cluster; continued efforts to manage catchment areas with the potential to impact on karst values; continued efforts to positively engage local people in management and future additions to the site; and urging transnational collaboration with Viet Nam on karst systems.

### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 20 March 2013

**b) Additional information officially requested from and provided by the State Party:** Following the technical evaluation mission the State Party was requested to provide supplementary information on 13 December 2013. The information was received on 21 February 2014.

**c) Additional literature consulted:** Various sources listed in the nomination, and in the earlier IUCN evaluation report, including Ford and Williams (2007) **Karst Hydrology and Geomorphology**. IUCN (2008) **World Heritage Caves and Karst – A Thematic Study**, IUCN World Heritage Studies No. 2. Palmer (2007) **Cave Geology**. Woo (2005) **Caves – A Wonderful Underground**.

**d) Consultations:** 22 desk reviews received. The mission also met with elected officials and senior representatives including the Institute of Karst Geology; Chinese Academy of Geological Sciences; Southwest University; Guizhou Normal University; the Chongqing Municipal Government; the Jinfoshan Management Committee; the People's Government of Guizhou Province; the Bureau of Tourism Development and Scenic Resources Management of Southeast Guizhou Autonomous Prefecture; the Committee of Huanjiang Maonan Autonomous County; the Mayor of the People's Government of Guilin City; the Department of Housing and Urban-Rural Development of Guangxi Zhuang Autonomous Region; the Management Administration of Lijiang National Park; the Chinese National Commission

for UNESCO; the Division of WH and Scenic & Historic Areas Management, MoHURD; and many other stakeholders.

**e) Field Visit:** Les Molloy and Kyung Sik Woo, 20-31 August 2013

**f) Date of IUCN approval of this report:** March 2014

### 2. SUMMARY OF NATURAL VALUES

The nominated area for Phase II of the South China Karst (SCK) covers a nominated property of 49,537 hectares (ha) with buffer zones of 77,800 ha which are not part of the nominated area. Phase II of the SCK includes five separate components in four clusters across three Provinces. The State Party has advised, in February 2014, of a modification to the boundary of the Lijiang component within the Guilin Karst cluster. This increased the nominated area of the Lijiang component from 13,910 ha to 22,544 ha. Table 1 shows the relationship of SCK Phase I and Phase II areas. The nomination of these additional areas if inscribed would contribute to an overall SCK serial property of 97,125 ha with a total buffer zone of 176,228 ha comprising twelve components across four Provinces.

Table 2 shows the configuration of areas nominated as SCK Phase II which is the subject of this evaluation.

South China Karst Phase	Nominated property (ha)	Buffer Zone (ha)	Serial configuration
SCK Phase I	47,588	98,428	7 components in 3 Provinces (Yunnan, Guizhou, Chongqing)
SCK Phase II	49,537	77,800	5 components in 3 Provinces (Guizhou, Guangxi, Chongqing)
<b>Total area (ha)</b>	<b>97,125</b>	<b>176,228</b>	<b>12 components in 4 Provinces (Yunnan, Guizhou, Chongqing, Guangxi)</b>

Table 1: Relationship of SCK Phase I to Phase II areas.

Name of the site	County and province	Core zone (ha)	Buffer zone (ha)
Jinfoshan Karst	Nanchuan District, Chongqing City	6,744	10,675
Shibing Karst	Shibing County, Guizhou Province	10,280	18,015
Huanjiang Karst	Huanjiang Monan Autonomous County, Guangxi Zhuang Autonomous Region	7,129	4,430
Guilin Karst	Guilin City, Guangxi Zhuang Autonomous Region	<i>Putao Fenglin Karst Section</i>	2,840
		<i>Lijiang Fengcong Karst Section</i>	22,544
<b>Total area (ha)</b>		<b>49,537</b>	<b>77,800</b>

Table 2: Name and areas of the SCK Phase II nominated core zones and their surrounding buffer zones.

The region of South China (including territory of both China and in neighbouring countries) has one of the largest karst areas in the world, extending continuously over about 550,000 km<sup>2</sup> and recognized as one of the great karst regions in the world, and certainly in the tropics and sub-tropics. It also serves as the type locality for two globally significant karst landforms – fengcong and fenglin. Fengcong is an extensive limestone landscape made up of conical peaks separated by irregular depressions and valleys. Rates of limestone solution are enhanced by tropical and sub-tropical vegetation and abundant rainfall. Drainage is thus entirely underground, caves can occur at several levels and these can feed large springs. Where large rivers intersect this karst, basal corrosion and cliff collapse produce steep-sided, tall karst towers termed fenglin.

The karst terrain displays a geomorphic transition as the terrain gradually descends about 2000m from the western Yunnan-Guizhou Plateau to the eastern Guangxi Basin. The existing SCK sites together with the currently nominated extension track the evolution of karst development from the high inland plateau of Yunnan, where ancient karst remains almost undissected, to the lowlands of Guangxi where karst landforms can be seen in their final stages of evolution as isolated karst towers on corrosion plains.

The Guilin Karst has been developed in massive Devonian limestone which has been folded. Differential tectonic processes combined with allogeneic (rainfed) water input and special hydrological conditions in a humid climate provide excellent conditions for the formation of various karst landforms. The area is characterized by fenglin (tower karst) as well as fengcong (cone karst) landforms. Because of differential tectonic movements and associated contrasting hydrogeological conditions, fenglin karst was able to

develop where the water table was shallow, while fengcong developed where the water table was deeper. Guilin karst illustrates the on-going process of fenglin karst development, and also strong evidence to show that fengcong relief and fenglin relief can develop simultaneously. Guilin Karst represents the near end stage of geomorphological evolution of karst in a humid tropical to subtropical environment. Guilin Karst is widely acknowledged as having the world's best expression of a tower karst landscape and has been internationally recognized as the type-site of continental tower karst. Due to its scenic quality the Guilin Karst is an extremely popular tourist attraction in China.

The Shibing Karst is a spectacular and very unusual fengcong karst with gorges developed in pure, thick and ancient dolomite rocks. The area displays strong karst development in a mid-subtropical karst gorge area with deep river incision. The area demonstrates that relatively insoluble dolomite can also develop typical and spectacular karst landforms, provided environmental conditions are appropriate. The Shibing Karst displays varied karst landforms including flat top hills, cliffs, and canyons resulting in columnar-shaped isolated peaks, tufted-peak-clusters, and knife-ridge mountains. Numerous vertical fractures with almost horizontal stratification in massive dolomite are responsible for these special landforms which are quite distinguishable from limestone landforms.

The Jinfoshan Karst is a unique karst table-mountain characterized by underground river and cave systems with high altitude and multi-level planation surfaces surrounded by massive towering cliffs. Jinfoshan illustrates the process of dissection of the high elevation karst plateau by deep fluvial incision and contains evidence of the region's intermittent uplift and karstification since the Cenozoic. Thus Jinfoshan has

been isolated from the high inland plateau by incision of the surrounding rivers. Beneath the plateau surface are dismembered huge horizontal cave systems that appear at around 2000 m elevation on cliff faces. These once took the runoff of rivers from the high plateau. The plateau must already have been slightly dissected to enable the groundwater circulation that permitted the caves to form, but at that stage the dissection was not deep. Uplift continued and valley incision became more intense, ultimately disconnecting (by river capture) the caves from their headwaters.

The Huanjiang Karst is a direct extension of the existing Libo Karst component of the existing World Heritage property inscribed as part of SCK Phase I. Libo Karst contains a combination of numerous high conical karst peaks, intervening deep enclosed depressions, sinking streams and long underground caves. The World Heritage Committee (Decision 31 COM 8B.11) noted that the cone and tower karsts of the Libo site were considered the world reference site for these types of karst, forming a distinctive and beautiful landscape. The Huanjiang Karst presents comparable karst landforms and landscapes as Libo Karst and its addition to the property area will considerably enhance the integrity of the Libo component.

Although the property was not nominated for its biodiversity values, the nomination dossier includes comprehensive information on aspects of the component vegetation and fauna. Three of the components (Jinfoshan, Shibing and Huanjiang) contain extensive tracts of natural sub-humid forest, habitats for a large number of rare and endangered plants and animals. IUCN notes that the SCK II nomination document does not provide much information on the cave fauna in the four karst components.

### 3. COMPARISONS WITH OTHER AREAS

IUCN in its 2008 World Heritage Caves and Karst Study noted that the South China region can be considered as one of the two great karst regions of the world, the other being the ‘classic karst’ region of the eastern Adriatic region of Europe. Therefore, it is clear that the SCK as a whole possesses Outstanding Universal Value. The region can be considered the global type-site for three karst landform styles: fenglin (tower karst), fengcong (cone karst), and shilin (pinnacle karst). Furthermore, there are numerous, large cave systems with rich speleothem development.

The SCK Phase II properties are also nominated under criteria (vii) and (viii). A comparative analysis was carried out by the State Party based on comparison with other geoheritage sites of similar value from the World Heritage List, Tentative Lists, and other sites with similar characteristics and potential as World Heritage sites. There are 53 World Heritage sites with karst features, including 42 natural, 8 cultural and 3 mixed ones. Forty sites among the 53 were listed as fulfilling either, or both,

criterion (vii) or (viii); there are another 31 on Tentative Lists. The comparative analysis provides clear reasoning on why the limited selection of sites in Phase II of the South China karst is justified, and analysis has been undertaken in relation to a wide range of sites globally, and within region, including both sites included on the World Heritage List, and other significant karst areas.

In summary SCK Phase II contains a well selected range of component parts, which, together with the existing inscribed property, can be regarded as the most complete and distinctive suite of subtropical karst landscapes with diverse and beautiful examples of fengcong- and fenglin-related landforms and karst tableland. The components contain both magnificent positive relief features of tower and cone karst and also negative relief landforms such as karst valleys and caves that add to the aesthetic importance of the overall series.

Guilin Karst is widely acknowledged as the world’s best expression of a tower karst landscape and has been internationally recognized for a long time as the type-site of continental tower karst. The steep sided fengcong and fenglin stand prominently above the horizon. Karst landforms along the Lijiang (Li River) display exceptional aesthetic values and have no analogue in the world. Due to its scenic attractions, Guilin Karst has become one of the most iconic tourist attractions in the world. The expansion of the Lijiang Karst component by some 26% adds valuable additional karst landscape features and greater integrity to the nomination.

Shibing Karst is regarded as the best example of subtropical fengcong dolomite karst in the world. The gorge karst landscape is spectacular with clear water rivers running along picturesque valleys. The landscape illustrates the geological process of rejuvenation which can be seen in many other karst places. However, the rejuvenated fengcong towers here are generally steeper than elsewhere, which may be a consequence of the dolomite lithology. Therefore the dolomite landscape at Shibing is both unusual and impressive, and makes a significant contribution to the SCK.

Jinfoshan Karst is a world-class karst table-mountain surrounded by huge precipitous cliffs punctured by giant entrances to the caves that underlie the mountain. The combination of huge cliffs and caves delivers a spectacular scenic combination. The great tableland with its sublime cliffs and waterfalls, rock pillars, and dense vegetation all contribute to a distinctive aesthetic value accentuated by the vertical zonation of vegetation.

Huanjiang Karst provides a natural extension to the World Heritage listed Libo site which has numerous high conical karst peaks. The Huanjiang Karst has no easily-accessible dramatic commanding viewpoint, and its impressive maze of heavily-forested fengcong peaks is best appreciated from the air. The uniform arrangement and harmonious proportions of the peaks create a wonderful picture.

The three SCK II sites of Shibing, Jinfoshan and Huanjiang have more than 90% of their area clothed in natural vegetation and this provides important habitats of rare and endangered species. The ecosystems provide remarkable examples of harmony between humans and nature in karst areas and thereby greatly increase the aesthetic values. Based on comparative analysis, the karst landforms of the SCK II (combined with SCK I) properties provide the world's most outstanding aesthetic examples of tower karst, cone karst, karst table-mountain and pure dolomite karst in the humid tropics and subtropics of the world.

A further notable point relates to karst landscapes and dolomite lithology. Karst systems do form on dolomite, but not to the same degree as in limestone due to lower solubility. Caves are less well developed and speleothems rather rare. The Nahanni World Heritage Site in Canada is an example of a formerly glaciated dolomite karst with large enclosed depressions or poljes, springs and caves. The Shibing Karst in this nomination is a very good example of humid tropical to subtropical dolomite karst. It is also the best fengcong developed on dolomite in Asia, if not the world.

The Phase I and Phase II serial properties thus provide a representative selection of karsts in South China that collectively demonstrate the evolution of karst in the region and the huge variety of landforms from the high plateau of Yunnan to the tropical lowlands of Guangxi. If inscribed, the overall property would contain the most representative karst landforms including fenglin (tower karst), fengcong (cone karst), shilin (pinnacle karst), as well as other spectacular and diverse karst features such as tiankeng (large dolines or sky windows) natural bridges, gorges and large caves. The SCK property, completed by the sites included in Phase II, thus represents an exceptional history of landscape evolution in one of the world's two great karst regions.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

All five components of the nomination have legislative protection as they fall within the boundaries of several national parks and/or national nature reserves. The components of the property are protected constitutionally and via several national laws covering environmental protection, wildlife, forestry and water. A series of more detailed regulations operate at Provincial level to establish a comprehensive suite of legal protection.

All components are subject to management plans to ensure protection within an overall management framework. All five have zoning and monitoring programmes. The three-fold zoning system – *strict protection zone*, *visitor utilization zone*, and *community utilization zone* – outlined in maps in the overall Management Plan is logical and seems to be sensibly applied in all five components of the site.

All land tenure is vested in the State. Resource use is increasingly regulated; hunting is illegal and firewood collection from the natural landscape is discouraged through the establishment of coniferous plantations on the hill slopes near the villages in the buffer zones. There is no mining in the nominated property. There are traditional rights for sustainable collection of bamboo shoots from part of the Jinfoshan summit plateau, and collection of traditional medicinal plants is allowed under regulation.

IUCN consider that the protection status of the nominated extension meets the requirements of the Operational Guidelines.

### 4.2 Boundaries

As Phase II of the SCK serial nomination, the integrity requirements of these additional components of the property are twofold: (a) their need to contribute to the overall thematic integrity of the full site and (b) the need for each to have its own landform or geomorphic integrity.

The first integrity challenge, therefore, was to select a small number of new locations complementary in karst characteristics and natural scenery with the components of SCK I yet overall still meeting criteria (vii) and (viii). IUCN consider that this has been achieved with the additional areas nominated. Jinfoshan is a high karst table mountain, an isolated portion of the Yunnan-Chongqing-Guizhou plateau, circumscribed by spectacular cliffs, with multi-level planation surfaces and caves at different levels marking the uplift of the plateau. Shibing is unusual fengcong karst with fengcong-gorge and fengcong-valley landforms developed in dolomitic rocks. Guilin and Putao, the lowest altitude components, complete the development sequence as it is the near-end stage of geomorphological evolution of karst in subtropical climates, with its spectacular iconic landscapes of both cone and tower karst. IUCN welcomes the State Party decision to extend the Lijiang Karst area of the Guilin cluster, following recommendations made following the field mission and as confirmed in supplementary information, thereby adding some of the best fenglin formations in the Guilin Karst area which were not originally included in the nomination, or even in the proposed buffer zone. Some of these represent possibly the best fenglin formations globally. Huanjiang is nominated as an extension (into Guangxi Province) of the Libo cone karst of Guizhou Province in SCK I. While it does not extend the karst landform diversity of the overall serial site, it does enhance its integrity by adding to Libo a contiguous, largely unmodified landscape of cone karst with a cover of monsoonal rainforest.

With respect to the second integrity requirement, both Jinfoshan and Shibing contain all the elements and processes necessary to contribute their distinctive karst characteristics to the overall serial site. As stated above, Huanjiang can be considered as a very natural extension

of Libo, but it is also of high geo- and biophysical integrity in its own right. The Guilin karst component consists of two localities – the Lijiang fengcong section and the Putao fenglin section. The Lijiang section has a high degree of landscape and topographic integrity, being the 34 km-long Lijiang karst gorge and the skyline watershed along this length of the river. It stretches eastward to include the large Guanyan Cave, at 12 km the longest of the 1,000 known caves in Guilin.

All components have well defined boundaries which are considered adequate to ensure protection of scenic and karst values. The buffer boundaries are also considered adequate, often being the defined cadastral boundaries of national parks and other protected areas.

The issue of connectivity is important in hydrological terms, and this is particularly important in the Guilin component. Here three nature reserves have been formed in the Lijiang basin to protect the hydrology. The State Party's extension of the Lijiang Karst component will enhance connectivity. Huanjiang is directly connected to the listed Libo component of SCK Phase I, thereby providing a continuous protected natural landscape of cone karst.

IUCN consider that, with the inclusion of the extension of the Lijiang Karst area, the boundaries of the nominated extension meet the requirements of the Operational Guidelines.

### 4.3 Management

The State Party has already established a multi-level management system (involving 18 major government agencies, which also co-ordinate a wide range of technical and research institutes, and local communities) across all five SCK Phase II components. In addition, the expertise of several major karst research institutions (such as the Jinfoshan Karst Research Center and the Institute of Karst Geology in Guilin) and universities have contributed to the increasing pool of knowledge for management to undertake protective measures. The State Party has advised of plans to create a unified administration and management system should the SCK Phase II extension be approved. The system to be actioned by 2015 will involve all regional entities where the serial site components occur: Yunnan (Shilin), Guizhou (Libo and Shibing), and Guangxi (Huanjiang and Guilin) provinces, and the municipality of Chongqing (Wulong and Jinfoshan). Under the national guidance of MoHURD, a *South China Karst Coordination Committee of World Heritage Protection and Management* will be set up to co-ordinate the work of the four regional Management Bureaux. The State Party in its advice of February 2014 has detailed comprehensive governance arrangements and a timetabled action plan for implementation.

Management Plans are already in place for the five existing protected areas and, as noted above, a proposed Management Plan covering all five

components of the nomination has been submitted at the time of nomination. The proposed overall Management Plan states that currently there are 309 fulltime staff across the SCK II sites, over 50% of whom are in Jinfoshan; there are another 540 part-time staff (mainly 'security' rangers) and half of these are in the Guilin component. Only 61 of these staff are technical professionals and the overall Management Plan considers that "At present, professional and technical personnel in each of the management teams is relatively weak". If the nomination is listed, it is planned to more than double professional staff by recruiting another 74 over the next three years.

The sources and levels of finance to support all five components are outlined in the nomination. There are some concerns regarding significant variations in resourcing levels between the different components. However, overall financing appears satisfactory.

In light of the existing governance and planning regime plus proposals to create an overall framework for the whole of the SCK, IUCN considers the management of the nominated extension meets the requirements of the Operational Guidelines.

### 4.4 Community

Although minority peoples (Miao and Dong in Shibing, Maoyan in Huanjiang) are prevalent in two of the components, there is no traditional management of the sites. They are managed by provincial and county state agencies, often working in co-operation with local communities.

Local people expressed satisfaction regarding consultation during the nomination process and the majority expressed support and aspirations connected to conservation and tourism related employment opportunities. Government sponsored infrastructure improvements such as new roads, house renovation and decoration were welcomed by local people met by the mission. Villagers did not seem to be requesting a co-management role but certainly hoped for employment opportunities. In the Jinfoshan and Shibing meetings, concern at outside investors taking tourism opportunities away from local communities was expressed; and with a wish for village-based accommodation and guiding opportunities, local people are looking to the administering agencies to safeguard this.

Should the nominated property be inscribed it would not change existing land tenure. There could however be some negative impacts on some traditional cultural rights, such as restrictions on harvesting of traditional plant-based medicines, and religious practices in some caves of Jinfoshan.

### 4.5 Threats

The physical isolation, lack of arable land in the fengcong karst, and absence of roads in Shibing and

Huanjiang has saved them from any significant detrimental development. Jinfoshan has remained free of permanent human settlement, with limited cable-car and road access and to date only minimal tourist infrastructure. There is a traditional sustainable harvest of bamboo shoots from a small part of Jinfoshan's summit plateau and this does not seem to detract from the karst features.

Guilin is the most developed component and its natural environment has suffered from significant development in the past. A large population live upstream of the Lijiang Gorge and their impact on both the flow volume and water quality of the Lijiang River (especially from water abstraction for both municipal water supply and irrigation, the discharge of sewage waste and the leaching of agricultural pollutants) is well-covered in the proposed overall Management Plan. The Guilin authorities have taken a number of remedial measures since the 1980s, such as relocating large-scale industrial, quarrying and mining activities and treating 90% of the domestic and industrial sewage discharges in the Lijiang River Basin in 20 sewage treatment plants.

There are two main threats to the karst sites: (a) agricultural (and human settlement in Guilin) pollution of allogenic waters and (b) anticipated increasing tourism pressures. The threats from village-based agriculture in the buffer zone of Shibing (especially upstream of the nominated core) has been recognized and is being addressed by improvements in crop selection and site management to minimize runoff, restriction of pesticide use, education on avoiding discarding litter to waterways, village waste treatment, household production of biogas to avoid the cutting of forest for firewood, etc. The field mission inspected examples of this effort, coupled with aesthetic and environmental improvements in village buildings, road design, and dwelling refurbishment being encouraged by government grants. Agricultural threats in Jinfoshan and Huanjiang are not significant but they are a major issue in the Putao section of Guilin. In the Putao segment the challenge is to make the long-standing agricultural and residential activity (mainly small-scale farming of orange orchards and vegetables) as environmentally-benign as possible. This particularly applies to reversing some of the tradition human impacts on the hydrology of the fenglin-plain (especially controlling fertilizer and pesticide use and protecting the waters of the footcaves). A series of remedial programmes are outlined within the proposed overall Management Plan.

With respect to the impact of the human population in Guilin city and the wider basin, management efforts, particularly over the past 5 years, have sought to minimize pollutants entering the hydrology of the Lijiang catchment. All counties on both sides of the Lijiang had waste treatment plants by 2011, removing 93% of pollutants from the water (the other 7% comes from scattered households not yet in the network). Of the total 300 million yuan spent on water treatment each year in Guangxi Province, one third is spent on keeping the

Lijiang as clean as possible, and 45% of the price for using each m<sup>3</sup> of water goes into water treatment.

Since the 1980s, more than 100 million tourists have visited the remarkable Guilin karst landscapes and currently 1,500,000 visitors annually come to the Lijiang segment of Guilin. Most of these tourists only undertake sightseeing cruises through the Lijiang Gorge and they have little direct physical impact on the karst landscape itself. The quality of the visitors' sightseeing experience is a major consideration for the guides on the 100 large boats and 450 village-based bamboo rafts, with careful spacing of the larger boats and training to ensure that visitors respect this natural environment. However, this level of visitation is steadily increasing and can be expected to increase further if the Guilin karst component is listed. The whole issue of controlling tourist infrastructure (management of 'show caves', hotels and village-based accommodation, power lines and other utilities, etc), inappropriate riverbank structures, and cruise boat waste disposal along the Lijiang Gorge has been an on-going management challenge in the past and a wide range of remedial measures for Guilin are addressed in the Management Plan.

Increasing tourist pressure is also a threat to Jinfoshan, judging by the large number of tourist hotels being built in the valleys around the periphery of the buffer zone. It was stated that many of these were to accommodate recreational visits to the cooler mountains by the large population of Chongqing city; however, this may lead to increasing pressure for easier access to the summit plateau and its karst features (especially the caves and 'ancient stone forest'). The small capacity of the existing north cable car is currently a limiting factor. The current level of tourist facilities on Jinfoshan's summit plateau is not detracting from the aesthetic values of the landscape but there is a major question about how the outstanding natural values of the site could be sustained if pressure for day visits escalated sharply. The Shibing component does have a small tourist inflatable raft enterprise on a 10 km fengcong-gorge section of the Shanmuhe from Jiangjiantian to Niejiayan. This is currently a sustainable, well-managed experience of the karst landscape from the narrow riverbed. There are no observable detrimental environmental impacts and it is likely that river flow conditions play a major role in regulating the intensity of use, now and in the future.

In summary, IUCN welcomes the positive proposal of the State Party to expand the Lijiang Karst component of the nomination and its commitment to address a number of existing and potential threats. IUCN considers that the integrity, protection and management of the nominated property meet the requirements of the Operational Guidelines.

## 5. ADDITIONAL COMMENTS

### 5.1 Justification for Serial Approach

#### a) What is the justification for the serial approach?

The framework for a serial nomination to conserve the scale of the SCK has already been established through the decisions of the World Heritage Committee in 2007 when the three components of Phase I were listed. In short, there is every justification for a serial approach to cover the diversity of karst landforms and processes in South China.

SCK Phase II along with the components of SCK Phase I together constitute a complete serial site. The total property contains the most representative karst landforms of South China from interior high plateau to lowland plains. In combination it constitutes the outstanding example of humid tropical to subtropical karst. IUCN note that elements of the South China karst region also extend into neighbouring Viet Nam, including some sites of comparable significance to components of the SCK.

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

The SCK Phase II component parts complement those presented in SCK Phase I and together they provide a more complete serial heritage than achieved by either on its own. The serial property will then contain representative karst landforms from plateau to low-lying plain. It also displays a complete karst evolutionary sequence, as well as some of the most spectacular and diverse karst landscapes in the world, such as dissected plateau, table-mountain karst, tiankeng and pure dolomite karst. Together they tell the geological history and karst landscape evolutionary story from the Permian to the present.

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

There are existing management plans for all five current protected areas. There is also an 'effective overall framework' coordinating the management of the five components which are the subject of this nomination for extension. As noted above, there are proposals to establish enhanced coordination measures across the entire SCK should this extension be approved.

## 6. APPLICATION OF CRITERIA

The **South China Karst (Phase II)** has been nominated under natural criteria (vii) and (viii) as an extension of the South China Karst.

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

SCK Phase II contains an exceptional and distinctive subtropical karst landscapes with beautiful and diverse

examples of fengcong-depression, fengcong-gorge, fengcong-valley, tableland, and fenglin-plain, complementing SCK Phase I. The components contain both magnificent positive relief of cone and tower karsts and also negative landforms such as karst valleys and caves that add to the aesthetic importance. Each nominated component has its own distinctive natural landscape characteristics. The additional karst landforms of Phase II of the SCK will complete the diverse spectrum of SCK landscapes and landforms. In addition, the three SCK Phase II sites of Shibing, Jinfoshan and Huanjiang have more than 90% of their areas covered with natural vegetation and are the habitats of rare and endangered species. These natural ecosystems greatly increase the aesthetic values of the nomination. The Lijiang Gorge section of Guilin is renown globally as one of the most dramatic and scenic riverine landscapes in the world. All five components contain superlative natural phenomena in some of their karst features. The karst landforms of the SCK Phase II (combined with SCK Phase I) properties represent the most aesthetically outstanding examples of tower karst, cone karst, karst table-mountain and pure dolomite karst in the humid tropics and subtropics in the world.

IUCN considers that the nominated property meets this criterion.

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

The nominated SCK II properties display a great variety of surface and underground karst landforms. Tower karst in Guilin, dolomite karst in Shibing and table-mountain karst in Jinfoshan are the most typical landforms with significant geomorphic value. With the Huanjiang Karst, they represent an outstanding global example of cone karst. All of these represent karst evolution under continental interior humid tropical to subtropical conditions. Guilin Karst is the world type-site for continental humid tropical tower karst. It contains the best international example of continental fenglin (tower karst), providing a perfect geomorphic expression of the end stage of karst evolution in South China. Shibing Karst illustrates the best dolomite fengcong-gorge karst in South China. Similar landscapes are common in humid tropical limestone karst regions, but are extremely rare in pure dolomite terrain. For this reason, Shibing Karst can be noted as the global reference site for humid tropical to subtropical dolomite karst. Jinfoshan Karst is a world-class example of karst table mountain. Huanjiang Karst is a direct extension of the Libo Karst which provides a world-class example of fengcong (cone karst) and is the prime example of cone karst evolution in the humid tropical and subtropical continental interior. The progressive evolution of South China's karst is a globally-significant outstanding geological story. SCK Phase II further enhances the evolutionary story advanced in part in Phase I of SCK.

IUCN considers that the nominated property meets this criterion.

## 7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC-14/38.COM/8B and WHC-14/38.COM/INF.8B2;

2. Approves the **South China Karst Phase II (China)** as an extension of the South China Karst on the World Heritage List under natural criteria (vii) and (viii).

3. Adopts the following Statement of Outstanding Universal Value for the property as a whole (Phase I and Phase II component parts), replacing the Statement of Outstanding Universal approved by Decision 31COM 8B.11 in 2007:

### **Brief synthesis**

*The huge karst area of South China is about 550,000 km<sup>2</sup> in extent. The karst terrain displays a geomorphic transition as the terrain gradually descends about 2000 meters over 700 kilometers from the western Yunnan-Guizhou Plateau (averaging 2100 meters elevation) to the eastern Guangxi Basin (averaging 110 meters elevation). The region is recognized as the world's type area for karst landform development in the humid tropics and subtropics.*

*The World Heritage Property of South China Karst is a serial property that includes seven karst clusters in four Provinces: Shilin Karst, Libo Karst, Wulong Karst, Guilin Karst, Shibing Karst, Jinfoshan Karst, and Huanjiang Karst. The total area is 97,125 hectares, with a buffer zone of 176,228 hectares. The property was inscribed in two phases.*

**Phase I** inscribed in 2007, include three clusters totaling 47,588 hectares, with buffer zones totaling 98,428 hectares:

- *The **Shilin Karst** component is in Yunnan province and contains stone forests with sculpted pinnacle columns and is considered the world reference site for pinnacle karst. Shilin Karst consists of two core areas surrounded by a common buffer zone. The area is 12,070 hectares with a buffer zone of 22,930 hectares. The buffer zone is designated as a UNESCO Geopark.*
- *The **Libo Karst** component is in Guizhou province and includes high conical karst peaks, intervening deep enclosed depressions (cockpits), sinking streams and long underground caves. The area is considered a world reference site for cone karst. The property consists of two core areas surrounded by a common buffer. The area is 29,518 hectares with a buffer zone of 43,498 hectares. One of the components is a national nature reserve.*
- *The **Wulong Karst** component is in Chongqing province and consists of high inland karst plateaux that have experienced considerable uplift. Its giant dolines and bridges are representative of South China's*

*tiankeng (giant collapse depression) landscapes, and provide the evidence for the history of one of the world's great river systems, the Yangtze and its tributaries. The Wulong Karst component is a cluster of three core zones, each with a separate buffer zone. The areas total 6,000 hectares with buffer zones of 32,000 hectares.*

**Phase II** inscribed in 2014 includes four clusters totaling 49,537 hectares, and buffer zones totaling 77,800 hectares:

- *The **Guilin Karst** component in Guangxi province is located within Lijiang National Park and contains fenglin (tower) and fengcong (cone) karst formations. Guilin Karst is divided into two sections: the Putao Section with an area of 2,840 hectares and a buffer zone of 21,610 hectares and the Lijiang Section with an area of 22,544 hectares and a buffer zone of 23,070 hectares.*
- *The **Shibing Karst** component in Guizhou province includes dolomitic karst formations and is located within Wuyanghe National Park. Shibing Karst has an area of 10,280 hectares and a buffer zone of 18,015 hectares.*
- *The **Jinfoshan Karst** component is a unique karst table mountain surrounded by towering cliffs. Jinfoshan Karst is located in Chongqing province within the boundaries of the Jinfoshan National Nature Reserve and Jinfoshan National Park. The Jinfoshan component has an area of 6,744 hectares and a buffer zone of 10,675 hectares.*
- *The **Huanjiang Karst** component is a cone karst area located in Guangxi Province within the boundaries of the Mulun National Nature Reserve. The Huanjiang Component has an area of 7,129 hectares and a buffer zone of 4,430 hectares.*

*The South China Karst World Heritage property protects a diversity of spectacular and iconic continental karst landscapes, including tower karst (fenglin), pinnacle karst (shilin) and cone karst (fengcong), as well as other karst phenomena such as Tiankeng karst (giant dolines), table mountains and gorges. The property also includes many large cave systems with rich speleothem deposits. The karst features and geomorphological diversity of the South China Karst are widely recognized as among the best in the world. The region can be considered the global type-site for three karst landform styles: fenglin (tower karst), fengcong (cone karst), and shilin (stone forest or pinnacle karst). The landscape also retains most of its natural vegetation, which results in seasonal variations and adds to the outstanding aesthetic value of the area.*

*The property contains the most spectacular, scientifically significant and representative series of karst landforms and landscapes of South China from interior high plateau to lowland plains and constitutes the world's premier example of humid tropical to subtropical karst: one of our planet's great landscapes. It complements sites that are also present in neighbouring countries, including Viet Nam, where several World Heritage properties also exhibit karst formations.*

## Criteria

### Criterion (vii)

The South China Karst World Heritage property includes spectacular karst features and landscapes, which are both exceptional phenomena, and of outstanding aesthetic quality. It includes the stone forests of Shilin, superlative natural phenomena which include the Naigu stone forest occurring on dolomitic limestone and the Suyishan stone forest arising from a lake, the remarkable fengcong and fenglin karsts of Libo, and the Wulong Karst, which includes giant collapse depressions, called Tiankeng, and exceptionally high natural bridges between them, with long stretches of deep unroofed caves.

It also includes Guilin, which displays spectacular tower karst and internationally acclaimed fenglin riverine landscapes, Shibing Karst, which has the best known example of subtropical fengcong karst in dolomite, deep gorges and spine-like hills often draped with cloud and mist, and Jinfoshan Karst, which is an isolated island long detached from the Yunnan-Guizhou plateau, surrounded by precipitous cliffs and punctured by ancient caves. Huanjiang Karst provides a natural extension to Libo Karst, contains outstanding fengcong features and is covered in almost pristine monsoon forest.

The property's forest cover and natural vegetation is mainly intact, providing seasonal variation to the landscape and further enhancing the property's very high aesthetic value. Intact forest cover also provides important habitat for rare and endangered species, and several components have very high biodiversity conservation value.

### Criterion (viii)

The South China Karst World Heritage property reveals the complex evolutionary history of one of the world's most outstanding landscapes. Shilin and Libo are global reference areas for the karst features and landscapes that they exhibit. The stone forests of Shilin developed over 270 million years during four major geological time periods from the Permian to present, illustrating the episodic nature of the evolution of these karst features. Libo contains carbonate outcrops of different ages shaped over millions of years by erosive processes into impressive Fengcong and Fenglin karsts. Libo also contains a combination of numerous tall karst peaks, deep dolines, sinking streams and long river caves. Wulong represents high inland karst plateaus that have experienced considerable uplift, with giant dolines and bridges. Wulong's landscapes contain evidence for the history of one of the world's great river systems, the Yangtze and its tributaries. Huanjiang Karst is an extension of the Libo Karst component. Together the two sites provide an outstanding example of fengcong karst and also preserves and displays a rich diversity of surface and underground karst features.

Guilin Karst is considered the best known example of continental fenglin and provides a perfect geomorphic

expression of the end stage of karst evolution in South China. Guilin is a basin at a relatively low altitude and receives abundant allogenic (rainfed) water from surrounding hills, leading to a fluvial component that aids fenglin development, resulting in fenglin and fengcong karst side-by-side over a large area. Scientific study of karst development in the region has resulted in the generation of the 'Guilin model' of fengcong and fenglin karst evolution. Shibing Karst provides a spectacular fengcong landscape, which is also exceptional because it developed in relatively insoluble dolomite rocks. Shibing also contains a range of minor karst features including karren, tufa deposits and caves. Jinfoshan Karst is a unique karst table mountain surrounded by massive towering cliffs. It represents a piece of dissected plateau karst isolated from the Yunnan-Guizhou-Chongqing plateau by deep fluvial incision. An ancient planation surface remains on the summit, with an ancient weathering crust. Beneath the plateau surface are dismembered horizontal cave systems that appear at high altitude on cliff faces. Jinfoshan records the process of dissection of the high elevation karst plateau and contains evidence of the region's intermittent uplift and karstification since the Cenozoic. It is a superlative type-site of a karst table mountain.

### Integrity

The components of the serial property have within their boundaries all the necessary elements to demonstrate the natural beauty of karst landscapes. They also contain the scientific evidence required to reconstruct the geomorphic evolution of the diverse landforms and landscapes involved. The components are of adequate size and they have buffer zones which will help ensure the integrity of the earth science values, including tectonic, geomorphic and hydrological features. Some issues that face the property require policies and actions to be taken beyond the buffer zone boundaries. Challenges to the integrity of the property include human pressure both from people living in and/or around the property, and the pressures from visitors. However many measures have been and are being undertaken to address these issues. The natural environment and natural landscapes within the nominated properties are all well-maintained, in order to protect the features of Outstanding Universal Value, and the natural landscapes and processes that support them.

### Protection and Management Requirements

The property is well managed, with management plans in place for each component, and which will be established and maintained for the serial property a whole, and with effective involvement of stakeholders. Part of Libo Karst is within a national nature reserve. The buffer zone for Shilin is a UNESCO-recognised Global Geopark. Traditional management by minority peoples is an important element in management of a number of components, and the relationship between karst and the cultural identity and traditions of minority groups, including for example the Yi (Shilin), the Shui, Yao and Buyi (Libo) and Jinfoshan bamboo harvesters requires continued recognition and respect in site management.

*There are strong international networks in place to support continued research and management. Continued efforts are required to protect upstream catchments and their downstream and underground continuation to maintain water quality at a level that ensures the long term conservation of the property and its subterranean processes and ecosystems. Potential for further extension of the property requires development of a management framework for effective coordination between the different clusters.*

*Guilin, Shibing and Jinfoshan are national parks; Jinfoshan is a national nature reserve and Huanjiang is a national nature reserve and a Man and Biosphere Reserve. These components therefore benefit from a history of protection under relevant national and provincial laws and regulations and each of the Phase II component parts has a management plan. An integrated Management Plan of the South China Karst to support the sites added in 2014 has been developed.*

*Long term protection and management requirements for the component parts of the South China Karst include the need to ensure coordination throughout the serial site as a whole, through the establishment of a Protection and Management Coordination Committee for the South China Karst World Heritage; further enhance involvement of local communities and the maintenance of the traditional practices of the indigenous peoples concerned; strengthen whole catchment management to assure water quality is protected, and to avoid pollution; and strictly prevent negative impacts from tourism, agriculture and urban development activities from impacting the values of the property.*

4. Urges the State Party to continue efforts to integrate planning, governance and management across the whole South China Karst World Heritage site including the proposed finalization of a management plan anticipated by 2015.

5. Commends the State Party for its efforts to manage diverse threats to the property arising from tourism, water pollution, agriculture and urban development activities and recommends the continued close monitoring of these potential impacts.

6. Further notes that the inscription of this property completes the South China Karst serial property, thereby making a significant contribution to the recognition of karst sites on the World Heritage List and setting a high standard for the quality of argument required to support inscription of any further karst sites; and therefore signals that the numbers of additional karst sites suitable for inscription on the World Heritage List is likely to be very small.

7. Recommends that the State Party consider future re-nomination of South China Karst properties under biodiversity criteria in light of the intact forest cover in many of the properties which are of high biological value.

8. Encourages the State Party to cooperate with the State Party of Viet Nam to ensure technical cooperation and exchange as well as the harmonization of management practice and promotion in line with the transnational dimension of the karst systems of the South China region, recognising sites in neighbouring States Parties that are recognised or have potential Outstanding Universal Value.

9. Further requests the State Party to submit, by **1 February 2017**, a report, including a 1-page executive summary, on the state of conservation of the property, including progress on the finalization of a property-wide management plan; the implementation of integrated governance arrangements; and the implementation of actions to manage tourism, water quality, agricultural and urban development impacts to ensure protection of the property, for examination by the World Heritage Committee at its 41<sup>st</sup> session in 2017.

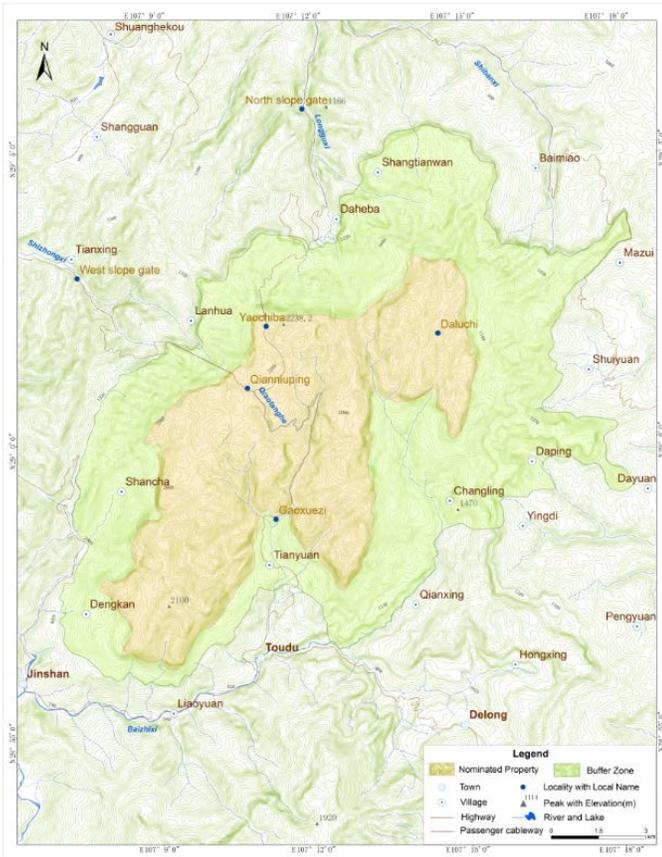
**Map 1:** Nominated property location



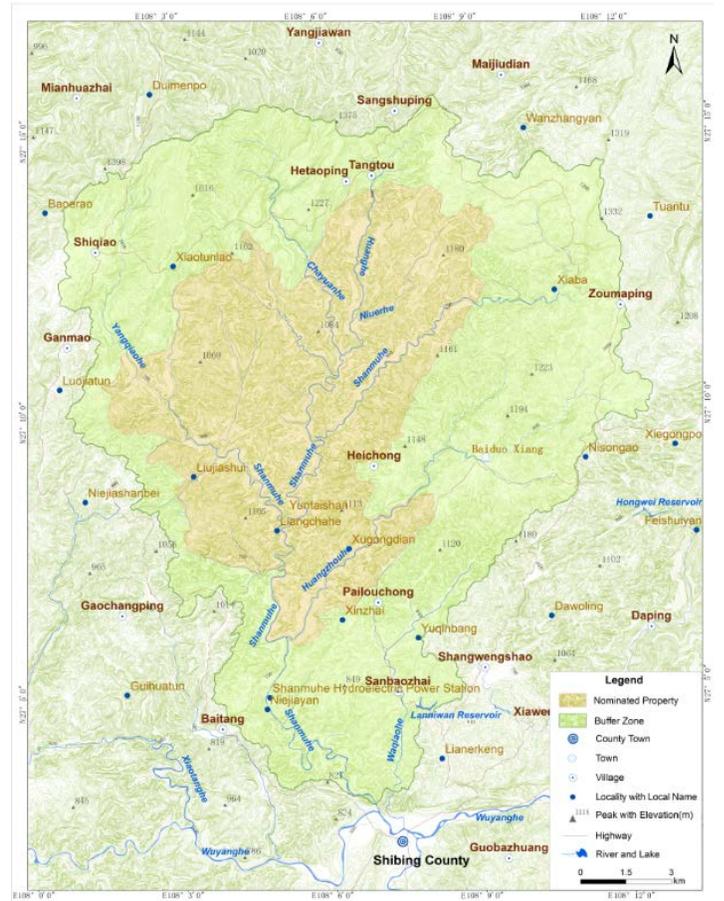
**Map 2:** Huanjiang Karst Component and buffer zone



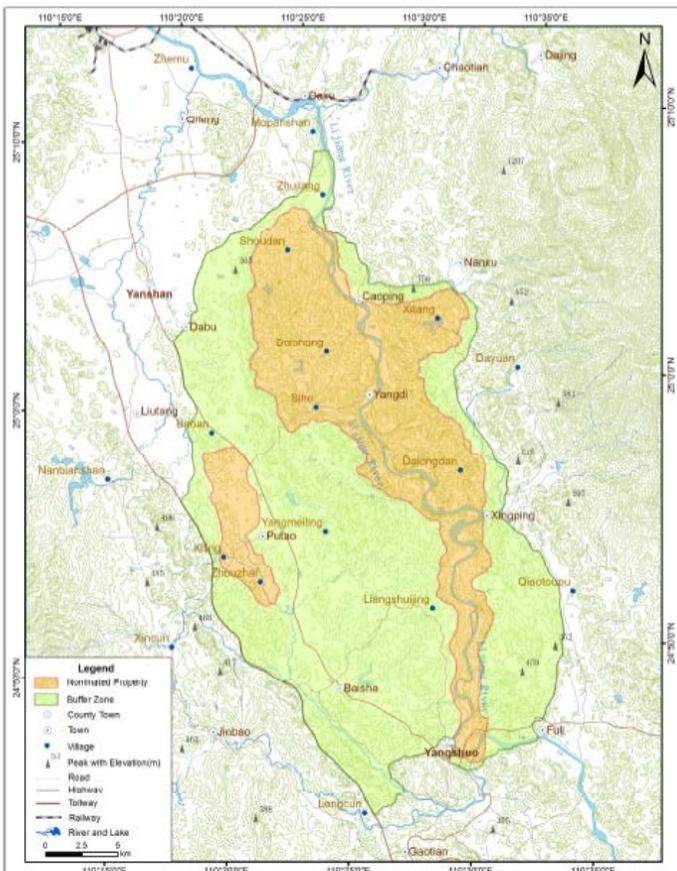
**Map 3: Jinfoshan Karst Component and buffer zone**



**Map 4: Shibing Karst Component and buffer zone**



**Map 5: Guilin Karst Component and buffer zone**



**ASIA / PACIFIC**

# **CAT BA ARCHIPELAGO**

**VIET NAM**





# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## CAT BA ARCHIPELAGO (VIET NAM) – ID No. 1451

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** Not to inscribe the property under natural criteria.

**Key paragraphs of Operational Guidelines:**

Paragraph 77: Nominated property does not meet relevant World Heritage criteria.

Paragraph 78: Nominated property does not meet integrity.

**Background note:** Although this specifically nominated area has not been previously considered by the World Heritage Committee, the 1993 IUCN evaluation for the then Ha Long Bay nomination recommended “*The (Ha Long Bay) boundaries as presented in the nomination need some adjustment to better encompass the features of World Heritage quality*” and “*Added to the site should be the islets adjacent to Cat Ba Island which form part of the National Park but are found in the adjacent province of Haiphong*”. IUCN consequently recommended at the time that the Ha Long Bay nomination be deferred to address these boundary issues; however, the Committee inscribed Ha Long Bay without any recommendations concerning additional areas adjacent to Cat Ba Island.

### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 20 March 2013

**b) Additional information officially requested from and provided by the State Party:** None requested

**c) Additional literature consulted:** Various sources, including many sources of local web-based information, IUCN Red List ([www.iucnredlist.org](http://www.iucnredlist.org)), references as noted in the nomination, and additional sources including: Azzini, Francesca, Calcinai, Barbara, Cerrano, Carlo, Bavestrello, Giorgio, Pansini, Maurizio (2007) **Sponges of the marine karst lakes and of the coast of the islands of Ha Long Bay** (North Vietnam). Porifera research: Biodiversity, innovation and sustainability – 2007; Cerrano C., Azzini F., Bavestrello G., Calcinai B., Pansini, M., Sarti, M. Thung, D (2006) **Marine lakes of karst islands in Ha Long Bay** (Vietnam) Chemistry and Ecology. Vol 22, No.6, December 2006. Primate Specialist Group - Cat Ba Langur <http://www.primatesg.org/storage/PDF/Golden-headed%20Langur.pdf>. Waltham, Tony (2000) **Karst and Caves of Ha Long Bay Speleogenesis and Evolution of Karst Aquifers**. The Virtual Scientific Journal ISSN 1814-294X [www.speleogenesis.info](http://www.speleogenesis.info) [http://www.speleogenesis.info/directory/karstbase/pdf/seka\\_pdf9536.pdf](http://www.speleogenesis.info/directory/karstbase/pdf/seka_pdf9536.pdf). Williams, P. (2008) **World Heritage Caves and Karst**, International Union for the Conservation of Nature, Gland

**d) Consultations:** 11 desk reviews received. The IUCN field mission met with the Deputy Prime Minister of the Socialist Republic of Viet Nam and senior officials from the Ministry of Culture, Sports and Tourism and the Ministry of Foreign Affairs. The mission also interacted extensively with various officials from the Province of Hai Phong including the Chairman of Hai Phong People’s Committee and the Secretary of Cat Hai District’s Party.

Other meetings took place with Hai Phong Provincial government officials including the Departments of Culture, Sports and Tourism; Transportation; Agriculture and Rural Development; Finance; Natural Resource and Environment; Home Affairs; Planning and Investment; Construction; Science and Technology; Foreign Affairs; Information and Communication; Police, Military and Border Protection. Consultation also occurred with various experts, research institutes, projects and associations such as the Institute of Marine Environment and Resources; Vietnam Association of Zoology; Vietnam Association of Entomology; Cat Ba Langur Conservation Project; and many other stakeholders.

**e) Field Visit:** Peter Hitchcock and Gayatri Reksodihardjo-Lilley, 28 September - 3 October 2013

**f) Date of IUCN approval of this report:** March 2014

### 2. SUMMARY OF NATURAL VALUES

The nominated property Cat Ba Archipelago (CBA) is a sub-set of the greater Ha Long Bay archipelago, comprising coastal limestone islands formed over a long geological period. It represents important tropical and sub-tropical marine and insular ecosystems, which have evolved in isolation from the mainland. CBA, some 164 kms east of Hanoi, includes a mix of primary tropical forest, flooded forest, caves, mangrove forest, tidal flats, coral reefs, and marine lakes. It is also the habitat of the Cat Ba subspecies of the White Headed Langur (*Trachypithecus poliocephalus poliocephalus*), a critically endangered primate, only found in Cat Ba, and the Guangxi region in China.

Cat Ba is part of the larger Ha Long Bay/Gulf of Tonkin region, the largest ecosystem of limestone islands and islets in Southeast Asia. In 2004 Cat Ba Island was

designated as a UNESCO Biosphere Reserve. Cat Ba National Park was declared as Vietnam's first national park which included both land and marine ecosystems. About 40% of the nominated property is terrestrial, while 60% is in the marine realm. The nominated property encompasses 33,670 ha (including a marine area of 20,192 ha) and includes a buffer zone to the south-west of 13,000 ha (including a marine area of 9,016 ha).

Vietnam has two natural World Heritage sites: Ha Long Bay and Phong Nha-Ke Bang National Park. The Ha Long Bay World Heritage site is directly adjacent to Cat Ba, while Phong Nha-Ke Bang National Park is found on the mainland close to the border with PDR Lao. CBA is not recognized as a distinct geographic entity but rather is a construct for the purpose of the nomination; in reality it is an integral part of the more extensive island archipelago of Ha Long Bay.

CBA sits within the Ha Long Bay geographic entity which extends across of broad sweep of semi-sheltered waters in the Gulf of Tonkin. It is characterized by hundreds of spectacular limestone karst islands often featuring rocky cliffs rising direct from the water. As such it is recognized as an outstanding example of a marine invaded karst landscape. The islands range from small tooth-like rocky pinnacles through to larger islands, the largest of which is Cat Ba Island. The size of the islands and their geomorphological complexity tends to range from the smallest and simplest in the eastern part of Ha Long Bay through increasing size and complexity westward to Cat Ba Island in the west. Many of the geomorphological features found in the Cat Ba nomination area are similar to and complementary to those found in Ha Long Bay and arguably CBA includes some better examples of such features as marine lakes within islands.

According to the nomination dossier, CBA contains some 1,561 higher plant species along with a faunal assemblage of 53 mammal, 155 bird, 45 reptile, 21 amphibian, 11 freshwater fish and 196 marine fish species. The Cat Ba Island component of the nomination is clearly the largest terrestrial component of the nominated property and indeed the largest island in the whole of the Ha Long Bay landscape. As such Cat Ba Island exhibits a greater number of terrestrial plant and animal species and contains the largest stand of intact tropical rainforest. Cat Ba Island also has the greater number of larger mammals including the local endemic, critically endangered flagship species, the Cat Ba Langur. The langur population is estimated to be as low as 63 individuals in a number of separate groups. An internationally supported langur team has now moved into a critical stage including the recent translocation of a number of non-breeding individuals to link up with other groups that have a better prospect for breeding. Although presently classified as a sub-species of the White Headed langur found in similar habitat in southern China, it is likely to be considered for full species status. It is one of the most endangered primates in the world.

Out of the 53 mammal species inventoried, at least 3 are listed as threatened on the IUCN Red List: the White Headed Langur noted above (Critically Endangered - CR), Asian Small-clawed Otter (*Aonyx cinerea*, Vulnerable - VU) and Sumatran Serow (*Capricornis sumatraensis*, VU). There is also one threatened species of reptile: King Cobra (*Ophiophagus hannah*, VU). In terms of marine species, three threatened sea turtle species are found in Cat Ba: the Hawksbill Turtle (*Eretmochelys imbricata*, CR), Leatherback (*Dermochelys coriacea*, CR) and Green Turtle (*Chelonia mydas*, Endangered - EN). There are therefore a total of three Critically Endangered vertebrate species found in Cat Ba.

Cat Ba possesses a notable list of terrestrial plant species, though only a few were found to be truly endemic to the Cat Ba – Ha Long landscape. One distinctive palm tree species, *Livistona halongensis*, is endemic to the islands of Ha Long Bay including Cat Ba Island. In addition one newly discovered cycad has so far only been found in Cat Ba and Ha Long bay: *Cycas tropophylla*, which is classified as Near Threatened (NT) on the 2013 IUCN Red List.

### 3. COMPARISONS WITH OTHER AREAS

The property has been nominated under criteria (ix) and (x). The nomination dossier therefore focuses strongly on these two criteria although it is apparent that the nominated area has distinct values that relate to criteria (vii) and (viii), the same two criteria under which Ha Long Bay is inscribed. Consistent with the views of the field evaluation mission, UNEP-WCMC and the IUCN Panel, several reviewers also noted that the case for Cat Ba can only be made if it were considered to be part of an extension to Ha Long Bay. Reviewers pointed to the misconception within the nomination dossier that Cat Ba is geologically different from Ha Long Bay. They reinforced that both Cat Ba and Ha Long Bay share a common geological history with similar earth science attributes with the exception that Cat Ba may include some better marine lake systems. IUCN considers the approach taken to selecting criteria for the nomination is fundamentally flawed (see further at Additional Comments below).

Whilst a comparative analysis has been provided within the nomination dossier, IUCN considers this to be weak given that some of the sites cited are not readily comparable. The nominated property is compared with 11 existing World Heritage sites; however, several sites are in very different climatic and/or ecological contexts such as Shiretoko and the Ogasawara Islands, Japan, in the temperate region, and the semi-arid Ningaloo Coast, Australia. Further the most obvious comparative analysis with the immediately adjoining Ha Long Bay site is superficial, and based on false premises about 'ecological barriers' and therefore inaccurate.

In addition, the nomination's comparative analysis is seriously flawed as many of the species data presented for the property are incorrect. For example, the list of plants presented as Cat Ba endemics were researched by the IUCN field mission and none were considered to be endemic to Cat Ba and only two (*Livistona halongensis* and *Chirita modesta* - new name *Primulina*) were found to be Ha Long Bay endemics. The *Livistona* is found on many islands in Ha Long including Cat Ba, but is not limited to CBA. The critically endangered *Chirita/Primulina* is confined to May Den Island in Ha Long Bay with no record in CBA. Of the several fauna species presented as Cat Ba endemics, only two taxa were demonstrably local Cat Ba endemics – the Cat Ba Langur and the Cat Ba Leopard Gecko.

Comparative analysis undertaken by UNEP's World Conservation Monitoring Centre (UNEP-WCMC) in conjunction with IUCN noted that Cat Ba's values are similar to the adjacent Ha Long Bay as both areas lie within the same biome, biogeographical province, same terrestrial ecoregion and same marine ecoregion. Global 200 ecoregions and global biodiversity hotspots are already well-represented by other sites in these regions. UNEP-WCMC point to the importance of Cat Ba with respect to the habitat of the White Headed Langur, which is a critically endangered primate, with one of only two subspecies exclusively found in the nominated property. It is also home to other endemic or globally threatened species including the Asian Small-clawed Otter, Sumatran Serow, and King Cobra, as well as three species of sea turtles. UNEP-WCMC conclude that compared to the Ha Long Bay World Heritage property, CBA appears to have a higher overall biodiversity and could therefore provide complementary values to the existing natural World Heritage site of Ha Long Bay in terms of possible recognition of the overall biodiversity values of Ha Long Bay, and in the Gulf of Tonkin.

Regarding the marine environment it is noted that Cat Ba and Ha Long Bay also effectively share the same marine ecosystem. Comparative analysis of the Cat Ba marine with Ha Long marine environment therefore fails to identify any significant differences between the two areas, and complementary marine values exist in both Ha Long Bay World Heritage property, and the nominated property.

In conclusion on criterion (ix), the case as presented is seriously flawed as many of the species data are inaccurate and there is no case for CBA being a centre of endemism or evolutionary processes in insular systems. On criterion (x) the marine component does not stand alone as it is not significantly distinct from Ha Long Bay nor would Cat Ba meet this criterion on the basis of the existence of one sub-species of langur, despite its high conservation importance and critically endangered status. Most of the species claimed as significant are not endemic to CBA alone, not globally threatened and the nominated property is not a critical habitat for those species. Fundamentally however, the nomination is flawed by presenting CBA, erroneously, as separate

from the adjacent Ha Long Bay World Heritage Site when it is in fact an integral part of the Ha Long Bay/Gulf of Tonkin Region.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

The nomination dossier emphasizes a comprehensive framework of legal protection and management although these are a combination of National and Provincial regulations. There appears also to be significant involvement by the Cat Hai district in aspects of marine tourism and the nominated property. Similarly, there is substantial bureaucracy engaged in aspects of protection and management, including a separate agency for management of the Biosphere Reserve. Some reviewers have raised concerns regarding confused responsibilities between the different agencies within the overall management structure.

All land within the nomination is State owned. Six communes relate to the property boundaries with 16,566 people resident on Cat Ba Island and a number of floating villages of 4,000 people. 40% are considered poor and most people live within the identified buffer zone. Only 210 people live inside the nominated area within the long standing Viet Hai Commune. The State, via Hai Phong Province, exercises control over these areas and occupiers of the mangrove aquaculture areas are paid an allowance for management of the lands.

IUCN considers that the legal protection status of the nominated property meets the requirements of the Operational Guidelines.

### 4.2 Boundaries

The boundaries of the nominated area are generally adequate for protection of the identified values of CBA, both terrestrial and marine. However, several anomalies exist including the north western boundary which excludes the valley and harbour of the Gia Luan Commune, creating a deep enclave in the nominated property. The north western boundary of the nominated area has not been harmonized with the immediately adjoining Ha Long Bay World Heritage site, leaving a group of spectacular karst islands wedged between the two boundaries (Mom Lon Islet and adjacent islands opposite Gia Luan Harbour). Finally the boundary of the Biosphere Reserve and the World Heritage nomination do not appear to be harmonized which may lead to confusing regulation and management.

The absence of a buffer zone on the north side of the nomination, including the Gia Luan valley and estuary is a deficiency and the designated buffer zone on the south-western side of the nominated area is of questionable relevance given that it includes major urban, tourism and port development. The marine

boundary of the buffer could only be described as arbitrary, especially at its most seaward extent.

The internal zonations in the nomination appear logical and appropriate for conservation of the identified conservation values for at least the terrestrial environment. However, the mission considered that some of the activities (e.g. sea kayaking and floating fish farms) observed in the marine component of the core area were not consistent with a 'core zone' designation which would normally prohibit most activities. The boundaries of the Marine Protected Area deserve review in conjunction with the adjoining Ha Long Bay World Heritage site.

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

#### 4.3 Management

The Cat Ba Archipelago Management Commission was created to assume overall responsibility for management of the proposed World Heritage site. Within this framework the Cat Ba National Park; Cat Ba Bay; and the Cat Ba Biosphere Reserve are managed by respective Management Boards. Staffing capacity and skills appear adequate for effective management. Funding also appears to be adequate with currently no serious financial constraints on management. Capital investment is taking place within Cat Ba, for example a large new headquarter complex for the National Park is approaching completion. The area has also received significant international support with a stated 29 projects during the period 2006-2011.

A draft Management Plan covering the nominated property was submitted with the nomination and is awaiting approval presumably subject to a successful inscription. The plan covers the period 2013-2017 with a longer term vision to 2025 and appears to provide an umbrella for existing planning within the component protected areas comprising the nomination. The plan restates information within the nomination and is deficient in relation to specific management actions and timetables.

The matter of transboundary management with the immediately adjoining Ha Long Bay World Heritage property is a key issue because of the intimate interface of the marine environment and the movement of tourist boat traffic across the common boundary. Evidence of some limited cooperation between the management of the two areas was ascertained by the mission, such as an agreement for rangers to cross the boundary by up to 200 metres and for conditional entry of Ha Long World Heritage boats into CBA waters. The mission suggested that there could and should be a great deal more collaboration on management planning and management. It was suggested to CBA representatives that it would be desirable to at least implement an integrated strategic management planning process, in

particular to develop a strategic tourism master plan or similar; however, provincial authorities responsible for CBA indicated they regarded such levels of collaboration and cooperation as unnecessary. IUCN fundamentally disagrees with that perspective, and considers such cooperative management to be essential.

Whilst management of the nominated property is adequate for its conservation, IUCN considers the nomination does not meet the management requirements of the Operational Guidelines.

#### 4.4 Community

The mission considers that governance and co-management arrangements are complicated and difficult to evaluate, particularly the overlap between the Management Boards of the Cat Ba Bay Biosphere Reserve, and Cat Ba National Park.

Governance arrangements seem to be subject to a myriad of regulations and appear overly complex, bureaucratic and involving sundry agencies. Numerous pieces of national and provincial legislation and regulations apply to the nominated area and it is not at all clear just to what extent the enforcement of these various regulatory mechanisms are integrated, particularly on site. The draft management plan submitted with the nomination concedes that *“many regulations and rules are still inadequate and inconsistent, and some of the guidelines and orientations need to be amended and added (to) in terms of protection and conservation of rare and precious species of plants and animals, marine aquaculture, environment, tourism service, husbandry, forest protection, etc. It is necessary to amend and add those legal documents in order to protect the integrity of the property.”*

Community groups met by the mission did not comment on matters of consultation and consent-seeking in relation to the nomination. Much of the decision making relating to the larger issues of the nominated area is made by the Hai Phong Peoples Committee and in some cases the Cat Hai district. Livelihood and benefit-sharing rights appear to be limited to those enjoyed by occupiers of the mangrove aquaculture area in the north.

#### 4.5 Threats

Most of the terrestrial component of the nominated area has not been subject to significant development. Though some areas have been logged for timber in the past there is no evidence of recent logging activities. The area has been subjected to extensive on-going hunting pressure, including poaching of the now critically endangered Cat Ba Langur and the Cat Ba Leopard Gecko. The Cat Ba Langur's population was estimated at 2,400-2,700 individuals in the 1960s, but was reduced to around 50 individuals by 2000, almost entirely due to hunting for the medicine trade. The population has stabilised and is slowly increasing due largely to the dedicated work of the Cat Ba Langur Conservation

Project, through their capacity-building and education activities with local authorities, community groups and schools. For similar reasons there has also been a population collapse of the serow (*Capricornis midneedwardsii*), a goat-like antelope which has fallen from an estimated 500 to less than 30 in 20 years. There are unconfirmed reports that some hunting/poaching of reptiles for traditional medicine markets and the pet trade continues. Elimination of hunting from the terrestrial environment will only be achieved by on-going surveillance and law enforcement. Apart from the on-going management issue of illegal hunting, most of the values of the terrestrial environment of the nominated area appear to be little threatened. There is a long established national park management unit for most of the land within the nomination.

Most of the mangrove component at the northern end of the nomination has been subjected to extensive development for aquaculture and so has substantially lost integrity as a natural system. Impacts include extensive bunding and installation of water level regulator gates. The State Party advised the IUCN mission that all of the bunds and gates would be removed as part of a rehabilitation plan. Very little of the mangrove in the nomination is in a pristine condition but the developed sections would be quite capable of rehabilitation to a natural water regime.

The marine environment of the nominated property can be assumed to be subject to much the same threats as has been documented for Ha Long Bay World Heritage site, such as coal and silt inwash from the mainland, including from the Red River, a large river with a major silt plume extending around both sides of Cat Ba Island.

Construction of a major new Hai Phong Port has reached final decision stage. The port facility is to be constructed at the seaward entrance of the main channel of the Red River, adjacent to the north-west corner of Cat Ba Island. IUCN is concerned about the impact of proposed sea dumping of a large amount of dredge spoil which could mobilize and move towards Cat Ba Island, in particular the mangrove areas.

Marine tourism is well established within the nominated area and overlaps with the substantial marine tourism in the immediately adjoining Ha Long Bay site. In the last ten years, annual visitor numbers have increased from 250,000 to over one million. Tourism is reported to have increased by five to seven times since recognition as a biosphere reserve and people on the island are now concerned with the effects of the tourism industry. Whilst there was some evidence of limited cooperation between Cat Ba and Ha Long on tourism, there is clearly a need for much greater collaboration and integrated planning to ensure environmentally sustainable tourism occurs within the shared waters.

Whilst assurances were given about strict rules on pump out of sewage and other waste from tourist boats, these

could not be confirmed. The current marine tourism activities taking place within the nominated property need to be reviewed for consistency with core zone designation and an assessment made of potential threat to the langur population in immediately adjacent terrestrial areas.

Concerns are noted regarding impacts from the main Cat Ba township. These include waste water capacity and treatment resulting in release into the surrounding waters; solid waste management being disposed into two landfills; and floating rubbish from fish farms. A housing estate and tourism development named 'Amatina' has been under way for several years involving the reclamation of many square kilometres of tidal land along the foreshore of Cat Ba Town skirting the biosphere reserve boundary. This development is reportedly on hold due to the impact of the global financial crisis but a large amount of land quarrying and land reclamation has taken place. Concerns relate to the large scale of the development, including a large marina with the potential to impact on water quality and boat-based marine tourism in the nomination, and indeed in Ha Long Bay. The IUCN Mission was informed that all sewage from the project would be processed off site and not allowed to enter the sea adjacent to the Cat Ba nomination. Whilst the Amatina project does not directly impact on the nominated area, the issues of water discharge and generation of major increases in boat traffic into the nominated area and Ha Long Bay needs closer study.

Another large development named 'Venus Cat Ba' which also requires the reclamation of tidal and wetlands as well as leased agricultural land, is awaiting official approval. The scale of present and impending development on Cat Ba indicates the need for a regime of ongoing water and ecosystem monitoring, particularly considering the fragility of fringing reef systems and threat to the local economy.

In conclusion IUCN considers that the integrity and protection and management requirements set out in the Operational Guidelines are not met.

## 5. ADDITIONAL COMMENTS

### 5.1 Relationship to Ha Long Bay World Heritage Property, and to natural criteria (vii) and (viii)

IUCN notes the fundamental issue that the nominated property is in the same geographical area as the existing Ha Long Bay World Heritage property, currently inscribed under natural criteria (vii) and (viii). The present nomination of CBA appears to have not selected those criteria for consideration in order to differentiate CBA from the existing Ha Long Bay property. IUCN considers this is a fundamentally flawed basis on which to make a case for possible World Heritage status in relation to CBA.

Although not nominated against criterion (vii), CBA shares the same features of natural beauty for which Ha Long Bay qualified for World Heritage. Given the intimate visual association between CBA and the Ha Long Bay site, there is no doubt that it is both a geographical reality, and an immediately apparent perception for visitors, that Cat Ba Island and associated smaller islands are an integral part of the Ha Long Bay site. For example, many of the ‘Ha Long Bay’ tourist boats pass along the northern edge of the Cat Ba nomination, some entering Cat Ba waters for activities such as sea kayaking. Had Cat Ba been nominated as an extension of Ha Long, it would have readily been able to make a compelling and obvious case to add an important contribution to the integrity of the existing World Heritage Site in relation to criterion (vii).

Similarly, although not nominated against criterion (viii), CBA shares with the immediately adjoining Ha Long Bay World Heritage site outstanding karst geomorphology for which Ha Long qualified. Had Cat Ba been nominated as an extension of Ha Long, it would have readily been able to make a case that it provides an important contribution to the integrity of that site and possibly added karst attributes to those of Ha Long. In particular, taken with Ha Long Bay, there is a natural sequence from the Fenglin karst, through Fengcong with a full range of karst island formations, culminating in Cat Ba Island as the most substantial land mass in the area. For example, a large peninsula on the south east of Cat Ba is graphic evidence of sea invasion but where the ‘island’ remains tenuously attached via a low rocky isthmus to the ‘mainland’ of the island. This peninsula also contains arguably the most graphic and outstanding series of marine lakes in the whole Ha Long – Cat Ba region – a feature cited in the listing of Ha Long Bay but which appears to be even better represented in CBA than in the existing property.

Bathymetric maps confirm that there is shallow water connectivity around the head of this channel, linking the marine areas of the nomination to those of Ha Long Bay. It is therefore reasonable to conclude that the waters of Ha Long Bay and the Cat Ba nomination are interchanged and there is effective ecological marine connectivity between the two areas.

In relation to biodiversity criteria, consideration of CBA in conjunction with Ha Long Bay World Heritage Site might also be able to provide justifications that alone CBA does not provide. The opportunities to reconsider CBA in the context of Ha Long Bay, and the Gulf of Tonkin, are a consistent position from IUCN, the IUCN field mission, and reviews of the nomination.

## 6. APPLICATION OF CRITERIA

**Cat Ba Archipelago** has been nominated under natural criteria (ix) and (x).

### **Criterion (ix): Ecosystems/communities and ecological/biological processes**

The case made for qualification against criterion (ix) for CBA is seriously undermined by inaccuracies in reported species data and exaggerated levels of endemism and habitat specificity. The values of the nominated property are very similar to the adjoining Ha Long Bay World Heritage site and the two areas are clearly complementary. As a stand-alone nomination Cat Ba also lacks the necessary integrity to be inscribed.

Similarly, the claims about the range and juxtaposition (sequence) of ecosystems in the terrestrial environment are not a valid argument and merely demonstrate the fact that there is geographic, habitat and ecosystem diversity within the nominated property. There appears no substantive case for CBA alone being a centre of endemism or a place which demonstrates exceptional evolutionary processes for insular ecosystems. Similarly the marine values of the nominated property are clearly complementary to the adjoining Ha Long Bay site.

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

### **Criterion (x): Biodiversity and threatened species**

For the purpose of evaluation against criterion (x) the marine component is substantially discounted on the basis that the marine environment enjoys full connectivity with the immediately adjoining Ha Long Bay World Heritage property. Accordingly, apart possibly from any localised biodiversity associated with the small offshore Long Chau island group, marine biodiversity in Cat Ba is not distinguishable alone as being of Outstanding Universal Value.

The nomination places a lot of emphasis on the existence of the Cat Ba Langur, a critically endangered animal (sub species of White Headed of mainland) to argue the case for qualification against criterion (x). The very survival of this taxon is by no means assured. Notwithstanding the iconic status of the animal at the local level and the praiseworthy efforts to conserve this important sub species, IUCN does not consider that the presence of this sub species alone is sufficient to warrant listing against criterion (x).

A large sample of plant and animal species listed as ‘endemics’ under criterion (ix) were investigated and found to be widely distributed and so not endemic to Cat Ba nominated area. For example the selection of plant and animal species cited in the nomination as being the 76 species on the IUCN Red List were examined for international conservation scientific significance. Most of the species in that sample were found to be not endemic to Cat Ba, not globally threatened and Cat Ba was not critical or important habitat for those species.

In conclusion no substantive evidence exists for the Cat Ba Archipelago nomination qualifying alone against criterion (x). The large number of species cited as threatened species was found to be an inaccurate

representation of species of conservation importance. The conservation importance of the Cat Ba Langur, a critically endangered species, is acknowledged but not considered an adequate basis for stand-alone listing of the nominated area.

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

IUCN further notes, as discussed at point 5 of this report, that CBA would have potential to be considered as a viable extension of Ha Long Bay World Heritage property, under criteria (vii) and (viii), and such a configuration might also provide the opportunity to consider whether a larger property might have potential to meet other natural biodiversity criteria, with a potentially stronger case for criterion (x), but requiring further study. As a prerequisite for a possible extension it would be essential to address a range of threats, and for the relevant provincial authorities to increase greatly their level of cooperation and joint management.

## 7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC-14/38.COM/8B and WHC-14/38.COM/INF.8B2;

2. Decides not to inscribe **Cat Ba Archipelago (Viet Nam)** under natural criteria (ix) and (x).

3. Takes note that Cat Ba Archipelago is adjacent to the existing Ha Long Bay World Heritage Site and both are a part of the same archipelago sharing both inland and marine areas, and sharing a common marine boundary of more than 20kms.

4. Recommends the State Party to consider the possibility of proposing an extension of Ha Long Bay, under criteria (vii) and (viii) and possibly criterion (x), to include Cat Ba Archipelago, as this would add values and improved integrity to the existing inscribed property of Ha Long Bay. The State Party is also recommended to evaluate the possibility of including other important karst areas in Viet Nam in a serial extension of Ha Long Bay.

5. Draws the attention of the State Party to the range of severe threats to the nominated property, and within the wider Ha Long Bay area, and recommends the State Party to take action to address these concerns prior to the submission of any further nomination or extension. Threats to be addressed include:

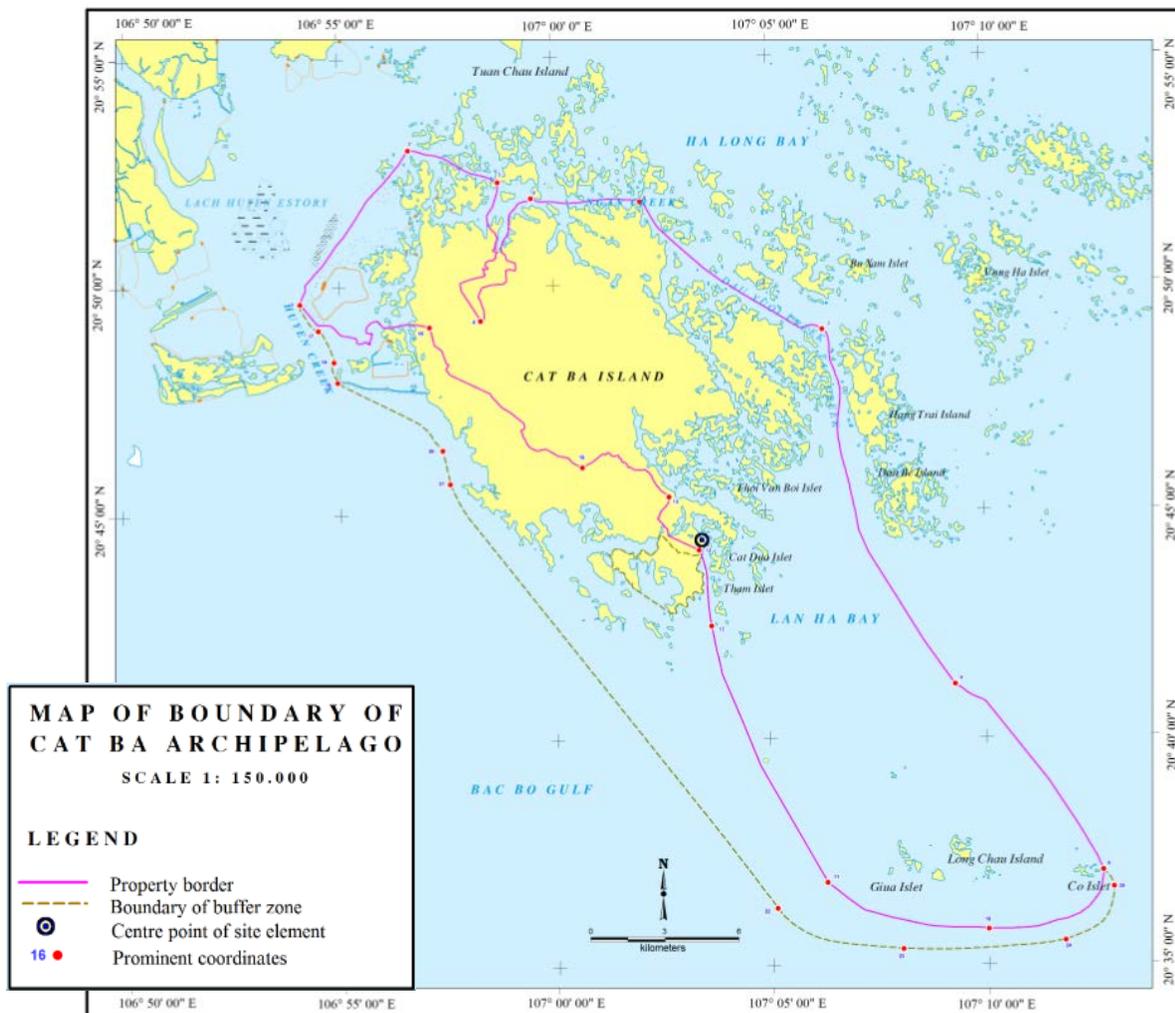
- a) poaching and hunting impacts on Cat Ba Langur to ensure fragile recovery efforts are not compromised;
- b) tourism use pressure and associated boating impacts;
- c) large scale tourism development with potential for serious reclamation, pollution and overuse impacts;
- d) water and solid waste pollution impacts from major urban centres such as Cat Ba Town;
- e) dredging spoil and industrial waste disposal impacts from the development of the new Hai Phong Port facility; and
- f) pollution impacts from unregulated fish farm development.

6. Strongly encourages the State Party to strengthen and continue its efforts in conservation of the Critically Endangered Cat Ba Langur, which has been reduced to some 60 remaining individuals, and to ensure that management of Cat Ba creates the conditions to allow an increase in the numbers of this species.

**Map 1:** Nominated property location



**Map 2:** Nominated property and buffer zone



**EUROPE / NORTH AMERICA**

**WADDEN SEA  
(Extension of the “Wadden Sea”, Germany / Netherlands)**

**DENMARK / GERMANY**





# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## WADDEN SEA (DENMARK / GERMANY) – ID No. 1314 Ter

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** To approve the extension under natural criteria.

**Key paragraphs of Operational Guidelines:**

Paragraph 77: Nominated property meets World Heritage criteria.

Paragraph 78: Nominated property meets integrity or protection and management requirements.

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

In 2008 Germany and the Netherlands resubmitted a joint nomination and the Committee, at its 33rd Session (Seville, 2009), inscribed the Wadden Sea (Germany/Netherlands), on the World Heritage List under natural criteria (viii), (ix) and (x) (decision 33 COM 8B.4), covering an area of 968,393 ha. In 2010 Germany and the Netherlands submitted a Minor Boundary Modification to include the Hamburg Wadden Sea National Park (13,611 ha) which was approved by the Committee at its 35th Session (Paris, 2011, decision 35COM 8B.47). Thus the property now covers an area of 982,004 ha.

The Committee, at its 33rd Session (Seville, 2009) and at its 35th Session (Paris, 2011) encouraged the States Parties of Germany and the Netherlands to work with the State Party of Denmark and consider the potential for nominating an extension of the property to include the Danish Wadden Sea. A range of additional recommendations were also made regarding the property, and the relevant decisions are 33 COM 8B.4 and 35COM 8B.47.

In response to the World Heritage Committee's recommendations, the State Parties of Germany, the Netherlands and Denmark submitted in January 2013 a nomination to extend the Wadden Sea World Heritage property (968,393ha), to include most of the Danish Wadden Sea Conservation Area, and a further area offshore of the German Wadden Sea in Lower Saxony.

### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 20 March 2013

**b) Additional information officially requested from and provided by the State Party:** Following the technical evaluation mission the State Party was requested to provide supplementary information on 13 December 2013. The information was received on 26 February 2014.

**c) Additional literature consulted:** Christensen, S. M. (2008). **Case study 5 - Wadden Sea National Park Pilot, Denmark.** Scottish Natural Heritage Research, Annex to Commissioned Report No. 271. Christensen, S. M. (2008). **Case study 4 - Wadden Sea National Park - Schleswig- Holstein Area,** Germany. Scottish Natural Heritage Research, Annex to Commissioned Report No. 271. Dettmann, C., and Enemark, J. (2009). **The Wadden Sea wetlands: A multi-jurisdictional challenge.** In *Sustaining the world's wetlands*, ed. R.C. Smardon, 21–56. Springer Science, New York. Ens, B. J., Blew, J., van Roomen, M.W.J., and Turnhout van, C.A.M. (2009). **Exploring contrasting trends of migratory waterbirds in the Wadden Sea.** Wadden Sea Ecosystem No. 27. Common Wadden Sea Secretariat, Trilateral Monitoring and Assessment Group, Joint Monitoring Group of Migratory Birds in the

Wadden Sea, Wilhelmshaven, Germany. Goeldner, L. (1999). **The German Wadden Sea coast: reclamation and environmental protection.** *Journal of Coastal Conservation* 5:23-30. Hötter, H., Schrader, S., Schwemmer, P., Oberdiek, N., and Blew, J. (2010). **Status, threats and conservation of birds in the German Wadden Sea.** Technical Report NABU. JMBB (2013). **Breeding Birds in Trouble: Preparation of an action plan for proper management of threatened breeding birds in the Wadden Sea.** Joint Monitoring Breeding Bird Group Workshop Report, Wilhelmshaven. Kempf, N., and Kleefstra, R. (2013). **Moulting Shelduck in the Wadden Sea 2010 – 2012: Evaluation of three years of counts and recommendations for future monitoring.** Common Wadden Sea Secretariat, Trilateral Monitoring and Assessment Group and Joint Monitoring Group of Migratory Birds in the Wadden. Kröncke, I., Zeiss, B., and Rensing, C. (2001). **Long-term variability in macrofauna species composition off the island of Norderney (East Frisia, Germany) in relation to changes in climatic and environmental condition.** *Senckenbergiana Maritima* 31: 65–82. Kröncke, I., Reiss, H., and Dippner, J.W. (2013). **Effects of cold winters and regime shifts on macrofauna communities in the southern North Sea.** *Estuarine, Coastal and Shelf Science* 119: 79-90. Laursen, K., Hounisen, J.P., Rasmussen, L.M., Frikke, J., Pihl, S., Kahlert, J., Bak, M., and Amstrup, O. (2009). **Rastende**

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**d) Consultations:** 7 desk reviews received. The mission also met with representatives from the Nature Agency, Denmark; from the Common Wadden Sea Secretariat, Germany; from the Coastal Authority in Denmark; from the Nature Centre; from the Common Wadden Sea Office; the Federal Ministry and several State Ministries of Germany; from the National Park Niedersachsenthe; from the Wadden Sea Visitor Centre; the Ministry of

Economic Affairs, Agriculture and Innovation; the Ministry of Economic Affairs, Agriculture, and Innovation, Regional Policy Department North; Mayors of the Tønder, Esbjerg, and Fanø Municipalities; Ornithological Society; Hunters Association; Agricultural Society; Military Commander; and many other stakeholders.

**e) Field Visit:** Dr Wendy Strahm and Dr Oliver Avramoski, 19-23 August 2013

**f) Date of IUCN approval of this report:** March 2014

## 2. SUMMARY OF NATURAL VALUES

The Wadden Sea, which covers the intertidal zone in the south-eastern part of the North Sea, is considered to represent the largest unbroken system of tidal sand and mud flats worldwide with natural dynamic processes proceeding in a widely unimpaired natural state. The proposed extension encompasses and complements all the biophysical and ecosystem processes that characterise the Wadden Sea. It includes most of the Danish Wadden Sea Conservation Area (DWSCA; 121,616 ha) at the most northern part of the Wadden Sea, and an offshore extension of the Lower Saxony Wadden Sea National Park, Germany (WSNPLS; 40,628 ha). The location and size of both the inscribed and nominated component parts of the property were provided in the nomination dossier (table 1). The total area of the property if the proposed extension is approved will amount to 1,143,403 ha. No buffer zone to the nominated property is proposed.

The DWSCA was designated by Statutory Order on the Nature and Wildlife Reserve Wadden Sea, 1982 and its later amendments. The boundaries of this area are mostly delimited by man-made dikes along the mainland coast and surrounding the three inhabited islands of Rømø, Mandø and Fanø, with one small area inland of the dikes included (most of the artificially managed wetland of Margrethe Kog which was reclaimed in 1982). In the few areas that are not diked, the area is delimited by the highest daily water level including the high sands. Offshore the nominated property is delimited by the 3 nautical sea mile boundary. The state boundary between Denmark and Germany constitutes the southern boundary of the proposed extension. In the north, the proposed extension includes the peninsula of Skallingen and the Ho Bay. Some of the state-owned parts of the islands such as the beaches of Rømø are included in the nomination. The proposed extension does not include the shipping lane to Esbjerg, the military exercise area on the island of Rømø, a small area around the Rømø harbour (as there are plans to enlarge the harbour) and a small area in the northern part of the Margrethe Kog reclamation area.

The proposed extension in Denmark includes all habitats which characterize the Wadden Sea – salt marshes, tidal areas including the tidal inlets, channels and gullies, beaches and offshore areas and processes that

exemplify a natural and dynamic tidal flat system. With the exception of some zones of strict protection (such as the main haul-out sites for harbour seals and high water roosts and breeding sites for birds), the existing protection regime for the DWSCA allows access and various extractive and non-extractive human use of the area provided that there are no adverse effects to its natural values. The Danish extension of the property is mainly classified as IUCN Category V, although certain sensitive areas benefit from a more restrictive protection regime.

The proposed new extension of the property in Germany covers the offshore area off the East Frisian Islands and the Elbe-Weser triangle, which coincides with the 2010 extension of the WSNPLS. This area is an important addition to increase the integrity of the existing World Heritage property. The main shipping lane of the Jade-Weser approach, the Traffic Separation Scheme (TSS) and an area of commercial sand extraction on the northern edge of the Elbe-Weser triangle have been excluded from the nominated property. It is entirely owned by the state.

### 3. COMPARISONS WITH OTHER AREAS

The natural values that are present in the proposed extension reaffirm the existing justifications for the property under criteria (viii), (ix) and (x), and the IUCN evaluation from the time of the first inscription of the property provides a comparative analysis which is not repeated here.

The proposed extension includes a number of natural areas that are dynamically and functionally linked to the inscribed property. The proposed extension also strengthens the importance of the inscribed property for the conservation of the flora and fauna of the Wadden Sea as for the inscribed World Heritage property. It also plays a key role for the survival of migratory birds.

A number of attributes particular to the Danish Wadden Sea complement and enhance the elements and processes necessary to express the outstanding universal value of the existing property.

The Danish Wadden Sea constitutes the Northern Wadden Sea region, one of the three major subdivisions based on physical attributes. The Danish extension at the northern rim of the Wadden Sea constitutes the symmetric counterpart to the western Dutch Wadden Sea in the south. It is worth noting, however, that the Danish Wadden Sea receives more sand from the North Sea than most other parts. This may have given rise to a particularly high share of sand bars and plains remaining dry at normal high tide. Furthermore, the Danish Wadden Sea contains fine examples of post-glacial coastal geomorphology. At two areas moraines of a former Ice Age approach the tidal area directly by forming active cliffs. Moraines stemming from glaciation periods are more prominent than in the existing property.

Most salt marshes in the Danish Wadden Sea exhibit a much shorter history of human interference than those in the existing property. Also, the share of unmodified natural shoreline in the Danish Wadden Sea is comparatively higher than in other regions of the existing world heritage property. Most mainland salt marshes in the existing property are man-made and have developed by being protected by brushwood groynes. As a result, their morphology differs to that in natural salt marshes. The area between the Varde River estuary and the peninsula of Skallingen in the far north Ho Bay present important exceptions. The salt marsh at the lee side of Skallingen has developed naturally and demonstrates various transition stages of natural succession. The salt marshes along the shores of Ho Bay have also developed naturally over an area of 10 km<sup>2</sup>. Furthermore, the Varde River entering the Ho Bay basin forms the only estuary in the Wadden Sea not flanked by dikes nor intersected by barriers. The marsh on either side of Varde River is under agricultural use, and only a small margin at the mouth is composed of natural brackish and salt marsh vegetation. Nonetheless, this estuary is a showcase of estuarine development and represents a habitat variety which has been lost or strongly transformed elsewhere in the Wadden Sea. As such it is of exemplary value for the Wadden Sea as a whole.

The offshore extension of the Lower Saxony Wadden Sea National Park (Germany) complements important geomorphological and hydrological elements in the existing property. The proposed extension of the offshore belt in Lower Saxony is part of a complex and highly dynamic eastward sand transport system and sediment-sharing system between offshore belt, barrier islands, estuaries and tidal areas. The offshore belt is also an important spawning site for fish and invertebrate species, as well as for the protection of sea birds and marine mammals, in particular harbour porpoise. The German offshore extension will therefore enhance and strengthen the values, connectivity, completeness and integrity of the existing property.

Given that this nomination is an extension of an existing property, the addition of both the Danish Wadden Sea (which encompasses almost all of the DWSCA) and the German extension (which includes an additional offshore part of the Lower Saxony Wadden Sea National Park) will include elements and processes that complement and strengthen the Outstanding Universal Value of the existing property.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

The proposed extension has adequate long-term legislative, regulatory, formal institutional protection and management in place to ensure that the values and the integrity are maintained. The German extension is part of the Wadden Sea National Park of Lower Saxony and

is designated as a core zone 1, which is the highest protection zone of the National Park. The Danish Wadden Sea is subject to comprehensive protection within the framework of the Statutory Order of the Nature and Wildlife Reserve Wadden Sea established in 1979 and 1982, merged into one Statutory Order in 1992, and amended in 2007. The Danish part of the proposed extension is also part of the Danish National Park Wadden Sea, created in 2010.

Both the German and Danish extensions are fully embedded within the overall trilateral protection and management scheme in the context of the Joint Declaration on the Protection of the Wadden Sea (2010) and the Wadden Sea Plan (2010). The nominated property is subject to protection under the European Union environment legislation, including the Birds Directive, Habitats Directive, Water Framework Directive and Marine Strategy Framework Directive, and is also subject to international protection regimes. It has been designated as a Particularly Sensitive Sea Area by the International Maritime Organisation and the Danish extension is a designated Ramsar site. The nominated property is also included in the African-Eurasian Waterbird Agreement, the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas, and the Seal Agreement under the Bonn Convention.

The extension of the property in Germany is fully owned by the Federal Government. The Danish Wadden Sea is almost entirely state-owned (99%) with adjacent municipalities owning 0.1% and private ownership of 0.9% of the extension.

IUCN considers the protection status of the property meets the requirements of the Operational Guidelines.

## 4.2 Boundaries

The proposed extension of the property comprises all processes and features, including all the habitat types that are typical of the natural processes and dynamic occurring in the Wadden Sea. Upon inscription of the proposed extension, the integrity of the existing property will be enhanced and strengthened significantly. This nomination is therefore in accordance with the decisions of the Committee adopted at its 33rd Session (Seville, 2009) and at the 35th Session (Paris, 2011).

Two issues need to be raised concerning boundaries in the Danish part of the nomination. First, the nominated property follows for the most part the same boundaries as that of the DWSCA (there are exclusions of around 1,000 ha of the DWSCA, including 266 ha at Margrethe Kog, a small area near Rømø Harbour and the shipping lane to Esbjerg). Second, just one area on the inland part of the dike at Margrethe Kog, has been included in the nomination. The reason being that, although it is actively managed, this locality is of great importance as a high-water roosting site for birds.

The management zonation scheme for the Danish extension means that access and hunting is strictly prohibited in some 10% of the proposed extension, but regulated hunting in limited areas will still occur if the property is designated as World Heritage. Motorized transport and any transport propelled by wind power (kite surf, beach buggies) is prohibited except in specifically defined areas (some of which occur in the nominated part of the property); this has a strong visual impact and requires attention and specific management provisions.

The management zonation for the German extension prohibits “all activities which destroy, damage or change the National Park”. However, as a compromise with local stakeholders, shrimp fishing is permitted in this zone, although under restricted conditions and regulations.

With respect to connectivity, there is no problem between the geomorphological, hydrological and ecological connectivity of the open North Sea with the shallow tidal area. On the other hand the Quality Status Report annexed to the nomination (Marencic, 2009) notes that there is a “loss of connectivity between the mainland, especially its rivers, and the Wadden Sea, following the closure and damming of many of the estuaries in the area” which affects species requiring brackish conditions. To mitigate the effect of poor connectivity, actions to restore transition zones between marine and freshwater environments have been proposed, in particular with respect to migrating species such as the houting (*Coregonus oxyrinchus*), a fish species found only in the Danish part of the WSCA.

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

## 4.3 Management

In Germany it is acknowledged that enforcement measures are limited given the size of the nominated property and its limited accessibility. In order to address this situation the National Park of Lower Saxony is developing voluntary agreements with national park partners, aided by wardens employed by coastal protection authorities, volunteers from various NGOs, and the Water Police (the Park itself has no special ranger service). The counties and municipalities also share responsibility for enforcing and largely depend on other authorities for the enforcement of the regulations in the different management zones of the park. Only shipping regulations are controlled by the Federal Ministry of Transport as the marine area is a federal waterway.

The Danish Nature Agency under the Ministry of Environment is the competent authority for the implementation of key legislation in the nominated property in the Danish part of the Wadden Sea, in particular the Statutory Order on the Nature and Wildlife Reserve Wadden Sea as well as relevant EU legislation

and associated monitoring activities. The Nature Agency is therefore the key legal institution which is responsible for the nominated property. This agency has adequate administrative and technical capacity, including a ranger service. The Nature Agency also manages state-owned land in the vicinity of the property, including Natura 2000 sites, although responsibility for the protection of Natura 2000 sites on municipal land is assigned to the local government. The Danish Wadden Sea National Park authority has limited human and technical resources (being created in 2010 and having 5 full-time staff) and delegates policing of the property to the Nature Agency. Management activities and enforcement is supported by a National Park Partners Programme which currently counts 81 partners.

The wider protection of the proposed extension of the property in Germany, outside its boundaries, has been significantly improved through the establishment of the Natura 2000 network and the development of Integrated Coastal Zone Management (ICZM). ICZM is nested in the state planning system, including spatial planning, with responsibilities delegated at all levels of government: state, regional and local.

The recent Danish National Park Plan Wadden Sea 2013-2018 covers the adjacent inland areas beyond the proposed extension's boundary and is expected to play an important role in the integrated planning of the Danish Wadden Sea region. Additional protection in the areas around the property is provided through the management of Natura 2000 sites and also through the implementation of state and local spatial land-use plans. The Danish Spatial Planning Act stipulates that the country's coastal areas are to be kept as free as possible of development and installations that do not need to be located near the coast.

Based on the "Joint Declaration on the Protection of the Wadden Sea" developed in 1982 and updated in 2010, the governments of Netherlands, Germany and Denmark have developed a model system for transboundary management of the WSNCA which fully incorporates the existing World Heritage property and the proposed extension. This system adequately covers all elements of the management planning cycle: (i) development of a management plan (the Trilateral Wadden Sea Plan); (ii) implementation of measures in the management plan; and (iii) monitoring the effectiveness of the management plan (the Wadden Sea Quality Status Report).

The Trilateral Wadden Sea Plan (WSP) represents an adequate management system. It is set out to "serve as the overall management plan to ensure the coordinated management of the Property" for the Wadden Sea World Heritage property. Whilst WSP is a legally non-binding document, its implementation is supported by common political interest and commitment. The implementation of the plan is the responsibility of the three countries in cooperation, and individually, by the competent authorities on the basis of existing legislation and through the participation of interest groups. For example

the Lower Saxony Wadden Sea National Park does not have its own integrated management plan as it has adopted the WSP. The Park has developed management plans for specific issues, such as the Mussel Fishery Management Plan. However it appears that there is no formal mechanism to coordinate the development of similar specific plans in other parts of the property, such as the Wadden Sea National Park of Schleswig-Holstein. Thus there is clear potential to strengthen the specific rolling plans of action needed to implement the overall strategic framework established for the property.

Whilst the Danish National Park Plan Wadden Sea 2013-2018 does not make specific reference to the WSP targets, the objectives of this plan are fully aligned with the WSP targets as the National Park also takes part in the Trilateral Wadden Sea Cooperation. The specific conservation and management activities taking place in the National Park are implemented through the "Danish Statutory Order on Nature Conservation and a Nature Reserve in the Wadden Sea". Whenever necessary, the zoning and the management regulations can be modified by amending the Statutory Order.

The protection of the proposed extension as well as the property from wider threats outside of its boundaries is secured through the transposition of the relevant European Union environment legislation, such as the Birds Directive, Habitats Directive, Water Framework Directive and Marine Strategy Framework Directive.

In relation to financial support for effective management, the nomination dossier listed sources and level of funding in 2012 for the proposed extension. The stated budget in Denmark is 2,500,000€ (which includes funding of the Nature Agency, Municipal Wadden Sea Secretariat, National Park, Coastal Authority and AgriFish Agency), and for the Lower Saxony National Park 3,800,000€ was listed (which includes €1,000,000 for maintenance of 14 Information Centres plus wardens, and also includes NGO funding). These figures do not include important additional budgets for scientific research or specific EU-funded projects. It would appear that this level of funding will be maintained in the long term and, while there are always new demands for funding to enhance management activities, the property is much better funded than many others comparable properties in Europe.

The current annual budget for the Danish Wadden Sea National Park is €1,000,000 and currently its personnel include five permanent staff and some temporary workers. As noted above management activities and enforcement is supported by a National Park Partners Programme which currently counts 81 partners.

The Lower Saxony Wadden Sea National Park receives about €1,000,000 annually for its conservation and management. This funding is provided by a foundation created by the State with two oil companies (Statoil and Ruhrgas).

IUCN considers that the management of the nominated property meets the requirements of the Operational Guidelines.

#### 4.4 Community

The Trilateral Wadden Sea Cooperation provides the overall framework and structure for integrated conservation and management of the property as a whole, even if in each component part of the governance and management is the responsibility of a designated national authority. In Denmark the management authority is the Nature Agency of the Ministry of Environment. In Germany the management authority is the National Park of Lower Saxony.

TWSC also provides a framework for stakeholders' involvement through advisory boards and stakeholder forums. The Wadden Sea Advisory Board (WSAB) is governed by the municipalities and all relevant government and stakeholders. Since the creation of the Danish Wadden Sea National Park, a specific Advisory Board for the National park was created, with a similar composition to the WSAB. The National Park of Lower Saxony also includes an Advisory Board. These boards provide a forum for conflict management and input into management decisions.

Traditional uses of the proposed extension include livestock grazing in salt marshes, fishing of brown shrimp and flatfish using beam-trawling vessels. Traditional hunting of waterfowl, although at a very limited scale, is still allowed in the Danish extension. The Management Principles of the Trilateral Wadden Sea Plan include the principle that "unreasonable impairments of the interests of the local population and its traditional uses in the Wadden Sea Area have to be avoided". In the German part of the extension, small-scale traditional uses by local inhabitants, and in accordance with regional customs and traditions, are allowed. These activities are subject to licensing and environmental assessments in accordance with the Habitats Directive and the Wadden Sea Plan.

Other mechanisms for stakeholder involvement and public participation in the management of the property include mandatory consultation procedures concerning management plans and other strategic documents and participation in the Trilateral Governmental Conference on the Protection of the Wadden Sea (triennial) and the International Scientific Wadden Sea Symposium (triennial).

#### 4.5 Threats

The key existing and potential threats in the proposed extension include (i) invasive alien species; (ii) industrial facilities for energy production (including harbours, dredging, wind farms and submarine cables running through the property, increased air traffic servicing offshore platforms); (iii) maritime traffic; (iv) pollution from land-based sources; (v) limited ecological

connectivity due to coastal flood defense and protection; (vi) residential and tourism development; (vii) resource use (grazing, fishing and hunting); (viii) natural disasters (e.g. floods); and (ix) climate change.

Management responses are in place to deal with these threats although several deserve increased attention due to recorded declines in some of the natural values of the property. For example, monitoring of 34 species of breeding and migratory birds over the past 20 years have shown decreasing trends for 14 species (although increasing trends for 8 species). While the reasons for these trends are not known, it is suspected that the declines may be related to depleted food stocks (especially shellfish); human recreation disturbance; salt marsh, dune and beach management; increased predation; and possibly climate change. Thus whilst some issues are within the control of site managers, others are not. The need to balance the interests of the many stakeholders limits the options to deal with some threats, despite the high level of capacity and willingness by local and national authorities.

The number and density of wind farms outside of the property are impressive and on the increase. However the Wadden Sea Plan (2010) decrees that the construction of wind turbines in the Nature Conservation Area (an area near identical to the proposed extended property as a whole) is prohibited. Furthermore the Wadden Sea Plan decrees that the construction of wind turbines, in the Wadden Sea Area outside the Nature Conservation Area, is only allowed if important ecological and landscape values are not negatively affected; and, in the case of cable corridors, they should be concentrated as to minimize cable crossings through the Wadden Sea, thus ensuring a minimum of cable corridors and a minimum of cables, using the best available techniques and avoiding salt marshes.

Whilst concern have been noted in Denmark by a number of experts on the potential impacts to bird populations from wind farms, a 2006 study based in an intensive monitoring programme conducted between 1999-2006, concluded that the birds in general avoided the wind farms areas and that, whilst some bird species were excluded from some of their traditional feeding areas, the effects on population levels were insignificant.

In Germany brown shrimp fishing, which involves trawling, takes place from the shoreline down to the 20m depth within the 3 nautical mile zone, and is of great economic importance in Lower Saxony. This means that regulated shrimp fishing is permitted in the proposed extension in Germany despite being zone 1 (highest protection). While management responses to reduce shrimp trawling impact are underway, given various conflicting stakeholder interests, the effect of shrimp fishing in the proposed extension poses a potential threat to the ecological integrity of the property. Negative effects from blue mussel collection are considered to have an even greater impact on the proposed extension. Therefore a cohesive plan for sustainable resource use

in the entire property, with clear indicators to ensure that ecological integrity is not being compromised, is required.

All stakeholders recognize that World Heritage status may increase tourism and recreational pressure, and have developed a draft joint strategy for “Sustainable Tourism in the Wadden Sea World Heritage Destination”, aimed at developing high quality, low impact tourism which considers the ecological requirements of the property. While there is strong will supporting this strategy and a zoning system has been developed to regulate activities, its effective implementation will be challenging. There are also military fighter jet exercises over the area as well as many helicopters flying over to service the off-shore platforms, all of which detract from a World Heritage experience.

Threats to the property caused by coastal flood defense and protection, energy generation, pollution with nutrients, shipping and harbour developments require coordination and cooperation of all stakeholders. Threats stemming from climate change (and an inevitable rise in sea level), alien species and shipping safety require an integrated ecosystem approach and the involvement of national governments as well as enhanced international cooperation. The Trilateral Wadden Sea Cooperation, the EU Regulations governing the Natura 200 Network and the EC Habitats Directive, provide a good framework for such cooperation.

IUCN considers that the integrity, the protection and management of the nominated property meet the requirements of the Operational Guidelines.

## 5. ADDITIONAL COMMENTS

The proposed extension of the property is linked to a human-dominated cultural landscape beyond the boundaries of the proposed extension. The settlement history of this territory shows many cultural adaptations to the natural environment in the region, including the construction of numerous mounds and a sophisticated irrigation and drainage system. Therefore the World Heritage status of this area, if inscribed on the World Heritage List, should be proactively used to promote and present the long history of interactions between man and nature in the Wadden Sea.

## 6. APPLICATION OF CRITERIA

The **Wadden Sea** has been nominated under natural criteria (viii), (ix) and (x) as an extension of the Wadden Sea (Germany/Netherlands).

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

The-proposed extension reaffirms and strengthens the existing justification for inscription under criterion (viii)

which is: *“The Wadden Sea is a depositional coastline of unparalleled scale and diversity. It is distinctive in being almost entirely a tidal flat and barrier system with only minor river influences, and an outstanding example of the large-scale development of an intricate and complex temperate-climate sandy barrier coast under conditions of rising sea-level. Highly dynamic natural processes are uninterrupted across the vast majority of the property, creating a variety of different barrier islands, channels, flats, gullies, saltmarshes and other coastal and sedimentary features.”*

IUCN considers the nominated property meets this criterion.

### **Criterion (ix): Ecosystems/communities and ecological/biological processes**

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

IUCN considers the nominated property meets this criterion.

### **Criterion (x): Biodiversity and threatened species**

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

IUCN considers the nominated property meets this criterion.

A summary of new attributes that would be added to the existing inscribed property through the approval of the extension are summarized in the section on “Comparison with other areas” above.

## 7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC-14/38.COM/8B and WHC-14/38.COM/INF.8B2;

2. Approves the extension of the **Wadden Sea (Denmark, Germany, Netherlands)** on the World Heritage List under natural criteria (viii), (ix) and (x).

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

### **Brief Synthesis**

*The Wadden Sea is the largest unbroken system of intertidal sand and mud flats in the world, with natural processes undisturbed throughout most of the area. The 1,143,403 ha World Heritage property encompasses a multitude of transitional zones between land, the sea and freshwater environment, and is rich in species specially adapted to the demanding environmental conditions. It is considered one of the most important areas for migratory birds in the world, and is connected to a network of other key sites for migratory birds. Its importance is not only in the context of the East Atlantic Flyway but also in the critical role it plays in the conservation of African-Eurasian migratory waterbirds. In the Wadden Sea up to 6.1 million birds can be present at the same time, and an average of 10-12 million pass through it each year.*

### **Criteria**

#### **Criterion (viii)**

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

#### **Criterion (ix)**

*The Wadden Sea includes some of the last remaining natural large-scale intertidal ecosystems where natural processes continue to function largely undisturbed. Its geological and geomorphologic features are closely entwined with biophysical processes and provide an invaluable record of the ongoing dynamic adaptation of*

*coastal environments to global change. There are a multitude of transitional zones between land, sea and freshwater that are the basis for the species richness of the property. The productivity of biomass in the Wadden Sea is one of the highest in the world, most significantly demonstrated in the numbers of fish, shellfish and birds supported by the property. The property is a key site for migratory birds and its ecosystems sustain wildlife populations well beyond its borders.*

#### **Criterion (x)**

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

#### **Integrity**

*The boundaries of the extended property include all of the habitat types, features and processes that exemplify a natural and dynamic Wadden Sea, extending from the Netherlands to Germany to Denmark. This area includes all of the Wadden Sea ecosystems, and is of sufficient size to maintain critical ecological processes and to protect key features and values.*

*The property is subject to a comprehensive protection, management and monitoring regime which is supported by adequate human and financial resources. Human use and influences are well regulated with clear and agreed targets. Activities that are incompatible with its conservation have either been banned, or are heavily regulated and monitored to ensure they do not impact adversely on the property. As the property is surrounded by a significant population and contains human uses, the continued priority for the protection and conservation of the Wadden Sea is an important feature of the planning and regulation of use, including within land/water-use plans, the provision and regulation of coastal defences, maritime traffic and drainage. Key threats requiring ongoing attention include fisheries activities, developing and maintaining harbours, industrial facilities surrounding the property including oil and gas rigs and wind farms, maritime traffic, residential and tourism development and impacts from climate change.*

#### **Requirements for Protection and Management**

*Maintaining the hydrological and ecological processes of the contiguous tidal flat system of the Wadden Sea is an overarching requirement for the protection and integrity*

*of this property. Therefore conservation of marine, coastal and freshwater ecosystems through the effective management of protected areas, including marine no-take zones, is essential. The effective management of the property also needs to ensure an ecosystem approach that integrates the management of the existing protected areas with other key activities occurring in the property, including fisheries, shipping and tourism.*

*The Trilateral Wadden Sea Cooperation provides the overall framework and structure for integrated conservation and management of the property as a whole and coordination between all three States Parties. Comprehensive protection measures are in place within each State. Specific expectations for the long-term conservation and management of this property include maintaining and enhancing the level of financial and human resources required for the effective management of the property. Research, monitoring and assessment of the protected areas that make up the property also require adequate resources to be provided. Maintenance of consultation and participatory approaches in planning and management of the property is needed to reinforce the support and commitment from local communities and NGOs to the conservation and management of the property. The State Parties should also maintain their commitment of not allowing oil and gas exploration and exploitation within the boundaries of the property. Any development projects, such as planned wind farms in the North Sea, should be subject of rigorous Environmental Impacts Assessments to avoid any impacts to the values and integrity of the property.*

4. Commends the State Parties of Germany, Netherlands and Denmark for their joint efforts in extending this property.

5. Requests the State Party of Denmark, in cooperation with the State Parties of the Netherlands and Germany, to prepare an implementation plan to enhance the conservation and management of the attributes of Outstanding Universal Value within the Danish National Park. This could be supported by the development and adoption of a binding agreement between the Danish Nature Agency and the National Park Board.

6. Requests the State Parties of Denmark, Germany and the Netherlands to develop a single integrated management plan for the entire transboundary property in conformity with the requirements of Paragraph 111 of the Operational Guidelines, and to consider the options to strengthen the effectiveness of implementation of coordinated management within the property.

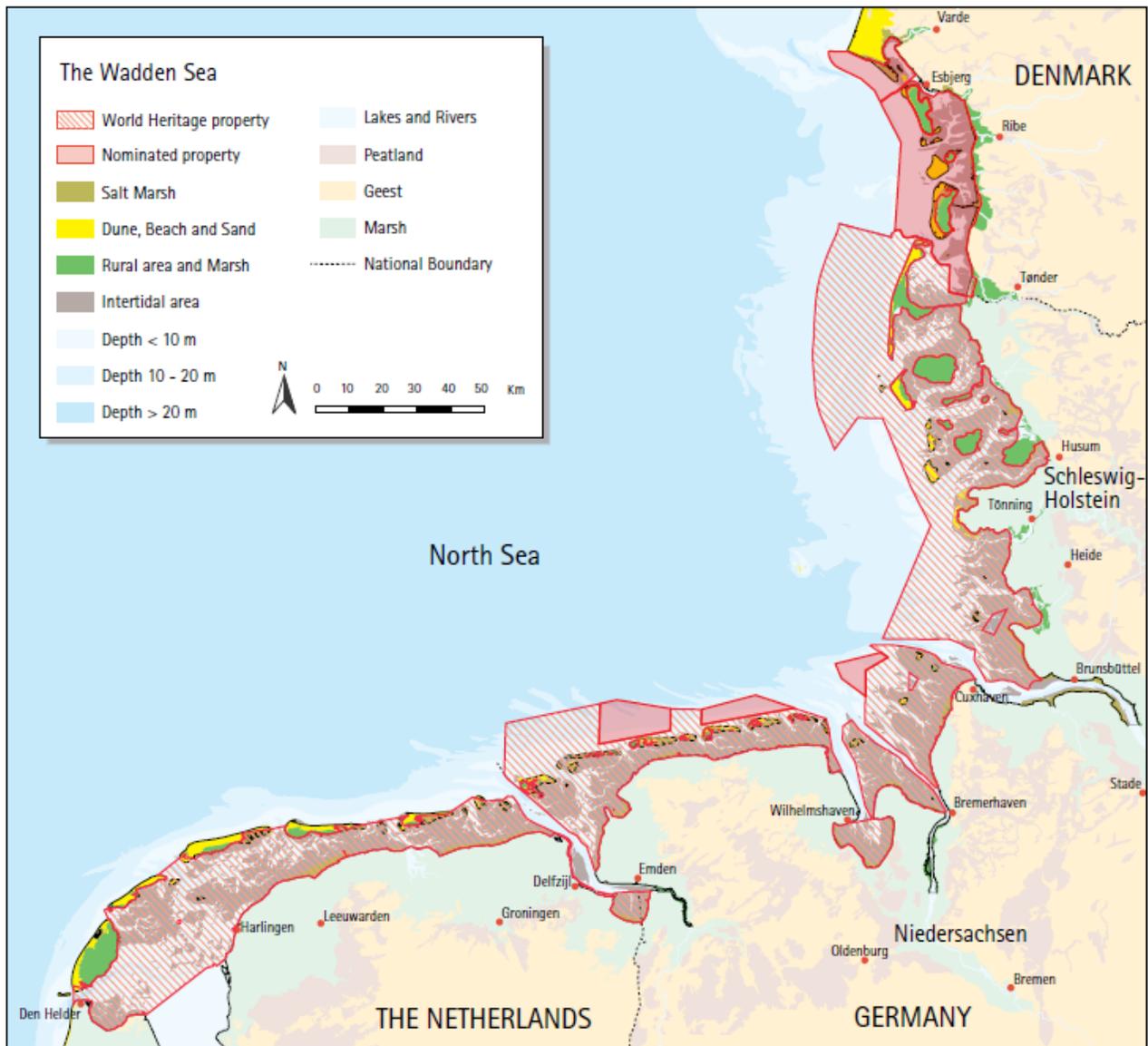
7. Recommends the States Parties to extend further the monitoring of impacts of fisheries activities within the existing and extended property, and consider the opportunities to ensure protection of the property from any detrimental impacts.

8. Further requests the State Parties of Denmark, Germany and the Netherlands to submit, by **1 February 2016**, a joint report, including a 1-page executive summary, on the state of conservation of the property, including confirmation of progress on the development and adoption of the integrated management plan and the institutional and financial provisions that will be in place to ensure its effective implementation.

**Map 1:** Proposed extension location



**Map 2:** Proposed extension



**EUROPE / NORTH AMERICA**

**STEVNS KLINT**

**DENMARK**





# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## STEVNS KLINT (DENMARK) – ID No. 1416

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** To inscribe the property under natural criteria.

**Key paragraphs of Operational Guidelines:**

Paragraph 77: Nominated property meets World Heritage criteria.

Paragraph 78: Nominated property meets integrity and protection and management requirements.

### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 20 March 2013

**b) Additional information officially requested from and provided by the State Party:** Following the technical evaluation mission the State Party was requested to provide supplementary information on 13 December 2013. The information was received on 28 February 2014.

**c) Additional literature consulted:** Various sources as cited in the nomination, together with Wells, R. T. (1996) **Earth's geological history: a contextual framework for assessment of World Heritage fossil site nominations.** IUCN, Gland; Molina, E., Alegret, L., Arenillas, I., Arz, J.A., Gallala, N., Hardenbol, J., von Salis, K., Etienne Steurbaut, Noel Vandenberghe, E. and Zaghib-Turki, D. (2006) **The Global Boundary Stratotype Section and Point for the base of the Danian Stage (Paleocene, Paleogene, "Tertiary", Cenozoic) at El Kef, Tunisia - Original definition and revision.** Episodes, Vol. 29, no. 4. IUGS.; Dingwall, P., Weighell, T. and Badman, T. (2005). **Geological World Heritage: A Global Framework.** IUCN, Gland.

**d) Consultations:** 10 desk reviews received. The mission also met with representatives from the Danish Agency for Culture, from Stevns Municipality, from the Ostsjaellands Museum, from the Danish Society for Nature Conservation, from the Stevns Tourist Association, from Landowners and Village associations, from the Danish Ornithological Society, from the University of Copenhagen, with geologists, and other experts.

**e) Field Visit:** Andrej Sovinc and Marie-Luise Frey, 18-20 September 2013

**f) Date of IUCN approval of this report:** March 2014

### 2. SUMMARY OF NATURAL VALUES

The nominated property, Stevns Klint, is a c.40 ha geological site that includes a 15 km long coastline with fossil bearing cliffs as high as 41 m. This rugged coastal

protected area is in eastern Denmark. The nominated property includes intertidal cliffs and adjacent constructed tunnels and abandoned quarries which expose Cretaceous and Tertiary strata. A buffer zone of 4,136 ha has been defined and provides protection for 471 ha of land adjacent to the cliffs and for 3,655 ha of marine areas. The property is technically a serial property of two component parts, as there is a break in the coastal section where a quarry export quay is located at Stevns Kridtbrud.

Stevns Klint illustrates the best-known global mass extinction event in the history of Earth, which marks the Cretaceous - Tertiary (K/T) boundary. This mass extinction occurred c.65 million years ago and is particularly notable due to its association with Chixulub asteroid impact that took place in what is currently the Gulf of Mexico.

This event is marked in the stratigraphic record by a signature reddish layer with a high concentration of the element Iridium, which is associated with the asteroid impact. A boundary clay layer follows representing a period of low biological productivity, and is typically up to 10 cm thick, but at a single locality in the northern part of the cliff, it reaches up to about 30 cm. At this boundary it is estimated that more than half of all living Cretaceous species became extinct including land-living dinosaurs and large marine reptiles.

This exceptional boundary layer is easily recognizable, even to an inexperienced eye. The boundary is clearly visible and lies beneath a pronounced topographic overhang, and separates the underlying soft Cretaceous chalk from the overlying, harder Tertiary limestone. The position of the boundary varies from c. 5m below the present-day sea level in the southern part of the nominated property to c.35m above sea level in the northern part.

The Upper Cretaceous chalk deposits are generally rich in macrofossils, representing a highly diverse marine bottom-dwelling fauna. More than 450 species of macrofossils and hundreds of nanno- and microfossils have been found in the exposed chalk at Stevns Klint. The lowest part of the Tertiary Period is represented by large bryozoan limestone mounds with thick black flint.

Stevns Klint is also a classic study locality, with a special place in the theory of the asteroid-induced cause of the K/T extinction. The nominated property was one of three locales studied by a group of scientists, led by W. Alvarez, which informed the theory that the Earth had received a large amount of extra-terrestrial materials at the Cretaceous – Tertiary boundary, the basis of the idea that the Earth has been subject to an asteroid impact that led to the mass extinction.

In addition to its geological values, for which it is nominated, the nominated property also includes other notable natural values. It lies on an important bird migration route between Scandinavia and southern Europe and Africa. Species of particular conservation concern at the European level include the Sand Lizard, seven bat species, Smooth and Great Crested Newt. Two abandoned quarries are part of the European Natura 2000 network as habitats for amphibian species. At the national level, 22 butterfly species and a nationally rare spider species are found in the area. The marine area is also part of the Natura 2000 network.

The nominated property also has locally and nationally significant cultural associations, including in relation to past military history, and the production of building stone.

### 3. COMPARISONS WITH OTHER AREAS

The nomination has been made exclusively under natural criterion (viii), and contains a significant comparative analysis, which is relevant to three of the thirteen themes in IUCN's 2005 framework for geological World Heritage: stratigraphy, the record of life and meteorite impact.

The K/T boundary is a global phenomenon, created by an event very distant from Stevns Klint. There are many sites that contain this exposure. The nomination undertakes a comparison with 500 registered localities globally, and then a short list of these sites, to demonstrate its superlative quality in documenting the K/T boundary. This finding is partly supported by its short-listing as a Global Boundary Stratotype Section and Point (GSSP), although it was not finally selected for this status. The nomination emphasizes additional values that are relevant to World Heritage Listing in relation to the current GSSP (El Kef, Tunisia), including its ready accessibility and visibility. Details are provided in the nomination documentation, including a listing of the comparator sites. IUCN agrees that GSSP status on its own is not a good predictor of Outstanding Universal Value, and considers that the analysis of the State Party is sound in this regard.

In addition to providing a high quality exposure of the K/T boundary, the nominated property also is directly associated with the work that led to the recognition of this phenomenon, and the theory of asteroid driven

extinction. It includes one historic iridium anomaly sampling points of the Alvarez group, below Hojerup Church, and is the most accessible of the three research sites that this group worked in.

There is also a significant fossil record before and after the K/T boundary layer. The faunal assemblage includes a diverse macro invertebrate fauna which expands the understanding of invertebrate recovery and evolution after the mass extinction event. IUCN did not consider that the comparative analysis had adequately considered the record of life, and the State Party responded to a request to complete the fossil site checklist that has been used by IUCN since 1996 to frame consistent advice to the World Heritage Committee. IUCN has considered this further information in an annex to the evaluation report, and considers that it greatly supports the case for the application of criterion (viii).

In relation to meteorite impact, IUCN notes the previous inscription of the major impact site of the Vredefort Dome, South Africa, which is the largest recorded energy release event on Earth. This site records an event that is larger than the Chixulub event, and is much older and not associated with a mass extinction event. IUCN considers that the Chixulub event can be regarded as equally iconic to the event that resulted in the Vredefort Dome, considering the former's dramatic association with the phenomenon of mass extinction, notably of the best-known group of animals in the fossil record, the dinosaurs.

Thus, on the basis of the unique combined association of the stratigraphic quality of the geological record at Stevns Klint, its direct association with major scientific discovery, and its demonstration of an exceptional and dramatic meteorite impact and the associated ecosystem response, evidenced in the fossil record, IUCN considers that the nominated property makes a strong case for the application of criterion (viii). In reaching this judgment, the IUCN World Heritage Panel considered that, should the Committee agree to include Stevns Klint on the World Heritage List, this would be sufficient to recognize the K/T mass extinction and thus should not be regarded as the basis for serial extensions. IUCN thus considers it would complete an adequate representation on the World Heritage List of the phenomenon of meteorite impact.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

The nominated property and its buffer zone are protected through a variety of European, national and local mechanisms. These include that Stevns Klint has been designated an Area of National Geological Interest by the Danish Conservation Agency at the Ministry of Environment.

The property, together with its landward buffer zone, as located within the 300 m coastal belt, is subject to the Danish Act on the Protection of Nature and Act on Coastal Protection. In summary this protection regime prohibits changes to the condition of beaches or other coastal areas, alteration of the terrain, removal of raw materials by digging or adding soil, plants, trees or bushes, but allows traffic on foot, brief occupancy and swimming at the individual's own risk. There are national and municipal regulations that provide adequate protection for the property.

In general, there are two forms of ownership in the nominated property: public (governmental and municipal) and private (associations, companies and individuals). The cliff is primarily private property with the local estate Gjorslev Gods as the largest owner (95 % of the cliff is owned by this private landowner). The State and Stevns Municipality each own 1% of the cliff and the rest (3%) is owned by other private landowners. The State also owns the abandoned quarry Holtug Kridtbrud, while Stevns Municipality owns the abandoned quarry Boesdal Kalkbrud and passages of the Cold War Fortress Stevnsfort. The marine buffer zone is also State owned. Whilst traditional rights for quarrying theoretically exist inside the property boundaries, the State Party has confirmed in writing that these will not be exploited. The wider legislative protection ensures that these privately owned areas have statutory, secure long term protection in relation to the key features of the property. In addition, the IUCN evaluation mission in September 2013 was able to meet the major landowners, who confirmed their support for the nomination and the protection of the site.

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

## 4.2 Boundaries

The boundaries of the main coastal sections of the nominated property are defined by topographic features visible in the landscape, notably the top of the eroding cliff line. The boundaries of the disused quarries and the tunnel areas are clearly defined in relation to those features. Whilst these exposures are the result of human activities, they add relevant educational and research opportunities to the possible listing, and so make practical sense.

These different boundaries encompass the main features of geological interest. Due to continuous erosion from the sea, the profile of the cliff is constantly changing and kept fresh and well exposed. The new naturally occurring exposures have potential to yield additional fossils which in turn will enhance opportunities for future research at the site. The boundary of the nominated property accommodates the natural processes of coastal erosion, and as the cliff face migrates landwards, so does the nominated property boundaries. This approach to boundary setting

corresponds to accepted good practice, already recognized in the existing World Heritage listings of the Dorset and East Devon Coast (United Kingdom) and Joggins Fossil Cliffs (Canada).

A buffer zone is outlined following the boundaries of existing areas of legal protection; landwards the buffer zone follows a national 300m coastal protection zone. The maritime buffer zone follows the boundaries of the Natura 2000 area of Stevns Klint. It covers the entire stretch from Rodvig to Bogeskov between the coastline and approximately 2 km out into the Baltic Sea, with two minor exclusions that correspond to long-standing small-scale infrastructure. The buffer zone provides both adequate landward scope to allow the natural evolution of the coastline, and adequate seaward extent to maintain natural coastal processes, and to engage in the regulation of any offshore activities that could, theoretically at least, be proposed.

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

## 4.3 Management

The Heritage Agency of Denmark, Stevns Municipality and Ostsjaellands Museum representatives form the basis of the Steering Group that is responsible for the nomination. They have the responsibility for setting out general guidelines to ensure protection, conservation and presentation of the property, ensure involvement of stakeholders in the process of preparation of the Management Plan and secure funding for implementation of the Plan. The Management Plan dates from 2011.

The implementation of the Management Plan takes place in collaboration between a number of stakeholder groups, including Stevns Municipality and Ostsjaellands Museum, with collaboration of the Heritage Agency of Denmark, The Danish Nature Agency, Selskabet Hojeruplund Society, Foreningen Boesdal, Stevns Tourist Association and the Danish Society for Nature Conservation, as well as the landowners.

IUCN sought further information on the future plans for ensuring good and effective management, and the State Party has provided full details of a new organisation structure noted within the Stevns Klint Management Plan 2011, which would be implemented by autumn 2014, if the property is inscribed on the World Heritage List. This provides for a board, secretariat, a geological and local reference groups, and other working groups. Maintaining and supporting the high degree of local community involvement is central to the organisation.

The Stevns Klint Management Plan has been drawn up with high degree of inclusion of local residents, interested organizations, experts, and other stakeholders. It provides a vision, objectives and targets for the protection, presentation, and sustainable use,

including but not limited to the geological values. The plan includes objectives in relation to conservation, education, science, as well as local engagement and sustainable tourism.

Together with the legislative provisions, the Management Plan sets out an effective framework for protection of the nominated property, its buffer zone and wider landscape. Stevns Municipality has decided to contribute 3 million Danish kroner annually for five years as a supplement to the current handling of tasks of securing the values and creating a complete experience for visitors. It is also expected that considerable external financing will be procured via fundraising conducted by the operative unit. The money is earmarked for the tasks that are to be carried out pursuant to the Management Plan and for salaries of the operative unit.

Provided that the intended management structure is implemented in a timely fashion, as per the State Party's undertakings, IUCN considers that the nominated property meets the management requirements of the Operational Guidelines.

#### 4.4 Community

There has been strong community engagement in the preparation of the nomination. During the evaluation mission, meetings were held with over 40 representatives of local communities and stakeholders; there was an exceptionally high level of knowledge and information about the World Heritage Convention. No signs of disagreement with the nomination of the property were detected. On the contrary, representatives of the local community presented a statement of agreement with the nomination. Landowners are well informed about the nomination, and supportive of it.

#### 4.5 Threats

Past historical use of the property has had some impacts, but these are minor in relation to the geological values that are represented.

In terms of current threats, the site is substantially a naturally eroding coastline. It is forbidden to establish breakwaters which would limit wave erosion. The cliff will therefore remain under the influence of natural erosion. The only exceptions are areas in front of the historical monument in Hojerup – Middle Age church – and in front of the recreational area of the abandoned quarry Boesdal Kalkbrud, where long-standing structures maintain historical and recreational values of those areas. The risk of rockfall along the cliff should be considered as part of the natural processes that are essentially linked to every cliff area, and it will be important to continue to manage risks to visitors. The artificial exposures in quarries and tunnels will require some maintenance to keep them as safe and accessible parts of the site, and manage any overgrowth of key sections.

Impacts of the climate change will result in increasing frequency of storm events and sea-water levels. Even with increasing sea-levels as predicted for the next hundred years, the boundary of the nominated property will still be mainly above sea-level and accessibility will not be limited; however, the tunnels of the Cold War fortress may be affected from rising sea-levels. The management plan for the area includes securing the present entrance openings to the fortress from the sea by sealing them. Increased erosion rates due to the impacts of more frequent storm events is not considered a problem for the cliff itself due to width of the buffer area behind the cliff.

The nominated property, comprising the cliff with beach and part of sea-bed, abandoned quarries and tunnels of the Cold War fortress, is an area which is largely inappropriate for development due to physical constraints, topography, limited access and legislation. There is a path on parts of the upper edge of the cliff, and visitors walk on the beach. Traces of some camp fires at some places indicate the presence of mostly local fishermen, but this can not be considered as significant negative impact. The same can be said for vandalism where there is currently limited impact.

No major developments, such as extensive golf courses or wind farms, which would have negative effect on the nominated property, are allowed in the landward buffer zone according to the legislation. In the Management Plan for the area, approved by the Stevns Community, a pesticide and fertilizer-free zone of 20 m is to be established along the upper edge of Stevns Klint and, in the long term, a cultivation-free zone is to be established along the same edge of the cliff. More and larger pasture areas are to be established.

The 300m wide landward buffer zone is complemented by wider restrictions in an area extending up to 3 km landwards. This includes Boesdal Kalkbrud (abandoned limestone quarry), Cold War Museum Stevnsfort, Hojerup (historical village and today the primary entrance to Stevns Klint), Stevns Lighthouse (Stevns Fry), Mandehoved/Flagbanken (viewing and presentation area), Bogeskov and Holtug Kridtbrud (access for visitors to the nominated area with visitor's facilities, including car park). Restrictions and limitations on development are in place to maintain the character of these areas through the Management Plan, and local planning laws.

The maritime buffer zone, included in the Natura 2000 area, allows only for some small fisheries. According to the national spatial and planning schemes, no wind farms are planned for development in seaward from the nominated property.

The nominated property is interrupted with a small gap at Stevns Kridtbrud, where an active quarry exists, with a quay for seaborne export within the marine buffer zone. Extraction is permitted until 2033. The State Party notes that extraction can only take place within a clearly

specified area and there is a clear policy that no further permissions will be given for the extraction of chalk east of the Hærvejen road. As a consequence of this ruling, the extraction area cannot be extended beyond the presently specified limits and extensions outside the property could only take place at a greater distance than at present from the property. Shipping associated with the export is very limited and well regulated, but requires continued supervision and appropriate contingency plans. Continued thorough supervision of the quarry is also required to ensure its impacts on its immediate surroundings do not increase. The areas already exploited are currently the subject of rehabilitation measures. This is the only industrial site close to the nominated property, and in the very long term would be capable of restoration.

As already noted above, the State Party has confirmed that there are no extractive activities, and none will be permitted within the boundary of the nominated property. This is an essential requirement given the clear position of the World Heritage Committee that extractive industry is incompatible with World Heritage Listing.

IUCN also raised questions with the State Party regarding the approach to fossil collecting. The nomination indicates that the current visitation to the nominated property was high and that there were projections for increased visitation. Current and projected visitation has the potential to negatively impact the fossil heritage at the proposed site due to uncontrolled/poorly managed fossil collecting. Supplementary information received from the State Party indicates that significant progress has been made to address this threat. It describes the legislative framework for protection of natural heritage in Denmark, and regional and municipal planning to support the protection of the nominated property. Furthermore, guidelines that regulate collecting and also zoning the property for managing visitation along the coast have been developed. It will be essential that these protection strategies are fully implemented with appropriate resources provided.

IUCN considers that the nominated property meets the integrity, protection and management requirements of the Operational Guidelines.

## 5. ADDITIONAL COMMENTS

### 5.1 Serial property

When IUCN evaluates a serial World Heritage Property it asks the following questions:

#### a) What is the justification for a serial approach?

The serial approach has been taken in order to ensure exclusion of a long-standing area of continuing extractive industry from the property, at Stevns Kridtbrud. This is justifiable as such an area could not be included in the property boundary due to the position of the World

Heritage Committee, and IUCN, that extractive industry is not compatible with World Heritage status.

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

The two components are functionally linked as two elements of the geological exposures of Stevns Klint. The gap between the components is very small.

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

The two components are addressed by the same management framework.

## 6. APPLICATION OF CRITERIA

**Stevns Klint** has been nominated under natural criterion (viii).

### Criterion (viii): Earth History and Geological Processes

Stevns Klint is a globally exceptional testimony to the impact of meteorite impact on the history of life on Earth. The property provides a representation of the evidence of the Chixulub meteorite impact that took place at the end of the Cretaceous Period, c.65 million years ago. This impact is widely believed by modern scientists to have caused the end of the Age of the Dinosaurs, and led to the extinction of more than 50% of life on Earth. This is the most recent of the major mass extinctions in Earth's history. Comparative analysis indicates this is the most significant and readily accessible site, of hundreds available, to see the sedimentary record of the ash cloud formed by the meteorite impact, the actual site of the impact being deep underwater offshore the Yucatan peninsula. In addition, the site has iconic scientific importance as the most significant and accessible of the three localities where the radical theory for asteroid driven extinction was developed through the seminal work of Walter and Luis W Alvarez, with their co-workers. Stevns Klint is highly significant in terms of its past, present and future contribution to science, especially pertaining to the definition of and explanation of the Cretaceous/Tertiary (K/T) boundary.

The outstanding fossil record at Stevns Klint provides a succession of three biotic assemblages including the most diverse end-Cretaceous marine ecosystem known. The million years recorded in the rock at Stevns Klint provides evidence of a climax pre-impact community, fauna that survived a mass extinction event, and the subsequent faunal recovery and increased biodiversity following this event. The fossil record shows which taxa became extinct and which survived and reveals the tempo and mode of evolution of the succeeding post impact fauna that diversified to the marine fauna of today, thus providing important context for the main K/T boundary layer exposed at Stevns Klint.

IUCN considers the nominated property meets this criterion.

## 7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC-14/38.COM/8B and WHC-14/38.COM/INF.8B2;

2. Inscribes **Stevns Klint (Denmark)** on the World Heritage List under criterion (viii).

3. Adopts the following Statement of Outstanding Universal Value:

### **Brief Summary**

*Stevns Klint is a globally exceptional testimony to the impact of meteorite impact on the history of life on Earth. The property provides evidence of the Chixulub meteorite impact that took place at the end of the Cretaceous Period, c.67 million years ago, and is widely believed to have caused the end of the Age of the Dinosaurs. The property has further iconic scientific importance due to its association with the radical theory for asteroid driven extinction developed through the seminal work of Walter and Luis W Alvarez, with their co-workers. Stevns Klint is highly significant in terms of its past, present and future contribution to science, and makes these values accessible to the wider global community as a whole.*

### **Criteria**

#### **Criterion (viii)**

*Stevns Klint is a globally exceptional testimony to the impact of meteorite impact on the history of life on Earth. The property provides a globally exceptional representation of the evidence of the Chixulub meteorite impact that took place at the end of the Cretaceous Period, c.67 million years ago. This impact is widely believed by modern scientists to have caused the end of the Age of the Dinosaurs, and led to the extinction of more than 50% of life on Earth. This is the most recent of the major mass extinctions in Earth's history. Comparative analysis indicates this is the most significant and readily accessible site, of hundreds available, to see the sedimentary record of the ash cloud formed by the meteorite impact, the actual site of the impact being deep underwater offshore the Yucatan peninsula. In addition, the site has iconic scientific importance as the most significant and accessible of the three localities where the radical theory for asteroid driven extinction was developed through the seminal work of Walter and Luis W Alvarez, with their co-workers. Stevns Klint is highly significant in terms of its past, present and future contribution to science especially pertaining to the definition of and explanation of the Cretaceous/Tertiary (K/T) boundary.*

*The outstanding fossil record at Stevns Klint provides a succession of three biotic assemblages including the most diverse end-Cretaceous marine ecosystem known. The million years recorded in the rock at Stevns Klint provides evidence of a climax pre-impact community, fauna that survived a mass extinction event, and the subsequent faunal recovery and increased biodiversity following this event. The fossil record shows which taxa became extinct and which survived and reveals the tempo and mode of evolution of the succeeding post impact fauna that diversified to the marine fauna of today, thus providing important context for the main K/T boundary layer exposed at Stevns Klint.*

### **Integrity**

*The property contains the coastal rock exposures that are of Outstanding Universal Value. There is a small break in the site where an active quarry is located, in the buffer zone, resulting in the site being a serial property. Boundaries along the cliff address and accommodate the natural erosion processes of the sea, and include the beach area where eroded blocks fall as natural erosion progresses. The landward and seaward buffer areas are adequate.*

*Existing human made exposures landward of the cliff also support the integrity of the site. These exposures are in areas that include two abandoned quarries and tunnels that had historically been used for military purposes. The inclusion of these areas enhances opportunities for visitor services and interpretation and supports further understanding related to the three dimensions of the paleo-seascape. These anthropogenic features, based on calculated rates of sea level rise and planned coastal management strategies, are durable as accessible exposures for hundreds of years.*

### **Protection and Management Requirements**

*The property benefits from overlapping national and local legislation, and has an up to date management plan supported through local government planning strategies. The property is protected from development and will continue to evolve as a natural and unprotected stretch of coastline.*

*A specific organizational structure for management of the property has been designed to support management needed following inscription on the World Heritage list. The site is governed and managed through a steering group with representation from state, regional governments, and landowners including private (majority of the nominated property is privately owned) and public. The steering group is complemented by a local organization with a board of directors, a secretariat supported by a Director and Site Manager, and two standing committees (a local reference group and a scientific reference group).*

*There is strong community support for the nomination, and a co-management approach with a range of partners including local government, the local museum, NGOs and private sector interests. Sustained and*

*adequate finance for the management of the property is a long-term requirement. Project funding has been secured with a plan for securing sustainable funding based on a five-year management cycle. Ongoing management funding will be provided through the local government. Both national level and private sector involvement in the management of the site will also provide support to the property.*

*There are some threats to the property that require continued attention. There is notable visitation, and projections that this will increase. This has the potential to negatively impact the fossil heritage through uncontrolled/poorly managed fossil collecting. This threat is managed through the legislative framework for protection of natural heritage in Denmark and regional and municipal planning to support the protection of the nominated property. Guidelines are in place that regulate collecting and also zoning the property for managing visitation along the coast. It will be of additional importance that tourism and visitation is part of a local strategy for sustainable tourism, and that effective education, interpretation and curation facilities are provided.*

*The property is protected from extractive use, in line with the principle that such uses are incompatible with World Heritage Site status, and the State Party has provided a series of examples of cases where government has denied requests for extraction of resources to ensure the protection of natural heritage values. A dormant claim for quarrying adjoining the property expires in 2028 and will not be renewed, nor activated prior to its expiry.*

4. Recommends the State Party, in managing the property following inscription, to:

- a) establish without delay the revised and specific management system proposed to assume responsibility for the property upon inscription on the World Heritage List;
- b) retain policies to ensure that no mining and/or quarrying activities take place within the property, nor any adjacent extraction activities that could impact the property;
- c) ensure effective implementation of fossil collecting guidelines, including appropriate curation of key specimens;
- d) ensure effective engagement of the private landowners in the protection and management of the property on an ongoing basis;
- e) ensure effective presentation of the property, to provide for a high quality visitor experience, supported by appropriate education and interpretation facilities;
- f) continue strong processes of local community engagement in the property, and the commendable shared management approach with local communities and stakeholders.

5. Considers that this nomination can be regarded as completing the recognition of the phenomenon of asteroid impact, and its impact on the history of life on Earth, on the World Heritage List.

## Annex 1: IUCN Fossil Site Evaluation Checklist

Attention is also drawn to the supplementary information of the State Party that provides greater elaboration of a number of the points below.

### 1. Does the site provide fossils which cover an extended period of geological time: i.e. how wide is the geological window?

The fossil record is of high species diversity across the Cretaceous–Paleogene (K/T) boundary. The marine fossil fauna and the prominent presence of the impact layer makes Stevns Klint the best locality worldwide to show the global effect of the impact by a meteorite and the associated mass extinction. The fossil-rich succession covers the story of the mass extinction that brought an end to the dinosaurs and the large marine reptiles, and of the succeeding recovery of the marine biota. The geological window as a whole is around 1 million years, including the record of the instantaneous event of the meteorite impact, and the stratigraphic context before and after that event.

### 2. Does the site provide specimens of a limited number of species or whole biotic assemblages?

The nominated property includes a succession of three biotic assemblages starting with a high-diversity end-Cretaceous climax community, followed by post-impact disaster fauna, which is rapidly followed by a rich recovery fauna. These make Stevns Klint an outstanding locality to show the effect of a severe mass extinction on a climax ecosystem, including the mode and tempo of the subsequent recovery.

### 3. How unique is the site 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?

Stevns Klint is unique in presenting a highly diverse biota and a complete boundary section topping the most expanded end-Cretaceous section available. Stevns Klint is an obvious candidate as a stratigraphic boundary type locality, and was one of the primary candidates for this recognition. However the main stratigraphic type locality at El Kef was chosen for this role. That locality is rich in microfossils but compared to Stevns Klint it is very poor in macrofauna, including the large vertebrates. The State Party notes that El Kef fully qualifies as the stratigraphic type locality for the K/T boundary, but considers Stevns Klint undoubtedly is unrivalled for the study of faunal evolution across a mass extinction event. In addition the State Party considers that studies are now available that strengthens the case for Stevns Klint to be regarded as the global type section.

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

There are many sites globally that exhibit the K/T boundary; however the comparative analysis within the nomination, and the further consideration by IUCN

confirm that Stevns Klint presents the strongest case for recognition of a site as being of Outstanding Universal Value. The outstanding boundary succession at Stevns Klint not only shows the impact layer but contains the richest marine fauna known from the boundary strata at both low and high taxonomic levels. The association with the Alvarez group seminal work is also compelling.

If a serial nomination should be considered then the impact crater at Yucatán would be a candidate, if it were not for the fact that it is deeply buried and only known from boreholes and geophysical data. Thus such an idea is impractical. Conversely, IUCN considers that a serial nomination with other exposures would not be appropriate, and that the nominated property conveys the Outstanding Universal Value of the record of the K/T boundary for the purposes of the World Heritage Convention.

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

Mass extinction has been studied at numerous locations worldwide, but Stevns Klint stands out for the study of the K/T event. The discovery of an iridium anomaly in Stevns Klint by Walter Alvarez in 1978 led to the hypothesis of an extraterrestrial impact causing the mass extinction. The seminal paper of Alvarez published in *Science* in 1980 led to increased scientific interest reflected in more than 180 papers that have since followed based on studies of Stevns Klint material.

### 6. What are the prospects for ongoing discoveries at the site?

Considerable prospects, as evidenced by continuing publication of papers in high-profile journals.

### 7. How international is the level of interest in the site?

Stevns Klint is of the highest international interest. Almost all K/T boundary scientists will have visited Stevns Klint and the site has been studied by many international teams, resulting in more than 50 scientific papers per decade since the 1980s.

### 8. Are there other features of natural value (e.g. scenery, landform, and vegetation) associated with the site?

The site is primarily a scenic substantially natural coastline, of national importance, with one intrusive development in its centre at Stevns Kridtbrud. It is also part of notable nature conservation areas, such as its status as an Important Bird Area, in relation to migratory birds.

### 9. What is the state of preservation of specimens yielded from the site?

Well preserved calcite fossils, microfossils, and casts of aragonite fossils, and very high quality preservation of teeth of sharks, ray-finned fish, and mosasaurs.

**10. Do the fossils yielded provide an understanding of the conservation status of contemporary taxa and/or communities?**

The mass extinction at the K/T boundary was the last of the 'Big Five' mass extinctions, and the survivors of this event form the basis for the evolution of modern life on Earth. The site also is a testimony to the potential catastrophic impact of meteorite impact on life, and to the study of how life recovers from such major global cataclysms.

**Map 1:** Nominated property location



**Map 2:** Nominated property and buffer zone



**EUROPE / NORTH AMERICA**

# **TECTONO-VOLCANIC ENSEMBLE OF THE CHAINE DES PUYs AND LIMAGNE FAULT**

**FRANCE**





## WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

### TECTONO-VOLCANIC ENSEMBLE OF THE CHAÎNE DES PUYs AND LIMAGNE FAULT (FRANCE) – ID 1434

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** Not to inscribe the property under natural criteria.

#### Key paragraphs of Operational Guidelines:

Paragraph 77: Nominated property does not meet relevant World Heritage criteria.

Paragraph 78: Nominated property does not meet integrity or protection and management requirements.

**Background note:** The Committee's past deliberations in relation to volcanic nominations should be recalled, notably decisions 31 COM 8B.12 (2007, Christchurch) and 37 COM 8B.15 (2013, Phnom Penh), which stated, and then reiterated, that “there is increasingly limited potential for further inscriptions of volcanic sites on the World Heritage List”. At its 37<sup>th</sup> Session the Committee also requested “IUCN to revisit and update its thematic study on “World Heritage Volcanoes”, with input from reviewers expert in volcanic sites, to clearly articulate a short and appropriately balanced list of the strongest remaining candidate volcanic sites with potential for inscription on the World Heritage List.

## 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 20 March 2013

**b) Additional information officially requested from and provided by the State Party:** None requested

**c) Additional literature consulted:** A wide range of references, including: Boivin P., Thouret, J.C., 2014. **The volcanic Chaîne des Puys: a unique collection of simple and compound monogenetic edifices.** «Geomorphological Landscapes of France ». Springer. (in Landscapes and landforms in France, eds F Fort and M.F. André). Grosse P, van Wyk de Vries B, Euillades P, Kervyn M, Petrinovic IA (2011) **Systematic morphometric characterization of volcanic edifices using digital elevation models;** *Geomorphology* 136: 114-131. Hamelin Cédric, S.H.-M., Barrat Jean-Alix , Dosso Laure, and Maury René C. , C., 2009. **A lower crustal component: Evidence from an alkaline intraplate volcanic series (Chaîne des Puys, French Massif Central).** *Chemical Geology*, 266 (2009) 205–217: 205–217. Loock S, Diot H, van Wyk de Vries B, Launeau P, Merle O, Vadeboin F, Petronis MS, **Lava flow internal structure found from AMS and textural data: An example in methodology from the Chaîne des Puys, France.** *Journal of Volcanology and Geothermal Research*, 177, 4: 1092-1104. Loock S, van Wyk de Vries B, Henot J-M (2010) **Clinker formation in basaltic and trachybasaltic lava flows Bulletin of Volcanology** (on Line) DOI: 10.1007/s00445-010-0362-y. 72: 859-870. Martel, C. et al., 2013. **Trachyte phase relations and implication for magma storage conditions in the Chaîne des Puys (french Massif central).** *Journal of Petrology*, v. 54, no. 6, 1071-1107. doi:10.1093/petrology/egt006. Miallier D., Boivin P., Deniel C., Gourgaud A., Lanos P., Sforza M. et Pilleyre T., (2010) **The ultimate summit eruption of Puy de**

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**d) Consultations:** 11 desk reviews received. The mission also met with representatives from the local Project team of the Conseil Général du Puy-de-Dôme; field specialists; volcanologists; professors; mayors; quarry managers; the President of the Conseil Général of the Puy-de-Dôme; the president of the Auvergne Volcanoes Natural Park (PNRVA); and many other stakeholders.

**e) Field Visit:** Josephine Langley and Thomas J. Casadevall, 15-21 September 2013

**f) Date of IUCN approval of this report:** March 2014

## 2. SUMMARY OF NATURAL VALUES

The Chaîne des Puys and Faille de Limagne nominated property, covering 24,250 hectares, is located in the Massif Central region of France. The boundaries for the nominated property were drawn up to include all the geological features and landscapes which characterise this region, including:

- the Limagne fault, a north-south trending geological structure which is composed of several successive segments, separating the Plateau des Dômes to the west (which constitutes the basement of the Chaîne des Puys) from the adjacent plain to the east;
- the c.80 monogenetic volcanoes which form the north-south alignment of the Chaîne des Puys, which is an extinct volcanic field with the last eruptions dated to about 8,000 years before present;
- the five major lava flows of the Chaîne des Puys;
- the inverted relief of the Montagne de la Serre, which results from erosive action around a Pliocene volcanic lava flow;
- the dammed lakes of Aydat and Cassière, which illustrate the impact of volcanism on the pre-existing topography.

In addition, a buffer zone which covers 16,280 ha has been included, notably in the area between the Chaîne des Puys and the Limagne fault and on the western side of the Plateau des Dômes. The aim of the buffer zone is to protect the area which falls immediately outside the nominated property and to preserve the main viewpoints which overlook the volcanic chain.

The nomination dossier notes that this region has historically been recognized for the inspiring scenic value of the landscape which is associated with its geological values. Since the Neolithic, through Gallo-Roman times and the Middle Ages, to present day, people have been attracted to the rich volcanic soil and clean water of this area. As a result, the landscape of the property is and has been heavily managed for more than 10,000 years.

## 3. COMPARISONS WITH OTHER AREAS

The nomination dossier presents a comparative analysis which IUCN has further considered during the evaluation process.

In relation to criterion (vii), the nomination suggests the volcanic geological origins of the geomorphological features as lending the landscape gentle and harmonious symmetry appreciated since before Gallo-Roman times. IUCN considers these values are significant at national and perhaps regional level, and are not highly distinctive at a global scale. Some of the “Puy” convey the form of volcanic cones where the forest or pasture have been managed to expose the crater rims. However, many of the eighty cones are hidden by forest and / or are indistinguishable from other hilly rolling pastoral landscapes.

Furthermore, it is difficult to appreciate the other geological attributes of the landscape without interpretation by a specialist. Whilst views of the landscape are pleasant, these are not easily described as spectacular or unique, and certainly are not so in relation to criterion (vii) as it is applied to natural landscapes.

Existing European volcanic landscapes already inscribed on the World Heritage List are better known globally (e.g. Isole Eolie (Aeolian Islands), Italy; Mount Etna, Italy; Teide National Park, Spain). More impressive volcanic landscapes are also already listed (e.g. El Pinacate and Gran Desierto de Altar Biosphere Reserve, Mexico; Grand Canyon National Park, United States of America; Hawaii Volcanoes National Park, United States of America) where key features are much less eroded, and where vegetation does not mostly hide or obscure the underlying geological forms.

Similar pastoral landscapes to that in the nominated property can be found elsewhere in France and in Western Europe. There are no views in the nominated property of spectacular contrast in height, width, depth, slope angle, or complexity, and the mission noted superlatives are generally not used to describe the landscape and its features. Other volcanic landscapes not yet inscribed on the list of World Heritage Sites are better known globally for their stunning volcanic scenery and landscapes (e.g. Auckland Field, New Zealand; Craters of the Moon, United States).

In relation to the application of criterion (viii), the nomination considers four geological attributes. These include: 1) the Limagne fault, 2) the Variscan granitic basement, 3) the inverted topography as displayed at Montagne de la Serre, and 4) the Chaîne des Puys (with its cones and lava flows).

The comparative analysis in the nomination is focused almost exclusively on the volcanic features of the site. It considers comparisons with many monogenetic volcanic sites and features; however, it does have several shortcomings and misses a range of sites that are notable for (1) their high degree of “intactness” and lack of erosion owing to their occurrence in arid environments; (2) their youthful age – some with historical eruptions; and (3) their relative remoteness and naturalness, and sometimes limited access. These sites include places that are either in current World Heritage Sites (Grand Canyon National Park, United States of America; El Pinacate and Gran Desierto de Altar Biosphere Reserve, Mexico), in Geoparks (Kaniwinka, Australia), in other protected or managed areas (Petroglyphs National Monument, Albuquerque volcanic field, New Mexico; Sunset Crater National Monument, Arizona; Pali Aike, Chile-Argentina) or proposed for future protected status in the UNESCO Global Geopark Network (Auckland field, New Zealand; Al Madinah, Saudi Arabia). In short, there is no lack of more significant monogenetic volcanic fields, already recognized on a global scale.

In terms of the history of science, the Chaîne des Puys has been clearly important as a European field site for understanding volcanology in the 18th and early 19th centuries.

The majority of scientific papers about the Chaîne des Puys volcanic area published in the past 60 years (post-WW II period) have been published in French national scientific journals, and as academic theses from mainly French universities. These journals are mostly of interest at a national scale and few of the articles about the Chaîne des Puys are published in the principal international volcanological science journals. Of the 52 articles cited in the dossier bibliography under the “Volcanology” heading and referring to the Chaîne des Puys, 45 articles - or 86% - are from French journals or theses emanating from French universities. In the past several years since initial preparation of the dossier, there has been an upsurge in science articles in international journals owing largely to the addition of several topical articles by faculty and students at the university of Clermont-Ferrand and colleagues.

Recent global reviews of monogenetic volcanism in the peer-reviewed literature (Nemeth, 2010; de la Cruz-Reyna and Yokoyama, 2011; Kereszturi and Nemeth, 2012; Valentine and Gregg, 2008) usually do not mention or highlight the Chaîne des Puys as a significant volcanic field. Some independent expert reviewers provide supportive comments on the nomination; however a significant number of reviewers did not

support the recognition of the property as being of Outstanding Universal Value as a natural World Heritage Site.

As explained in the background note, volcanic nominations have had particular guidance from the World Heritage Committee, noting the limited scope for further such listings. IUCN notes that the nominated property was not recommended as a priority site in the most recent IUCN World Heritage thematic study. In relation to the recent listing of El Pinacate and Gran Desierto de Altar Biosphere Reserve (Mexico), the phenomenon of the monogenetic volcanic field is more extensive, in greater natural state and better exposed than that in the present nomination. Nonetheless this aspect alone was not regarded as being of Outstanding Universal Value, and the listing also encompassed significant desert landscapes. The monogenetic volcanic field of Wudalianchi National Park (China) is a larger, less altered area than the present nomination, and presents stronger values as a natural landscape. However, IUCN’s evaluation of this property concluded it did not meet criterion (viii). Thus, consistency with past recommendations and decisions also does not support the application of natural criteria to the present nomination.

In conclusion the nominated property does not compare favourably with other properties on the World Heritage List nor with several other areas which are not inscribed.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

The nominated property is located within Auvergne Volcanoes Regional Nature Park (PNRVA), established in 1977 (an IUCN Protected Area Management Category V – Protected Landscape/Seascape). The nominated property is subject to various State, Regional, Departmental and communal laws and regulations which govern the environment, urban development, quarries, tourism, natural resource management (forestry, water, soils) and agriculture. A range of regulations, explained in the nomination, are designed to ensure the balance between the needs of populations and the protection of the environment, preservation of areas allocated to agricultural and forestry activities, and the protection of sites, circles and natural landscapes. They must also comply with the provisions specific to mountain areas which are part of the property and the buffer zone.

The nominated property contains a range of legal land tenures. These include privately owned land (individuals or private companies), public land (State, Region, Municipality, or Commune) and commons. One state land owner, the military which holds an installation on the summit of Puy de Dome, has yet to fully engage in the management process, although talks are underway to refurbish and improve the visual aspect of this area. Accompanying the nomination dossier were over a

dozen maps showing the very complex landownership boundaries.

Whilst in broad terms the existing protection regime is relevant to a multi-use landscape, it does not appear to be strict enough for a property potentially to be inscribed on the World Heritage List for its natural values. As noted below, the property as nominated includes 3 active quarries, which is of concern given the position of the World Heritage Committee that extractive industry is considered to be incompatible with World Heritage Site status.

IUCN considers the protection status of the property does not meet the requirements of the Operational Guidelines.

## 4.2 Boundaries

The boundaries of the nominated property encompass more than 90% of the volcanic features in the Chaîne des Puys including all of the major features likely to attract public and scientific attention. The boundaries also take into account building rights, local management rights and other land-use practices and traditions. The boundaries are based on the threefold protective regulations of the charter of the PNRVA, the plan for coherent management of Greater Clermont, and the classification of the site following the French National Law of 1930 on natural monuments and sites. The boundaries are extremely complex and may be difficult to operate in practice.

The buffer zone is indicated clearly on the maps but is not easy to identify in the field. The buffer zone serves to simplify the boundary where the management plan is being implemented. Certain key viewpoints visited during the field mission are outside the property and its buffer zone. A strangely configured central buffer zone connects the chain of volcanoes to the Limagne Fault. There is a small south-west buffer zone, and the remaining two buffer zones essentially encircle the property in a rough “C” shape. The buffer zone increases the number of communes involved as stakeholders in the management of the property, however its function in terms of providing effective protection is not clear. The buffer zone design is not fully effective in relation to providing consistent wider protection of the nominated property.

IUCN considers that the boundaries of the property and buffer zone do not fully meet the requirements of the Operational Guidelines.

## 4.3 Management

The area nominated for inscription falls under the jurisdiction of PNRVA. The Management Authority of PNRVA is a regional body of the Government Council of the Auvergne Region. PNRVA has 48 staff although they are not all dedicated to the nominated property. Only a limited number of the staff for the Regional Nature Park

are responsible for the area nominated. This includes the Park Manager and 6 rangers (4 full time and 2 part time). The Conseil General of the Puys-de-Dôme has a unit of 5 staff dedicated to World Heritage issue in anticipation of inscription.

The charter for PNRVA 2013-2025 guides policy, governance, management and priorities within the entire PNRVA. Within this document specific reference has been made to the values forming the basis of the nomination. There is a two-year (2012-2013) management plan for the nominated property; it serves to integrate and operationalize the various overlapping and inter-related regulations and zones present in the property. It is implemented in both the nominated property and the buffer zone.

The management plan for the property is adequate in relation to the multiple landscape use of the property, and addresses all threats and proposes mitigation actions. IUCN notes that the management plan only has a short timeframe and could benefit from greater prioritisation particularly on actions relating to large sporting events, school groups and recreational visitors. Traditional management approaches are used in the forestry and agricultural sectors; both of these sectors receive support from national authorities as well as regional, municipal and communal governments. It should be noted that agricultural activities particularly related to pastoralism and summer pasture grazing is subsidised via grants, government projects and other initiatives.

The management plan for the nominated property had not been fully implemented at the time of the evaluation mission although many activities were underway. The plan refers to indicators and a monitoring and evaluation framework which has not yet been implemented.

The most significant weakness relating to management and enforcement is the lack of enforcement capacity on privately-owned land. Large numbers of visitors stray from footpaths and tracks and use mountain bikes, all of which worsen soil erosion and lead to degraded integrity. During the high season illegal parking and high traffic levels further affect the integrity of the nominated property and results in conflict between owners, managers and the visitors.

Maintaining the variety and complexity of conservation funding sources related to current and future financing of the nominated property presents a significant management challenge. In the long-term it seems unlikely that the nominated property will be in a position to be self-sustaining and that future viability of the property rests heavily on continued external funding.

IUCN considers that the management of the property does not fully meet the requirements of the Operational Guidelines.

#### 4.4 Community

There has been extensive stakeholder involvement in the nomination process, development of the management plan, and earlier processes relating to the park and its various zones. For the nomination as a whole, this engagement has either been coordinated by the team leading the nomination from the General Council of the Puys de Dôme Department or by the Management Authority of the Natural Park. For sector specific issues such as relating to forestry, quarries and some aspects of development and agriculture, particular government ministries have been involved such as the National Forestry Office (ONF) and the Environment Ministry.

There are several hundred individual landowners most of whom engage with the different levels of government or other stakeholder groups through various associations. The largest landownership association is the Puy de Dome Association.

The preparation of the nomination dossier has brought together stakeholders that did not previously have any platform for regular dialogue. The project coordination team of General Council of the Puys de Dome and the Park Management Authority has developed an integrated and complementary approach to resolving conflict and fundraising. Consent has been built gradually over time. Evidence of this can be seen by the increased membership in associations and participation in meetings and engagement with the management authorities.

#### 4.5 Threats

The landscape of the property has been heavily managed for more than 10,000 years. Key visible expressions of this history of land use include degradation and erosion of the cones (Puys) from grazing, agricultural practices, forest growth, footpaths and tracks, recreational use, and quarrying activities (including some active quarrying), as well as complete coverage of the lava flows by dense forest. The property also contains several communication and transport networks including major and minor roads, car parks, a railroad line, electricity pylons, phone lines, and a major and visually intrusive military and public telecommunications centre at the summit of the Puy de Dôme. About 30 communes are included in the property boundaries (approximately 4,000 inhabitants) with more than 25,000 inhabitants in the buffer zones. These villages are prized for residential sites and as weekend and vacation retreats. These long-standing uses generate impacts on the natural values of the property and its integrity, and the landscape of the property is substantially not primarily natural but more of a combination of cultural and natural values.

Many of the lava flows and volcanic cones have been quarried for buildingstone, roadstone, and pozzulan (volcanic cinder). There are several active quarries

within the boundaries of the property (Puy de Toupe, Puy de Cliersou, and Puy de Nugere).

Cinder cones within the Chaîne des Puys often have clear morphological expression, but even these are affected by human activities including grazing, quarrying, and forest practices. Several of the cones have been partially or totally mined out such as Puy de Tenusset and Puy de Lemptegy, thereby impacting their natural appearance.

Thus, many of the original natural phenomena have been altered through human activities (grazing, agricultural practice, quarrying, military and communications installations, as well as a variety of recreational activities).

There are a range of ongoing uses and pressures on the property, including:

- Urbanization and growth of Clermont-Ferrand. In particular pressure on the Limagne Fault and its forests and vegetation zone which is cut off from the surrounding landscape by the urban areas and roads.
- Current levels of use are degrading the nominated property. Use currently leads to high levels of erosion requiring intensive investment in establishing paved, wooden and cordoned footpaths. The mission noted comments of a number of the major stakeholders that the landscape cannot handle current visitation and its impacts. Concern was voiced during the IUCN mission over what level of increased visitation would be felt if the site receives World Heritage recognition.
- At present there seems to be no comprehensive planning of and for tourism because few policies are in place at the National and regional levels. Such planning is anticipated in the future, but not presently available throughout the year with peak intensity in July and August.
- Current visitation already exceeds the current management capacity to ensure compliance with recommendations to reduce erosion. A number of stakeholders noted that current public transport facilities are limited; parking is limited for both normal cars and camping vans leading to illegal parking on the side of roads.

In summary, IUCN considers the integrity of the property in relation to its natural values is compromised by the long standing and on-going impacts of human use, which result in a landscape that is fundamentally not “natural”. The nominated property is a multi-use landscape, and whilst its protection and management is appropriate to such a situation, it is not adapted to the requirements under the Operational Guidelines for listing as a natural property. There is a specific concern that there are active extractive industries located within the boundaries of the property, and this is not compatible with World Heritage status.

IUCN considers that the integrity, the protection and the management of the nominated property do not meet the requirements of the Operational Guidelines.

## 5. ADDITIONAL COMMENTS

### 5.1 Possible Geopark status

IUCN considers there are many creditable aspects of the nomination, such as the careful and professional process of community engagement that has been undertaken. This process has also created new awareness and partnerships regarding the nominated property.

The nominated property clearly does present geological values that are of interest, and its cultural and natural values create a cultural landscape, with an interesting history. Given the motivation for this nomination, the mechanism of Global Geopark status may have potential to be an appropriate mechanism for the recognition of this area, focusing on the geological values but enabling an integrated approach to considering the wider landscape and all of its values. This mechanism would also provide a focus for engagement in the challenge of supporting conservation and providing for sustainable tourism. IUCN recommends that the State Party consider building on the considerable investment in the nomination to date through the development, with the support of the UNESCO Science Sector and the European Geoparks Network (EGN), of a national Geopark, that could have potential for inclusion in the Global Geoparks Network (GGN). IUCN's comments here should be seen as without prejudice to any future decision of the GGN or EGN.

### 5.2 Upstream Process

IUCN notes that the present nomination provides a clear demonstration of the importance of the proposed Upstream Process. The recommendations to States Parties as recently incorporated by the World Heritage Committee into the Operational Guidelines (2012) - paragraph 122, that recommend feasibility studies before embarking on a full nomination process would have been particularly relevant in this case. These recommendations respond directly to the lessons learned in the Upstream Process and discussed in the Committee over the last 3-4 years.

IUCN recommends that the World Heritage Committee provide greater emphasis to supporting States Parties, the World Heritage Centre, and the Advisory Bodies to make these provisions more effective.

## 6. APPLICATION OF CRITERIA

The **Tectono-volcanic ensemble of the Chaîne des Puys and Limagne Fault** has been nominated under natural criteria (vii) and (viii).

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

The landscape of the nominated property is not scenically outstanding when assessed at a global scale. The geological phenomena in the property are of national/regional significance but require considerable interpretation and explanation to appreciate, and are surpassed in significance by many other existing World Heritage Sites, and other protected sites globally. The long history of use of the site, and the variety of land use practices (farming, grazing, forestry, quarrying) result in a landscape that is not primarily natural, but a combination of the interaction of people with nature. The nominated property does not meet the integrity requirements for the application of natural World Heritage criteria.

IUCN considers the nominated property does not meet this criterion.

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

The nominated property, notably the monogenetic volcanic field which is the most prominent of its attributes, is well-known at the national, and to a lesser extent, regional levels.

There are a number of both World Heritage properties, and other sites, that are better suited to represent this feature, including a range of key sites omitted from the comparative analysis in the nomination. While the volcanic features within the nominated property have served the European scientific community well as a "field laboratory" during the 18th, 19th, and early 20th centuries, more recently volcano scientists have worked elsewhere owing to better exposures, more youthful volcanic deposits, and where there is evidence of recent on-going volcanic activity.

Past consideration of volcanic nominations by the World Heritage Committee, IUCN's thematic work on volcanoes, recent global reviews on monogenetic volcanism and the present evaluation of the property do not justify a claim for Outstanding Universal Value. The property also does not meet the integrity requirements for recognition as a natural World Heritage Site, with a wide range of significant and on-going human impacts on its natural attributes.

IUCN considers the nominated property does not meet this criterion.

## 7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC-14/38.COM/8B and WHC-14/38.COM/INF.8B2;

2. Decides not to inscribe the **Tectono-volcanic Ensemble of the Chaîne des Puys and Limagne Fault (France)** on the World Heritage List under natural criteria.

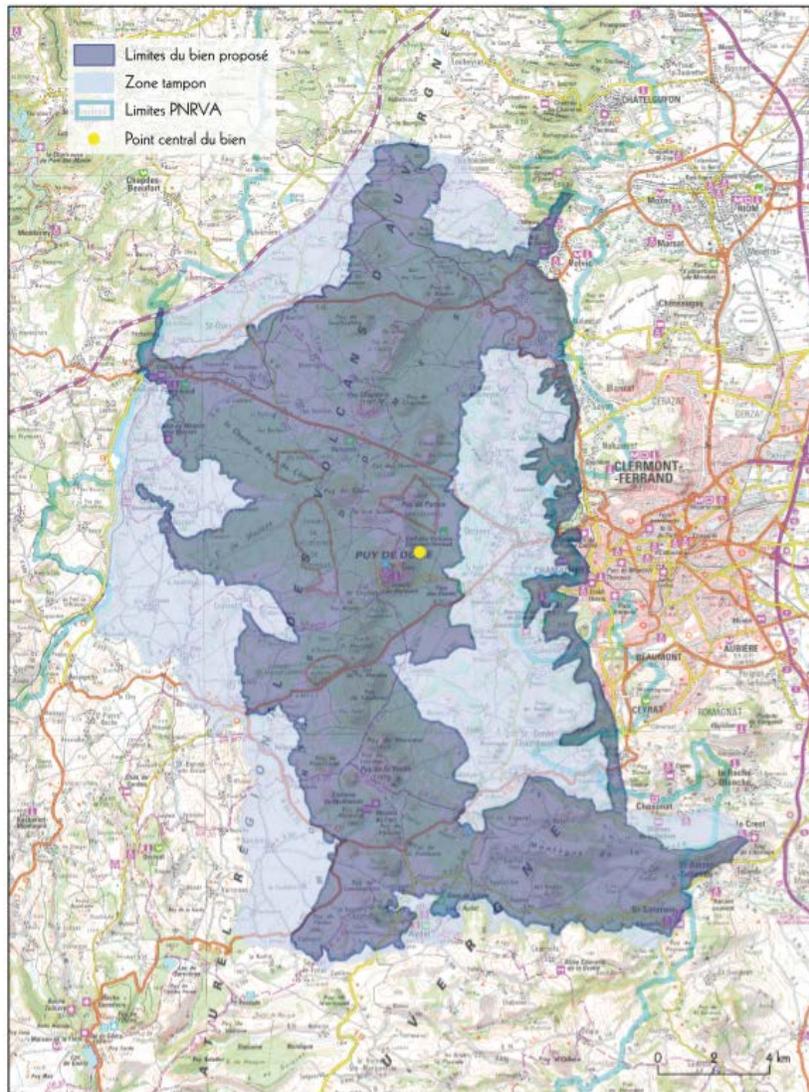
3. Expresses its appreciation to State Party, and the local stakeholders and communities for their on-going commitment towards the protection and management of the landscape and heritage of this region.

4. Recommends the State Party to consider nomination of the Tectono-volcanic Ensemble of the Chaîne des Puys and Limagne Fault as a national and/or UNESCO Global Geopark, as this appears to be the most appropriate mechanism to recognise the earth science values of this area, and so strengthen its protection and management.

**Map 1:** Nominated property location



**Map 2:** Nominated property and buffer zone



**EUROPE / NORTH AMERICA**

**BIALOWIEZA FOREST**

**(Extension and renomination of “Belovezhskaya Pushcha / Białowieża Forest”, Belarus/Poland”)**

**POLAND / BELARUS**





## WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

### BIALOWIEZA FOREST (POLAND / BELARUS) – ID No. 33 Ter

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** To approve the extension under natural criteria, with follow up State of Conservation report on the existing and extended property.

**Key paragraphs of Operational Guidelines:**

Paragraph 77: Nominated property, with extension, meets World Heritage criteria.

Paragraph 78: Nominated property with extension meets integrity requirements, but requires strengthened protection and management requirements.

**Background note:** The Bialowieza National Park (Poland) was inscribed on the World Heritage list in 1979 (Decision 03COM XII.46). In 1992 the Committee inscribed Belovezhskaya Pushcha State National Park (Belarus) as an extension of the Bialowieza National Park of Poland (Decision 16Com X.A), and renamed the property Belovezhskaya Pushcha / Białowieża Forest. In 1999 the Committee commended the State Party of Poland for their initiative to expand the property but decided not to include the proposed extension into the existing World Heritage site, noting that the proposed extension would provide an important contribution to the biodiversity of the Polish part, in particular, through oligotrophic pinewoods, but would not be significant for the World Heritage property as a whole (Decision 23COM VIII.A.2). In several decisions the Committee requested the States Parties to create a joint management structure for the whole World Heritage property and improve transboundary cooperation (e.g. Decisions 28COM 15B.20 and 31COM 7B.30). Furthermore, in 2006, the Committee encouraged the States parties to explore the possibilities of extending the whole transboundary World Heritage property (Decision 30COM 7B.20).

#### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 20 March 2013

**b) Additional information officially requested from and provided by the State Party:** Following the technical evaluation mission the States Parties were requested to provide supplementary information on 13 December 2013. The information was received on 25 February 2014.

**c) Additional literature consulted:** Various sources, including Bruijn, O. de & M. Vegh (editors), (2007). **Bialowieza Forest Cross-border Ecological Network – A Forest of Hope.** Council of Europe (2007). **Requests of Poland, Belarus and Romania concerning the possible revisions of the decisions of the Group of Specialists -European Diploma – to be examined by the Standing Committee of the Bern Convention.** Directorate of Culture and Cultural and Natural Heritage (2010). **Progress report to the Council of Europe of the Polish Government concerning the Białowieza National Park.** Heiss G., Patry M. (2008). **Reactive monitoring mission report. Belovezhskaya Pushcha / Białowieża Forest.** IUCN (1979). Białowieza National Park. Advisory Body Evaluation. IUCN (1992). Belovezhskaya Pushcha State National Park (Belarus). Advisory Body Evaluation. Krzyściak-Kosińska R., Arnolbik V., Antczak A. (2012). Kuijken E. (2010). **European Diploma of Protected Areas.** Belovezhskaya Pushcha - Management Plan: Peer review (first draft). Mazurek L., Jezierczuk T.

(2011). **Bialowieza A Site Guide.** Wild Poland Site Guides. IUCN SOC reports.

**d) Consultations:** 11 desk reviews received. The mission also met with representatives from the National Park „Bialowieza Forest”; from NGOs; from BNP; from the Polish Ministry of the Environment; the Belarus Ministry of Natural Resources and Nature Conservation; from the Regional Directorate of the Protection of the Environment; the Director and Vice Director of General Directorate of State Forest Administration; and many other stakeholders.

**e) Field Visit:** Pierre Galland and Elena Osipova, 19-24 September 2013

**f) Date of IUCN approval of this report:** March 2014

#### 2. SUMMARY OF NATURAL VALUES

The Bialowieza Forest (BF) is a large forest complex located on the border between Poland and Belarus.

The existing transboundary World Heritage property at present comprises an area of 92,669 ha, 5,069 ha of which is located in Poland and the remaining area in Belarus. The present nomination proposes a significant modification of the boundaries, resulting in a 5,291 ha decrease of the Belarusian part, in much better configured boundaries, and including a large extension of the Polish part of the property from 5,069 ha to 59,576.09 ha. New buffer zones are also proposed with

an area of 130,873.4 ha in Belarus, and an area of 35,834.91 ha in Poland. The extended transboundary property would have a significantly larger total area of 141,885 and a new buffer zone of 166,708.

The States Parties also propose a new simplified name for the property: Bialowieza Forest.

BF is located in the boreo-nemoral biogeographical region and is situated in the transition area between continental and sub-boreal climate zones. Some Atlantic climate elements are perceptible here as well. BF is located in the transition zone of the European lowland deciduous forests and the Eurasian coniferous forests, and protects a diversity of natural forest types and associated ecosystems. The nominated property includes a large area with substantially undisturbed natural vegetation that mainly includes old-aged deciduous and coniferous forests. The forest vegetation in BF is dominated by fresh oak-linden-hornbeam forest. The second most significant forest communities are ash-alder flood plain forests, and bog-birch forest (*Thelypterido-Betuletum pubescentis*). Other forest communities are thermophilous oak-hornbeam forest, thermophilous pine-spruce forest and mosaics of humid pine forest. Non-forest ecosystems include natural bog areas. The boggy ecosystem structure includes lowland hollow bogs with the prevailing gramineous/sedge and mixed herb/sedge associations. The large Dikoye bog occupies the north-eastern part of the nominated property. In addition wet meadows contribute to the biodiversity values.

The different types of forest and communities are inseparably linked within the overall ecosystem of the nominated property. An important aspect of the Bialowieza Forest – especially for the big mammals – is the overall size of the largely undisturbed forest. The nominated property's naturalness and long history of lack of exploitation, manifested in the mature structure of the ecosystem, and extensive presence of old trees and dead wood are also key features. Non-forest communities, situated mainly in the river valleys, are extremely important contributors to overall biodiversity. Insects such as butterflies and dragonflies occur there. A gradient of different habitat types may be observed across the river valleys. The property is exceptional at the European scale with regard to its undisturbed forest and associated ecosystems.

In terms of flora, there are no endemic species in the BF. There are, however, relicts of times when different climatic conditions dominated. There are over 1,060 vascular plant species and an estimate of over 400 lichen species. Recent data confirms over 230 bryophyte species, 71 liverworts and 2 antocerotes. Waterbodies and watercourses support all main groups of phytoplankton and are characterized by high taxonomic diversity (over 200 species). The phytoplankton community includes 250 species.

In terms of its mycoflora, BF can be considered one of the most important refuges for large-cap fungi (macromycete) in the whole boreo-nemoral region. Just in a small area of 10,000 ha, over 1,600 macromycete species were listed. Out of 33 macromycete species regarded as critically endangered in Europe, at least 5 occur in the BF.

The property supports 59 mammal species, including the iconic symbol of the BF: the European bison. There are approximately 900 individuals, representing 25% of the total global population and over 30% of free-living animals. These are a reintroduced population. In 1919 the last European bison in the BF was killed by poachers. Ten years later, a breeding program was set up to conserve the species and to bring it back into the wild. In 1952 the first two individuals were released into forest and two years later the group of 16 bison was reintroduced. Other mammals present include roe deer, red deer, elk and the wild boar, and are preyed on by the grey wolf and lynx. Smaller predators like otter, weasel, marten and their relatives, are also abundant. Many small mammals: shrews, voles, mice, dormice, other rodents and insectivores, also have their home in the forest.

254 bird species have been recorded in the Bialowieza Forest to date and 170-180 of them nest in the property. The property is especially abundant in raptor birds (15 species), owls (8 species), woodpeckers (9 species) and leaf-warblers (23 species). Notable breeding bird species in the BF include white backed woodpecker, three-toed woodpecker, short-toed eagle, booted eagle, lesser spotted eagle, Eurasian pygmy owl, great grey owl, and the Eurasian eagle-owl.

BF is home to 7 reptile species among which the most rare and charismatic is the European pond tortoise *Emys orbicularis*. The most common species are *Natrix natrix*, *Anguisfragilis* and *Zootoca vivipara*. There are 13 amphibian species in the BF. And according to the existing data there are 31 fish species representing 11 families.

There are over 12,000 invertebrate species recorded from the BF, but it is estimated that the actual total may be up to 20,000. Each year new species are described from the nominated property. The nomination lists 70 species new to science described since the 1960s, including algae, mycota, protista, nematodes and flies. The old-growth forests are home to a diversity of saproxylic species (species associated to dead wood), which require large and old (over two-hundred-year) trees and undisturbed conditions to survive.

IUCN also notes that the renomination also includes a significant extension and consolidation of boundaries of the existing property. The new boundaries include all the most significant areas of old-growth forest, which ensures that the most valuable areas of Bialowieza Forest are included in property. These include important areas used by key species in the property, including the

European Bison. Thus the extension reinforces the integrity of the property, and recognition of attributes important for the application of both criterion (ix), in terms of the extent of forest ecosystems of high conservation value, and criterion (x), notably in terms of species associated with these old-growth areas.

### 3. COMPARISONS WITH OTHER AREAS

The existing World Heritage property was amongst the very first inscriptions and dates from 1979. The recognition under current criterion (vii) (but note the amendments to criteria over time) has been a constant source of comment, and is considered to reflect the interpretation and use of this criterion that prevailed in the early years of the Convention. However IUCN agrees with the renominating States Parties that this criterion, in its current definition, does not apply to Białowieża Forest and that biodiversity criteria should be more appropriately applied. In terms of the current application of the concept of natural beauty, the property, though recognized at the European level, does not have an Outstanding Universal Value, and nor does the bison population correspond to the natural phenomenon component of criterion (vii). As a renomination, the consideration of the application of the criteria needs to have regard to the existing status of the property on the World Heritage List, and the World Heritage Committee's decision at the time of first inscription.

The existing World Heritage site Belovezhskaya Pushcha / Białowieża Forest is the only existing World Heritage site in the Boreo-nemoral Udvardy province and in the Central European mixed forests terrestrial ecoregion. The existing forest ecosystem of primeval character justifies the application of criterion (ix). This complex of forests is unique due to its high conservation status with old growth forests almost undisturbed in the core zone. A large section has been almost completely preserved from exploitation and natural processes are on-going. The consequence is the richness in dead wood, standing and on the ground, and consequently a high diversity of fungi and saproxylic invertebrates. The nominated property displays an exceptionally well conserved and large forest area with a significant buffer zone. The long tradition of research on undisturbed lowland forest ecosystem and the numerous publications, including description of new species, also contributes to the values of the nominated property.

Due to its size and conservation status as an old growth forest with large amount of standing and fallen dead wood, the nominated property is particularly rich in birds, saproxylic insects and fungi. Several new species have been described here and many threatened species are still well represented. The property is home to the largest free-roaming population of European Bison.

IUCN's recent thematic study on Terrestrial Biodiversity and the World Heritage List, notes the existing property

as amongst the 7 most irreplaceable natural World Heritage properties that are not already recognized for their biodiversity, and within the 1,000 most irreplaceable protected areas for biodiversity. These findings also support the application of criteria (ix) and (x) to reflect the existing inscription of the property on the World Heritage List. The significant extension of the existing property also reinforces the application of both criteria through adding new areas of forest ecosystems, and increased function in the protection of threatened species.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

There are effective legal protection measures in place for the property, but the distribution of management responsibilities in Poland, between the National Park and the Forest Administration, is a potential major constraint in achieving the integrated management of the property. In order to effectively address this situation, the State Party of Poland has developed and signed (October 2013) an agreement establishing a Steering Committee between these two administrations. The situation is simpler in Belarus; the whole property is managed by the National Park Authority, which is directly under the President's cabinet. Practically the whole of the nominated property area is state-owned, both in Poland and in Belarus. The relationship with local land owners in the park (very few) and around it seems to be good.

IUCN considers the nominated property meets the protection requirements of the Operational Guidelines.

### 4.2 Boundaries

The nominated extension is a significant addition to the integrity of the existing inscribed property. As per the background note, many past analyses by the Committee, as well as in other studies, have underlined the recommendation to include the forests surrounding the National Park in Poland and to ensure their effective management and conservation. On the Belarus side major efforts have been made to establish more coherent boundaries for protection and consistent management measures.

The new boundaries appear to be appropriate, and result in an increase in the integrity of the property; they cover about 80% of the total forest areas of the Białowieża region, including all the most valuable old growth forests. In addition, the new boundaries are more coherent than the previous ones, particularly in Belarus, facilitating effective management.

Land zonation in relation to the management of the property and adjacent landscape seems adequate, and is achieved through the establishment of a large buffer zone. In Poland the boundaries of the proposed buffer

zone follow the borders of the Zone II of the Bialowieza Biosphere Reserve. In Belarus the buffer zone boundaries also largely follow the boundaries of the Belovezhskaya Pushcha Biosphere Reserve. It will be essential that the ongoing management ensures a clear understanding of the function of the World Heritage property buffer zone, Biosphere Reserve buffer zone and National Park buffer zone, and coherence and simplification of these is needed.

Due to the large size of the nominated property and its isolation within the surrounding agriculture zones, wider connectivity with other natural areas is an issue.

One important issue to note is the presence of high barbed wire fences along the national border. This obstacle prevents exchanges of large mammals between Poland and Belarus; however IUCN notes that there is an active discussion on the benefits to the management of genetic diversity in the bison populations in Poland and Belarus through maintaining the fence. IUCN considers it is essential that the two States Parties monitor the impacts of the border fence and consider the options to improve connectivity within the property, and to facilitate wildlife movement.

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

### 4.3 Management

All bodies responsible for the management of the property (Bialowieza National Park and Forest Administration in Poland, and Belovezhskaya Pushcha in Belarus) appear to be relatively well-resourced in terms of human and financial resources. On both sides there are large teams including scientists, managers, communication officers, etc. In Belarus the Belovezhskaya Pushcha National Park is considered a high priority area and it receives significant budget allocations from the government; its budget appears secure in the long-term. In Poland the Forest Administration appears to have a significant budget secured by its commercial activities; however there is a need to clarify the additional budget that will be allocated for the management of the proposed extended property.

A management plan for the National Park exists in Belarus, but was not provided with the nomination dossier. The plan was submitted in February 2014 as supplementary information. In Poland all forest areas have forestry management plans and there is also a legal requirement to develop and implement management plans for protected areas. The new Management Plan for the Bialowieza National Park in Poland has not yet been approved, but it is expected that it will be finalized and officially adopted in 2014. In addition the field mission noted that the protection regime for forests outside of the National Park in Poland needs to ensure an integrated management plan for the whole nominated property. IUCN notes that the Council

of Europe Diploma held by BNP is currently suspended due to the lack of approval of the management plan.

The IUCN field mission also noted there is no single joint management structure in place and it is not clear whether the Joint Management Framework, the text of which was provided during the mission, had been formally adopted.

In February 2014 the State Parties submitted supplementary information, including copies of recently signed agreements: the Agreement between the Bialowieza National Park and the Forestry Administration in Poland on the establishment of a Steering Committee for the World Heritage property. The Bialowieza National Park, the Polish Forestry Administration and the Belovezhskaya Pushcha National Park have also very recently signed an agreement regarding preparation and implementation of the management plan for the nominated property. The agreement also mentions that within 60 days from February 11<sup>th</sup> 2014 an agreement on establishment of a transboundary steering committee will be prepared. The transboundary steering committee will then prepare a management for the whole transboundary property which will be presented to the World Heritage Committee.

Thus at present, in spite of the lack of a formal agreement, there seems to be good transboundary cooperation between the teams of the two national parks, as well as the Forest Administration. However, this cooperation needs to be officially institutionalized and the two recently signed agreements demonstrate the willingness of the involved organizations to move rapidly in this direction. The World Heritage Committee may wish to seek an update on the progress with the above, with the State of Conservation reporting process.

IUCN considers that the management of the property as currently listed does not meet the requirements of the Operational Guidelines, but with the actions to be undertaken and the timeframe proposed by the States Parties for implementation, as noted in the supplementary information to the nomination, the main deficiencies should be addressed.

### 4.4 Community

Coordinated governance and joint management is still at an embryonic state, though the preparation together of the nomination dossier has been a major step to increase the involvement and support from local communities in the management of the property.

NGOs and other partners met during the mission expressed consistent support for the renomination and extension, which is a long-awaited proposal and they see as an opportunity to strengthen the conservation of the property. They noted the importance that the corresponding management measures required for the

extended property are definitively adopted and effectively implemented and enforced.

#### 4.5 Threats

The nominated property is effectively protected, and whilst some areas of forest have been exploited in the past, most of these areas are recovering through natural succession. Non-forest areas have been maintained through active management in the past, including through grass and reed cutting. This will be continued; it also provides winter food for the bison, and assists in managing grazing damage and thus contributes to forest recovery. It also keeps open habitats for several important bird species.

There are a range of roads in the property, and some are still maintained without any obvious justification. Forest fire is a potential threat, though only very limited fires happened in the last few years. Climate change might affect the forest ecosystem distribution in future and also may increase the danger of forest fires. Miles of fire prevention corridors are also maintained inside the property. IUCN recommends that the States Parties carefully assess the real need for maintaining these roads and fire prevention corridors, and reduce their numbers through a programme of rationalization, accompanied by appropriate monitoring. As noted above, the function of the border fence and its impacts on connectivity also require continued monitoring.

Tourism development does not appear to be a threat, due to the size of the property and the good protection of its core values (old forest stands).

Overall the most significant threat to the nominated property is the lack of an integrated management plan and risk of ineffective protection and management of the property. In the case of the State Party of Poland, there are divided responsibilities for management between the National Park and the Forest administration. Thus the action to address the weaknesses in the overall effective and integrated management of the property as a whole represents the most significant action required by the States Parties, in relation to the possible inscription of the extended property of Białowieża Forest on the World Heritage List.

IUCN considers the property meets the expected conditions of integrity, but that action is needed, to be followed via the State of Conservation process, to ensure both the existing property and the extended area meet fully the protection and management requirements of the Operational Guidelines.

#### 5. ADDITIONAL COMMENTS

None.

#### 6. APPLICATION OF CRITERIA

**Białowieża Forest** has been nominated under natural criteria (ix) and (x) as an extension of the existing Belovezhskaya Pushcha / Białowieża Forest, currently inscribed under criterion (vii).

##### **Criterion (ix): Ecosystems/communities and ecological/biological processes**

Białowieża Forest conserves a diverse complex of protected forest ecosystems which exemplify the Central European mixed forests terrestrial ecoregion, and a range of associated non-forest habitats, including wet meadows, river valleys and other wetlands. The area has an exceptionally high nature conservation value, including extensive old-growth forests. The large and integral forest area supports complete food webs including viable populations of large mammals, large carnivores (wolf, lynx and otter) amongst other. The richness in dead wood, standing and on the ground, leads to a consequent high diversity of fungi and saproxylic invertebrates. The long tradition of research on the little disturbed forest ecosystem and the numerous publications, including description of new species, also contributes significantly to the values of the nominated property.

The existing property of Belovezhskaya Pushcha / Białowieża Forest is the only existing World Heritage site in the Boreo-nemoral Udvardy province and in the Central European mixed forests terrestrial ecoregion, and the proposed extension to the area adds both new attributes, and increases the integrity of the property.

IUCN considers that the nominated property meets this criterion.

##### **Criterion (x): Biodiversity and threatened species**

Białowieża Forest is an irreplaceable area for biodiversity conservation, due in particular to its size, protection status, and substantially undisturbed nature. The property is home to the largest free-roaming population of European Bison, which is the iconic species of this property. However the biodiversity conservation values are extensive, and include protection for 59 mammal species, over 250 bird species, 13 amphibians, 7 reptiles, and over 12,000 invertebrates. The flora is diverse and regionally significant, and the property also is notable for conservation of fungi. Several new species have been described here and many threatened species are still well represented.

IUCN considers that the nominated property meets this criterion.

The existing World Heritage property was inscribed under criterion (vii). In recommending the support for the nomination under biodiversity criteria, IUCN also consider criterion (vii) does not apply to this nomination taking into account its current definition, and therefore

also agrees with the proposal by the States Parties to no longer apply criterion (vii) to the property.

## 7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC-14/38.COM/8B and WHC-14/38.COM/INF.8B2;

2. Approves the extension of **Bialowieza Forest (Poland, Belarus)** on the World Heritage List under natural criteria (ix) and (x).

3. Adopts the following Statement of Outstanding Universal Value:

### **Brief synthesis**

*Bialowieza Forest is a large forest complex located on the border between Poland and Belarus. Thanks to several ages of protection the Forest had survived in its natural state to this day. The Bialowieza National Park, Poland, was inscribed on the World Heritage List in 1979 and extended to include Belovezhskaya Pushcha, Belarus, in 1992. A large extension of the property in 2014 results in a property of 141,885 ha with a buffer zone of 166,708 ha.*

*This property includes a complex of lowland forests that are characteristics of the Central European mixed forests terrestrial ecoregion. The area has exceptionally conservation significance due to the scale of its old growth forests, which include extensive undisturbed areas where natural processes are on-going. A consequence is the richness in dead wood, standing and on the ground, and consequently a high diversity of fungi and saproxylic invertebrates. The property protects a diverse and rich wildlife of which 59 mammal species, over 250 bird, 13 amphibian, 7 reptile and over 12,000 invertebrate species. The iconic symbol of the property is the European Bison: approximately 900 individuals in the whole property which make almost 25% of the total world's population and over 30% of free-living animals.*

### **Criteria**

#### **Criterion (ix)**

*Bialowieza Forest conserves a diverse complex of protected forest ecosystems which exemplify the Central European mixed forests terrestrial ecoregion, and a range of associated non-forest habitats, including wet meadows, river valleys and other wetlands. The area has an exceptionally high nature conservation value, including extensive old-growth forests. The large and integral forest area supports complete food webs including viable populations of large mammals and large carnivores (wolf, lynx and otter) amongst other. The richness in dead wood, standing and on the ground, leads to a consequent high diversity of fungi and*

*saproxylic invertebrates. The long tradition of research on the little disturbed forest ecosystem and the numerous publications, including description of new species, also contributes significantly to the values of the nominated property.*

#### **Criterion (x)**

*Bialowieza Forest is an irreplaceable area for biodiversity conservation, due in particular to its size, protection status, and substantially undisturbed nature. The property is home to the largest free-roaming population of European Bison, which is the iconic species of this property. However the biodiversity conservation values are extensive, and include protection for 59 mammal species, over 250 bird species, 13 amphibians, 7 reptiles, and over 12,000 invertebrates. The flora is diverse and regionally significant, and the property also is notable for conservation of fungi. Several new species have been described here and many threatened species are still well represented.*

#### **Integrity**

*The property is a large, coherent area conserved via a range of protective designations representing the full range of forest ecosystems of the region, and providing habitat for large mammals. The presence of extensive undisturbed areas is crucial to its nature conservation values. Some of the ecosystems represented in the property (wet meadows, wetlands, river corridors) require maintenance through active management, due to the decrease of water flow and absence of agriculture (hay cutting). The buffer zone that has been proposed by both State Parties appears sufficient to provide effective protection of the integrity of the property from threats from outside its boundaries. There are some connectivity challenges, from barriers inside the property, and its relative isolation within surrounding agricultural landscapes, that require continued management and monitoring.*

#### **Protection and management requirements**

*The property benefits from legal and institutional protection in both States Parties, through a variety of protected area designations.*

*Protection and management requires strong and effective cooperation between the States Parties, and also between institutions in each State Party. The Bialowieza National Park (Poland), the Polish Forestry Administration and the Belovezhskaya Pushcha National Park authorities have entered into an agreement regarding preparation and implementation of an integrated management plan for the nominated property, and to establish a transboundary steering group. In addition the State Party of Poland has developed an agreement establishing a Steering Committee between the National Park and the Forest Administration aiming to achieve a coordinated approach to integrated management. It is essential to ensure the effective functioning of this Steering Committee, including through regular meetings, and its input to transboundary*

*coordination and management. It is essential that the national parks of both States Parties maintain effective and legally adopted management plans, and an adopted management plan for the Bialowieza National Park (Poland), to support its inclusion in the property, is an essential and long-term requirement.*

*It is essential to ensure that the integrated management plan for the property addresses all key issues concerning the effective management of this property, particularly forest, meadows and wetlands management, and that it is adequately funded on a long term basis to ensure its effective implementation.*

*Effective and well-resourced conservation management is the main long-term requirement to secure the property, and maintain the necessary management interventions that sustain its natural values. Threats that require long-term attention via monitoring and continued management programmes include fire management, the impacts of barriers to connectivity, including roads, firebreaks and the border fence. There is also scope to continually improve aspects of the management of the property, including in relation to ensuring connectivity within the property, and in its wider landscape, and to also secure enhanced community engagement.*

4. Commends the State Parties of Poland and Belarus for their efforts to establish agreements aiming to enhance the coordination and effective management of this transboundary property.

5. Requests the State Party of Poland, as a matter of urgency, to:

- a) adopt the new Management Plan for Bialowieza National Park as soon as possible, and by **1 October 2014** at the latest, and to provide a copy of the adopted and approved plan to the World Heritage Centre when available;
- b) establish as a matter of urgency the Steering Committee between the National Park and the

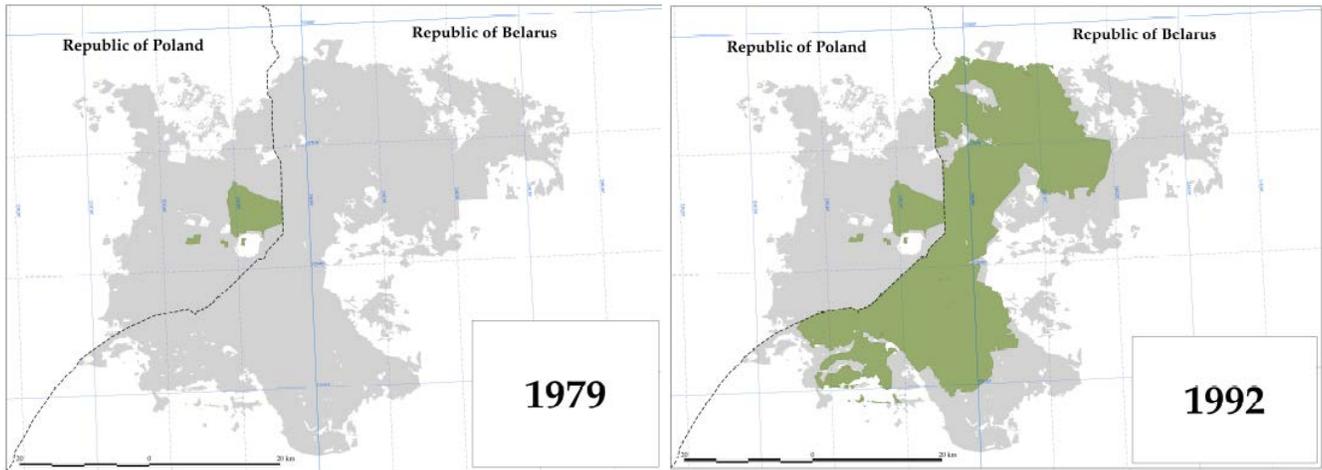
Forest Administration to ensure the integrated planning and management of the Polish side of the property, and to provide adequate financial resources for the effective functioning of this Steering Committee.

6. Also requests the States Parties of Poland and Belarus to:

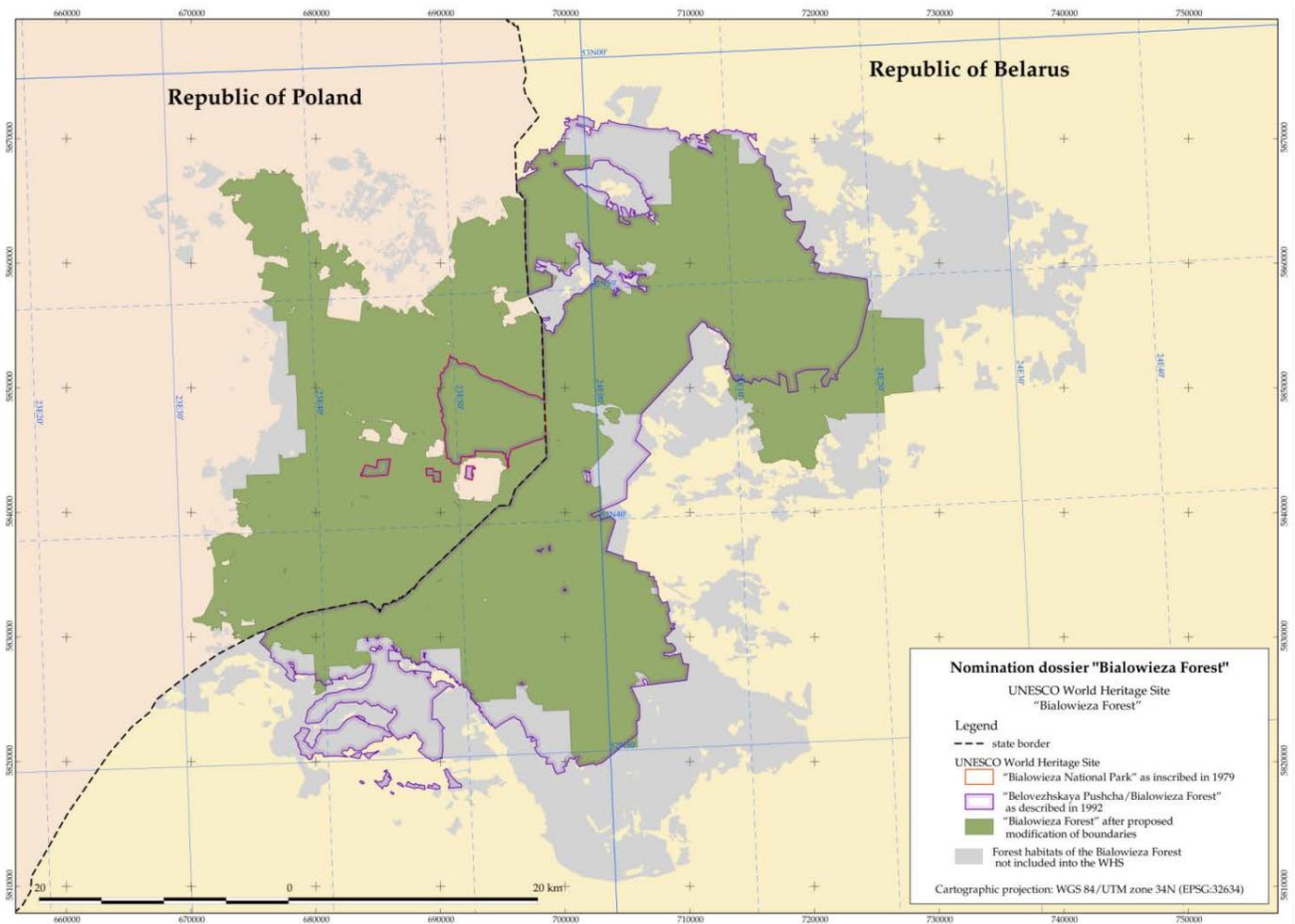
- a) establish as a matter of urgency the Transboundary Steering Committee that will coordinate, promote and facilitate the integrated management of the property;
- b) provide adequate human and financial resources to ensure the effective functioning of the Transboundary Steering Committee;
- c) expedite the preparation and further official adoption of the integrated management plan for the property addressing all key issues concerning the effective conservation and management of this transboundary property, particularly those concerning forest and wetlands management, and the need to increase functional ecological connectivity in the property, and to reduce the existing large network of roads and fire prevention corridors;
- d) ensure that this integrated management plan is adequately funded to ensure its effective implementation, and;
- e) maintain and enhance the level of cooperation and engagement of local communities that have been achieved during the preparation of this nomination as to ensure their contribution to the effective management of the property.

7. Further requests the States Parties to submit, by **1 February 2016**, a joint report, including a 1-page executive summary, on the state of conservation of the property, including confirmation of progress achieved on the above points, for examination by the World Heritage Committee at its 40<sup>th</sup> session in 2016.

**Map 1: Evolution of existing World Heritage site**



**Map 2: Proposed extension and buffer zone**



## **B. MIXED PROPERTIES**

### **B1. NEW NOMINATIONS OF MIXED PROPERTIES**



ASIA / PACIFIC

# TRANG AN LANDSCAPE COMPLEX

VIET NAM





# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## TRANG AN LANDSCAPE COMPLEX (VIET NAM) – ID No. 1438

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** To defer the nomination.

**Key paragraphs of Operational Guidelines:**

Paragraph 77: Nominated property has potential to meet World Heritage criteria.

Paragraph 78: Nominated property does not meet integrity or protection and management requirements.

### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 20 March 2013

**b) Additional information officially requested from and provided by the State Party:** None requested, but following the technical evaluation mission the State Party wrote on 14 October, 2013 advising of amendments to the property's buffer zone. The buffer zone was reduced in area from 6,268 ha to 6,079.6 ha thereby excluding areas in the south of the buffer zone which were subject to cement production and limestone quarrying licenses. The State Party on 26 February 2014 has subsequently provided additional information on a 'voluntary basis' concerning the management of tourism and quarrying/cement production impacts as well as additional information on protection and management.

**c) Additional literature consulted:** Various sources, including Doi, N.G., Tuan, N.A. and Dang, L.H. (2012) '**Palaeoenvironmental Conditions and Human Adaptation in Trang An**', *Vietnam Archaeology*, Number 7, Vietnam Academy of Social Sciences, Institute of Archaeology, Hanoi. Huong, N.M. and Tuan, N.A. (2012) '**Faunal and Floral Remains from Archaeological Sites in Trang An Area**', *Vietnam Archaeology*, Number 7, Vietnam Academy of Social Sciences, Institute of Archaeology, Hanoi. Huu, N.D., Truong, D.N., Huong, D.T., Thuy, T.T. and Hien, N.V. (2013) '**Stratigraphy of Triassic Sediments in the Trang An Area (Ninh Binh)**', *Journal of Geology, Series B, No 336/2013*, pp 23-35, Hanoi. Rabett, R.J. (2013) '**The Early Human Occupation of Trang An, Vietnam: Archaeological and Paleo-Environmental Evidence**', *Journal of Geology, Series B, No 336/2013*, pp1-7, Hanoi. Su, N.K. (2012) '**Trang An Cave Archaeology Outstanding Cultural and Historical Values**', *Vietnam Archaeology*, Number 7, Vietnam Academy of Social Sciences, Institute of Archaeology, Hanoi. Su, N.K. (2013) '**Cave Archaeology of Trang An The Outstanding Culture-Historical Values**', *Journal of Geology, Series B, No 336/2013*, pp66-81, Hanoi. Thang, D.V., Trung, N.D. and Thuy, T.T. (2013) '**Geomorphological Character and Aesthetic and Heritage Values of Karst Caves in Trang An (Ninh Binh)**', *Journal of Geology, Series B, No 336/2013*, pp82-93, Hanoi. Tuy, P.K., Van, T.T., Trung, N.D. and Dat, N.P. (2013) '**Geomorphology and Outstanding**

**Landscape Values of Trang An (Ninh Binh)**', *Journal of Geology, Series B, No 336/2013*, pp36-49, Hanoi. Tuyet, D., Trung, N.D., Huu, N.G., Ngoc, D., Dung, D.T., Thuan, T.M. and Thuy, T.T. (2013) '**The Geological and Tectonic Character of Trang An, Ninh, Binh**', *Journal of Geology, Series B, No 336/2013*, pp8-22, Hanoi. Tuyet, D., Dung, D.T., Thuan, T.M. and Thuy, T.T. (2013) '**The Outstanding Universal Values of the Trang An Landscape Complex (Ninh, Binh)**', *Journal of Geology, Series B, No 336/2013*, pp94-102, Hanoi. Van, T.T. (2012) '**Draft Statement of Outstanding Universal Values for Trang An Scenic Complex**', *Vietnam Archaeology*, Number 7, Vietnam Academy of Social Sciences, Institute of Archaeology, Hanoi. Van, T.T., Trung, N.D., Ha, V.V. and Thuy, T.T. (2013) '**Changing Sea Levels and the Occupation by Prehistoric People of Karst Valleys in the Trang An Landscape Complex, Ninh Binh**', *Journal of Geology, Series B, No 336/2013*, pp50-65, Hanoi. Williams, P. (2008) '**World Heritage Caves and Karst**', International Union for the Conservation of Nature, 28 Rue Mauverney, Gland.

**d) Consultations:** 7 desk reviews received. The mission also met with the Vice Chairman of Ninh Binh Peoples Committee; the Ministry of Culture, Sport and Tourism; representatives from the Vietnam Academy of Social Sciences, Institute of Archaeology; the Director of Trang An Management Board; the Head of International Cooperation, Trang An Management Board; the Secretary General of Vietnam National Commission for UNESCO; a range of expert consultants; the General Director of Xuan Truong Building Business; the Director and Head of Department Tectonic Geomorphology, Vietnam Institute of Geosciences and Mineral Resources; and many other stakeholders.

**e) Field Visit:** Graeme Worboys with Christophe Sand (ICOMOS), 11-18 August 2013

**f) Date of IUCN approval of this report:** March 2014

### 2. SUMMARY OF NATURAL VALUES

The Trang An Landscape Complex (referred to as Trang An in this document) is located within the Socialist Republic of Vietnam some 90 km southeast of Hanoi.

The 6,172 ha nominated property is entirely within Ninh Binh Province. Some 14,000 residents live within the nominated area. The nominated property is encircled by a buffer zone of nearly 6,079.6 ha with some 21,000 residents. Trang An has been nominated as a mixed cultural and natural property and comprises three formally protected areas being the Hoa Lu Ancient Capital; the Trang An-Coc-Bich Dong Scenic Area; and the Hoa Lu Special-Use Primary Forest, as well as other lands which are protected by decree, however, not formally designated.

The landscape complex is the product of deep dissection of relatively pure Lower Triassic limestone (the Dong Giao Formation) that was originally deposited in shallow seas. The karst mountainous area extends in a northwest-southeast direction and includes karst towers rising to 187 metres to the north west, to 198 metres at Trang An and up to 162 metres to the south. The general concordance of peaks between 150 metres and 200 metres reflects the latest tectonic planation phase prior to uplift about 5 million years ago. The tower and karst landscape has been formed in a humid - tropical environment with an average 2000 mm of rain per annum.

Trang An, as part of its erosional sequence, includes a diverse suite of classic positive karst landforms including cones, towers, and ridges together with negative landforms that include depressions (cockpits), interconnected depressions (poljes), and linear valleys. It also includes rockfalls subterranean caverns, speleothems, subterranean rivers, and lakes. A chequerboard pattern of cross-faulting has facilitated the remarkable development of cockpit landforms, some at the erosional base, while others have been raised differentially and are often associated with elevated foot caves or fossil foot caves. Many of these caves have provided shelters used by humans for 32,000 years. Morphological forms known as marine corrosion notches and swamp corrosion notches are found in the Trang An karst environment and provide important evidence for the nature of changing sea levels and tectonic activity. Trang An very clearly illustrates the interaction of karst evolution with changing sea-levels and associated water-table levels.

The geology and geomorphology of Trang An provides an exemplary display of the end stages of tower karst evolution in a humid tropical environment. Geological processes of dissolution, faulting, collapse, runoff and karstification have occurred and are still current. Trang An displays with remarkable clarity the evolutionary development of fengcong karst (where conical hills are separated by intervening cockpits and are interconnected by sharp ridges and saddles) and fenglin karst (where isolated steep sided karst towers stand on an alluvium mantled corrosion plain). The site includes a number of transitional karst features which illustrate this evolution. The fengcong peak-cluster-closed depressions are considered the youngest stage of karst development in the massif, while the oldest are the

isolated towers. According to several reviewers, this fengcong to fenglin geomorphic sequence is a text book example and the best of its kind in the world. The fengcong enclosed depressions (cockpit) landscapes and their associated footcaves are also considered by experts to be the best example of their kind in the world.

A number of cave occupation sites have established an in-situ record of human-environment interaction in the karst landscape that spans from 32,000 BP to the Recent, which forms part of the cultural value of the property and will be evaluated by ICOMOS. The site demonstrates an interaction between people and the recent geological evolution of the landscape as it shifted between continental, insular and coastal settings.

Scenically the nominated property is visually and morphologically spectacular with a diversity of fengcong formations that are up to 198m high sited within a landscape of rainforest and shrub encrusted cone-shaped rock towers, sharp interconnected ridges, saddles, high walls, perched caves, sheer cockpit walls and downslope cascading rock falls. Each karst cockpit is a fortress-wall-surround that stands above the flat, water rich depression floor. Unlike other non-karstic terrain, there is neither an obvious entrance nor exit to the cockpits, nor always a linear valley floor to follow, just containment walls. Access to each cockpit is discrete and achieved via Trang An's subterranean footcave system. Coupled with the natural scenic values is a mix of human landscapes such as colourful paddy fields which add to what the nomination notes as a three dimensional landscape. The rugged, vertical karst features are essentially natural, but the downstream valley bottom lands are human modified agricultural lands.

### 3. COMPARISONS WITH OTHER AREAS

IUCN has considered the natural values of the property, whilst evaluation of the cultural values will be considered by ICOMOS. The nomination includes a global comparative analysis which is comprehensive and clear, and which IUCN has considered carefully with the benefit of a range of inputs from expert reviewers. The analysis is well-argued and with respect to karst values it strongly references the 2008 IUCN Thematic Study on Caves and Karst. Trang An was compared with a number of existing World Heritage properties inscribed under criterion (vii) for their outstanding karst and scenic values. The analysis assesses World Heritage properties with different karst types in different climatic conditions to assess Trang An's relative values against six of the most comparable World Heritage properties within humid tropical settings. IUCN notes that the nomination argues that the outstanding beauty of the tower karst landscape, its landscape diversity and aesthetics relate to the mix of natural waterways, caverns and human occupation. As such a combination of natural and manmade features has been taken into account which is inconsistent with the interpretation of natural values within criterion (vii)

under the Operational Guidelines. Nevertheless the Trang An Landscape Complex contains a relatively undisturbed “core area” of superlative natural phenomena *and* of exceptional natural beauty and aesthetic importance. This exceptional geomorphology, scenery and natural beauty is quite confined in its total area. It is an outstanding fengcong landscape of karst towers, connecting ridgelines and circular and rainforest and vegetation encrusted, steep-walled cockpit terrain. It is natural and self-protecting, and experience of this area is by emergence from subterranean passages to awe-inspiring karstic landscapes. The high quality fengcong landscape and its associated cockpit and foot cave system is part of the Trang An-Tam Coc-Bich Dong Scenic area and part of the Hoa Lu Special-Use Forest. IUCN notes that immediately outside of this very special core area, modifications to the integrity of the natural landscape and human land use patterns detract from the naturalness of a larger area that may have otherwise have been suitable for inclusion in the nomination.

The assessment of Trang An’s relative values under criterion (viii) is informed by an expert comparative analysis completed by internationally renowned karst specialists in October 2013. This analysis updates the 2008 IUCN Karst Study and assesses the nominated property against 77 other karst areas. Key findings include that Trang An is most comparable to Ha Long Bay in Viet Nam (noting the latter is a drowned karst system) and to the Lijiang River karst area of Guilin in China (included within China’s nomination of the South China Karst Phase II). The analysis finds that, of seven properties inscribed on the World Heritage list for karst values in a humid tropical sub-tropical context, Trang An is the only one with totally autogenic (rainfed) karst, in part due to its small size; Trang An’s compactness provides a relatively uncomplicated, readily visible and comprehensible model of karst evolution; and Trang An has almost certainly the world’s clearest demonstration in the landscape of the final stages of the humid tropical karst geomorphic cycle as it progresses from cone karst to tower karst to base leveled corrosion plain (i.e. from maturity to old age). The Ha Long Bay World Heritage site is part of the same limestone karst system as the nominated property and indeed sits within the overall South China Karst system. Trang An’s past history of sea level fluctuations means it would have resembled Ha Long Bay during former times of inundation. In a sense Trang An completes the erosional sequence of karst which is evident in the South China Karst serial property which is currently subject to a proposed extension by the State Party of China.

The 2013 comparative analysis concludes that *“Trang An can be regarded as a ‘bijou’ site: a relatively small but exquisite geological property that displays more clearly than any other on the World Heritage List the end stages of karst landscape evolution near sea level in a humid tropical environment. Adding to that quality is the excellent condition of the natural forest that clothes the landscape, which ensures that the natural processes operating in the karst can continue unimpeded for the*

*foreseeable future. It is a superb model of its kind and outstanding at a global scale. Its exquisite beauty, which clearly qualifies as being of outstanding universal value, is a bonus”.*

The complexity of the area gives rise to a variety of geomorphic forms present. This complexity also underpins appreciation of the outstanding scenery [(criterion (vii))] and has created the landscape that has been subject to cultural uses.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

All land within the nominated property is owned by the Socialist Republic of Viet Nam and is controlled by the Ninh Binh Provincial People’s Committee. The Trang An Landscape Complex comprises three areas that receive specific formal protection from the Government. These are the Hoa Lu Ancient Capital, which was inscribed as National Heritage in 1962 and inscribed on the list of Special National Heritage Sites in 2012. The joint Trang-An – Tam Coc-Bich Dong Scenic Area was also inscribed on the list of Special National Heritage at this time. The third area, the Hoa Lu Special Use Forest receives protection from the Ninh Binh Provincial People’s Committee.

Protection for the Trang An – Tam Coc-Bich Dong Scenic Area is achieved through the Law on Cultural Heritage 2001 and the Law on Forest Protection and Development 2004. Protection of the Hoa Lu Special-Use Primary Forest is through the Forest Law alone. The Forest Law identifies specific, prohibited activities; however, the regulations under the law provide for certain ecotourism developments provided they do not impact on biodiversity. IUCN notes that whilst the nominated area is protected, the laws still provide opportunities for what is described as sustainable tourism development. These opportunities could be a threat to the Outstanding Universal Values and guidance for how tourism infrastructure and services will be managed through management planning frameworks and regulations remains unclear.

Several areas within the nominated boundary are not included within these three designated areas (above) but are protected through national decrees consistent with the legal mandate given to the Trang An Landscape Complex Management Board on its establishment in 2012.

A 70 year lease has been provided by the Ninh Binh Provincial People’s Committee over the 3,000 hectare Trang An – Tam Coc – Bich Dong Scenic Landscape within the nominated property. The lease has been awarded to a private business, the Xuan Truong Enterprise, and is for the management of protection, conservation, tourist and promotional activities. More specifically the lease delegates the management of the

tourism services to this private sector company. A number of other private tourist resort operations exist within the nominated property. Lessees are subject to the objectives and regulations of the property Management Plan.

IUCN has concerns relating to the latitude afforded by current laws in permitting tourism and other infrastructure development as well as the protection status of areas outside of formally designated protected areas. IUCN therefore considers that the legal protection status of the nominated property does not meet the requirements of the Operational Guidelines.

## 4.2 Boundaries

All of the key elements of a fengcong and fenglin Karst landscape are present within the nominated property and the natural processes of Karst development are on-going. However, whilst the nominated property (6,172 ha) is of sufficient size to include all of the values that underpin World Heritage criteria (vii) and (viii), the boundary as selected is not the most appropriate in relation to natural criteria. From the perspective of criteria (vii) and (viii), the nominated boundary for the World Heritage property includes significant areas of development and human impact that detract from a case for natural values. For example the eastern boundary encompasses new road developments, tunnel developments, tourism development and a major car park at Trang An; major paddy field infill works that provide for re-settlement housing developments; major areas for cultural landscaping (not restoration); and, urban village development. Similar inappropriate commercial, rural lands and villages are included within the southern and northern boundaries. IUCN notes that the boundaries will need consideration in relation also to considerations of cultural value, as evaluated by ICOMOS.

A buffer zone surrounds the nominated property. IUCN supports the adjustments to the buffer zone boundary made to exclude several cement and limestone quarrying license areas. The buffer zone includes a mix of agricultural lands, villages, roads, utilities and some natural lands. Some 21,000 people live within this area. Planning emphasis aims to control impactful development, however, this will be very challenging given the potential for tourism related developments and urbanization within areas surrounding the nominated property.

IUCN has concerns regarding the configuration of the nomination boundary, which includes inappropriate areas for listing. IUCN therefore considers that the boundaries of the nominated property do not meet the requirements of the Operational Guidelines for a listing under natural criteria.

## 4.3 Management

The Trang An Landscape Complex has a Management Plan. A Master Plan for the Hoa Lu Ancient Capital also exists and the nomination document identifies that a Master Plan will be developed for the entire nominated area consistent with legislation. The State Party advises in February 2014 that a draft tourism management plan is in preparation. The State Party further advises that the (overview) “Management Plan” for the nominated property has been prepared consistent with UNESCO requirements, while the (more detailed) “Master Plan” has yet to be developed. The 2013 Management Plan has been prepared to strictly implement the spirit of the World Heritage Convention. It will be revised every five years. The Plan identifies a clear purpose, it reinforces the importance of protecting the Outstanding Universal Value; it establishes clear objectives of management; identifies threats and introduces management zoning and actions to help protect the Outstanding Universal Value.

The Management Plan provides a “management zoning plan” which identifies five zones which are cross-cutting to the protection tenures of the property. IUCN notes a number of inaccuracies in the zoning system principally that the mapped zones do not match the on-ground reality. Land use and activities are at odds with the zoning system, for example areas delineated as Tourism Development Zones were permitting developments in addition to tourism infrastructure including landscaping and residential housing development.

The Trang An Landscape Complex Management Board was established in 2012 by the Ninh Binh Provincial People’s Committee specifically to manage the nominated Landscape Complex and the buffer zone. The Board is legally mandated and co-ordinates the participation of the Ministries of Government, the National Commission for UNESCO, the National Council of Cultural Heritage, Research Institutes, City and District Authorities, Peoples Committee of Communes and the Xuong Trong Enterprise (and other Companies). The functions, accountability and strategic direction of the Board could be improved further to help protect the nominated property. There is no adequate vision statement for the protection of the possible outstanding universal value of Trang An, nor is there a specific Board mandate for the on-ground protection, conservation and restoration management which operates beyond general obligations to implement the Master Plan. As noted elsewhere tourism management is largely delegated through commercial leases.

The Board aspires for enhanced capacity. It has five departments with 57 staff and there are proposals to increase this staff number to 71. An additional 7 rangers manage the Hoa Lu Special Use Forest. Tourism management for the Trang An – Tam Coc-Bich Dong area is delegated to the Xuan Truong Enterprise and for its Trang An site. Lessee staffing is therefore supplemented by 5 ticket office staff, 11 business team

staff, 15 guards/rangers (for property security safety and maintenance) and 1,500 tourist boat operators that have been recruited locally.

The average budget for the Trang An Management Complex Board is equivalent to c.500,000 USD per annum and this is considered adequate. The Board, in recent years, has received the benefit of major capital investment funding in the order of c.7 million USD, but this high budget allocation period is coming to an end. Tourism revenue is also received from ticket sales.

Several other concerns have been identified with respect to management planning. These include the need to reinforce that the protection of the nominated property must have primacy in considering any permissible activities and developments. Linked to this is the need to revise the list of permissible activities within the nominated property as many are inappropriate such as road, utilities and infrastructure developments. There is also a need to reinforce the accountabilities for tourism lessees with respect to the protection of features of possible outstanding universal value. Timetables should be specified for the enactment of regulations to control infrastructure development and urbanization in and around the nominated property, and for the preparation of the tourism plan. IUCN also considers greater clarity is required regarding the relationship between the various planning instruments in effect for the nominated property.

In summary, IUCN has a series of concerns regarding management planning and believes the significant threat posed by tourism growth warrants the urgent preparation and completion of the tourism plan. IUCN therefore considers that the management of the property does not meet the requirements of the Operational Guidelines.

#### 4.4 Community

The governance arrangements for the Trang An Landscape Complex are thorough and include all levels from the community to the highest levels of Government. Input to the management of the Landscape Complex is through local communes, the recently established Board and the Ninh Binh Provincial People's Committee. Opportunities for input include the development of the Management Plan and its revision every five years. Local people were involved in the development of the Management Plan for the Landscape Complex.

A survey of 500 households in the nominated property and the buffer zone identified that 90% of people surveyed were informed and supportive of the World Heritage nomination. A public meeting dealing with the World Heritage nomination at the Trang An Visitor Centre provided opportunities for comment by the more than 200 participants from the local area. All comments raised were supportive of World Heritage for the nominated property. Most comments focused on the benefits of enhanced tourism that would be linked to World Heritage status. The State Party has undertaken a

programme of community consultation on the World Heritage nomination. There is recognition that more work is needed to broaden the awareness of heritage conservation among local people and a major educational program is planned.

The land is owned by the Socialist Republic of Viet Nam and is controlled by the Ninh Binh Provincial People's Committee. People live within the landscape complex, they undertake agriculture that includes growing rice, raising livestock (ducks) and fishing. Many locals are directly involved in the nominated property as boat owners and operators, maintenance workers, security workers and many derive income by providing accommodation, supplying food and selling handicrafts. Traditional festivals and cultural events are encouraged within the property.

#### 4.5 Threats

The remaining core natural area of the nominated property is still in a substantially natural condition. There have been considerable changes to other areas of the nominated property from highway development, village development, landscaping developments, car park construction, tourism developments and the presence of communication infrastructure and utilities. Agriculture dominates large parts of the property. Restoration of some disturbed areas is considered possible.

The greatest threat to the nominated property is from inadequately planned and managed tourism along with its associated infrastructure support and service provision developments. Over a million visitors visited Trang An in 2011 and 30% of these were international visitors. An estimated 5,000 people work in the tourism industry, and seasonally, there is an additional 5,000. IUCN was informed that an estimated \$US 7.1 million in tourism revenue is generated annually. The target growth for tourism in 2020 is for 2 million visitors. For the entire nominated property, there are a total of 2,600 tourism boats solely operated by local communities, with 1,500 at Trang An, 1,000 at Tam Coc, 50 at Bich Dong and 50 at the Milky Way Grotto.

New tourism infrastructure and associated developments observed leading from Ninh Binh City and to the Trang An Landscape Complex reflect that tourism is a key economic driver for the local area. Some of these changes have included a new dual highway; a major gateway; a landscaped highway route; the landscaping-infilling of paddy fields; a new high quality tourism Visitor Centre and an associated large car park. However, as noted above, the lack of a tourism plan leaves the property vulnerable to overuse and inappropriate development potentially jeopardizing values. The completion of the plan (that helps protect the Outstanding Universal Value) prior to consideration of World Heritage inscription is considered essential. The Plan would be directly linked to the protection of the Outstanding Universal Value as its primary objective, and its governance requirements would guarantee its

authority and primacy for protection of the property. Without these safeguards there is a possibility that premature World Heritage listing could add to unsustainable pressures. IUCN welcomes the State Party advice of February 2014 that a draft tourism management plan is in preparation. Addressing the control and limitation of tourism within a sustainable maximum number, and with a priority for conservation, is considered a pre-requisite before inscription on the World Heritage List could be considered.

Limestone quarrying for cement or for ornamental sculptures is a local industry based on the local high quality Lower Triassic limestone karst exposures. Quarry areas have been excluded from the nominated property and the buffer zone boundary has recently been amended to ensure any possibility of quarrying in the buffer zone is also excluded, although it appears very minor quarrying may take place within the Prison Complex within the buffer zone. The State Party has advised of a series of measures to minimise the impacts of limestone quarrying and cement production in the south of the Trang An Landscape Complex buffer zone.

Four rivers surround the proposed property with the Hoang Long River to the north, Chanh River to the east, He River to the south and the Ben Dang River to the south. Any possibility of external water-based pollution through an interconnected system of foot caves is removed or minimized due to the net positive outflow of water from the proposed property. Three rivers, the Sao Khe, the Ngo Dong and the Den Voi flow out from the Trang An Landscape complex.

Active dredging work is undertaken within the nominated property for maintenance purposes. Advice has been provided that this does not impact the natural water flow regimes, water quality or water levels. Given this dredging may occur across the nominated property and that it may impact the Outstanding Universal Value, dredging actions need to be the subject of a detailed Environmental Impact Assessment.

The Management Plan for the Landscape complex recognizes opportunities for growth in villages, for the immediate resettlement of people within the nominated area and a future that includes the expansion of urban areas within the proposed property. An agricultural landscape of paddy fields and rural dwellings provides an aesthetic landscape foreground which is sympathetic to the dramatic and precipitous fengcong and fenglin landscape elements; however an urbanized landscape is considered a threat to these landscapes. New tourism developments are also considered a threat to these rural and natural values.

Extensive infilling of paddy fields and ornamental landscaping work is being undertaken in the vicinity of the new Trang An Visitor Centre and especially between the Ninh Binh City and Trang An. It is indicated that this transformed area will be used for resettlement of people

displaced from elsewhere within the property and will be urbanized.

Two introduced animal species were identified by the nomination report: one a snail, the other being semi-wild goats. Natural karst evolutionary processes are dependent on the local natural ecosystems and natural processes and the impact of any introduced species needs to be clearly understood and appropriate action taken to minimize any threats to the Outstanding Universal Value. Domestic goats in particular are considered to be a threat to natural processes on the nominated property including the threatened *Chinese Seral*.

In conclusion, for the reasons outlined above, IUCN considers that the integrity, protection and management of the property do not meet the requirements of the Operational Guidelines.

## 5. ADDITIONAL COMMENTS

### 5.1 Consideration in relation to serial properties

Trang An has not previously been nominated, however it is part of the South China Karst geo-tectonic region which extends beyond China. It is therefore worth recalling the IUCN evaluation of South China Karst Phase 1 (2007) which noted that *“One area of reservation in relation to the current selection of properties across the three anticipated phases of the nomination is that the South China Karst region extends into Viet Nam, and that the significant karst landscape in North Viet Nam is coterminous with the Guangxi Karst. The State Party of China has confirmed its willingness to work with Viet Nam to examine possible transnational cooperation.”* IUCN recommended that the State Party of China consider transnational aspects with Viet Nam in any subsequent phases of nomination. Although not nominated as a transnational part of the South China Karst serial property, the Trang An Landscape Complex should be considered in this context.

Given there is already an ongoing process of extension of the South China Karst World Heritage Site in China, it appears to be difficult to insist on Trang An being directly connected to that process, however it would seem appropriate for links to be made as far as possible. What appears to be more appropriate to recommend is that Viet Nam might consider a parallel process to the Chinese South China Karst nomination, where a number of key karst sites have been nominated as part of a coordinated process, in a national serial approach. Noting that a key comparison for Trang An is the site of Ha Long Bay, the relationships to Ha Long Bay and the adjoining Cat Ba Archipelago would seem to warrant further consideration, notwithstanding the challenges of Trang An being nominated as a mixed site.

## 6. APPLICATION OF CRITERIA

**Trang An Landscape Complex** has been nominated under natural criteria (vii) and (viii), as well as under cultural criteria which will be evaluated by ICOMOS.

### **Criterion (vii): Superlative natural phenomenon or natural beauty and aesthetic importance**

Trang An incorporates a footcave-enclosed depression (cockpit) landscape that is considered by experts to be the best example of its kind in the world. The nominated property encompasses a visually spectacular landscape with its enclosed cockpit depressions, and their vertical, high walls, rising to over 150m, cliffs, rockfalls, karst cones and karst towers. The human response to this landscape is multi-sensory, heightened by the aesthetics of colour of the enclosed depressions contrasted with dark green tropical rainforests, grey-white exposed limestone rocks and cliffs, darker brown coloured cockpit waters and the brilliant blue of the sky. Travelling in four-person sampan boats, visitors to the site experience the visual impact of an “arrival” at individual enclosed depressions accessed through the natural cave systems that connect the cockpits. This footcave boat experience stimulates the senses through the daylight to dark transition beyond a cave entrance; narrow dark passages with low ceilings, speleothems and cave formation features; moving water and the soft sounds of oar and water; and finally a return to bright daylight as the silhouette of a footcave exit is approached. At each exit, there is a heightened sense of anticipation as a new cockpit experience is unveiled.

The nominated property as presented includes inappropriate areas of development and human activity, and integrity, protection and management issues need to be address. However, a natural area of fengcong dominated Karst in the inner part of the nominated property is considered to have potential to meet criterion (vii).

IUCN concludes that the nominated property has potential to meet this criterion.

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

Trang An includes the range of karst solution evidence for the end point of karst evolution under a humid tropical environment including the fengcong features and isolated fenglin karst tower formations that are considered by experts to be the best evidence of their kind in the world. Trang An combines, within a small area, evidence of karst form, process, and primary and secondary controls. This includes fengcong and fenglin landforms of international significance, evidence of primary controls that influence their landform development processes such as structure and lithology; evidence of secondary controls such as fault crush zones and marine transgressions; evidence of the actual processes and landscapes in a natural condition that are contributing to on-going natural processes (such as the

rainforest environments and water tables within cockpits) and a variety of landforms as a consequence of these processes. The core natural area of the nominated property includes a range of outstanding fengcong karst solution landforms that includes enclosed depressions (cockpits), cones, towers, bell shaped towers, sharp ridges, saddles, fault influenced zigzag valleys, fault influenced linear valleys, karren, caves, foot caves, and boulder fields. The nominated area includes important variations of these landscape forms such as tectonically raised cockpits and evidence of sea level fluctuations. In addition Trang An reputedly includes the best developed set of footcaves known for the world.

The nominated property as presented includes inappropriate areas of development and human activity, and integrity, protection and management issues need to be address. However, a natural area of fengcong dominated karst in the inner part of the nominated property is considered to have potential to meet criterion (viii).

IUCN concludes that the nominated property has potential to meet this criterion.

## 7. RECOMMENDATIONS

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

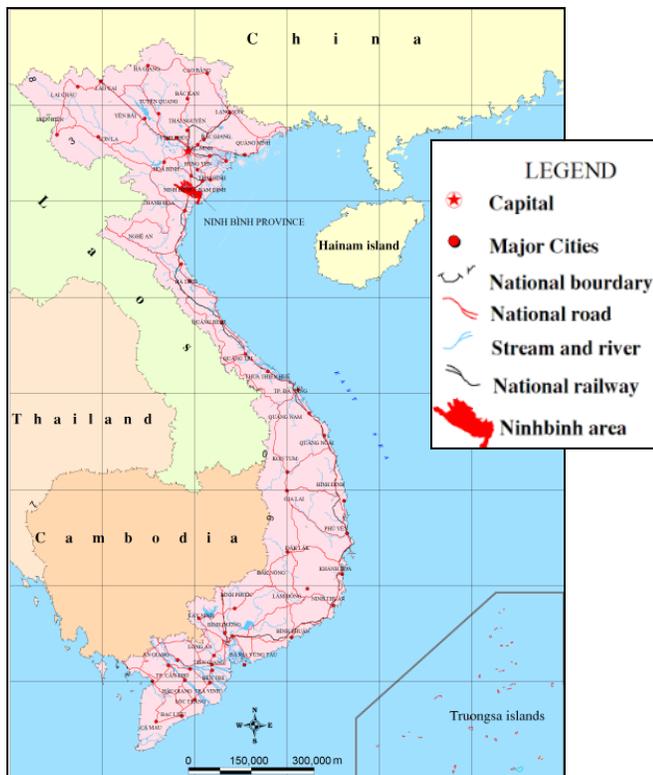
The World Heritage Committee,

1. Having examined Documents WHC-14/38.COM/8B and WHC-14/38.COM/INF.8B2;
2. Defers the nomination of the **Trang An Landscape Complex (Viet Nam)**, in relation to natural criteria, taking note of the potential for this property to meet criteria (vii) and (viii), in order to allow the State Party to:
  - a) prepare a revised World Heritage nomination with a boundary that better reflects the areas and attributes of possible Outstanding Universal Value and an appropriate surrounding buffer zone;
  - b) ensure adequate legal protection for the revised nomination including the designation of any areas within the property as protected areas;
  - c) prepare a revised and upgraded Management Plan and Zoning Plan, that recognises the Outstanding Universal Value of the property and ensures that the protection is aligned and integrated into provincial planning;
  - d) finalise, as part of the Management Plan, an effective, well enforced, and adequately resourced tourism management sub-plan specifying regulations that will ensure full protection of the natural features of the property, and that will establish daily, seasonal and annual limits to visitor numbers based on ecologically sustainable use criteria as well as a social carrying capacity based on quiet enjoyment of the property.

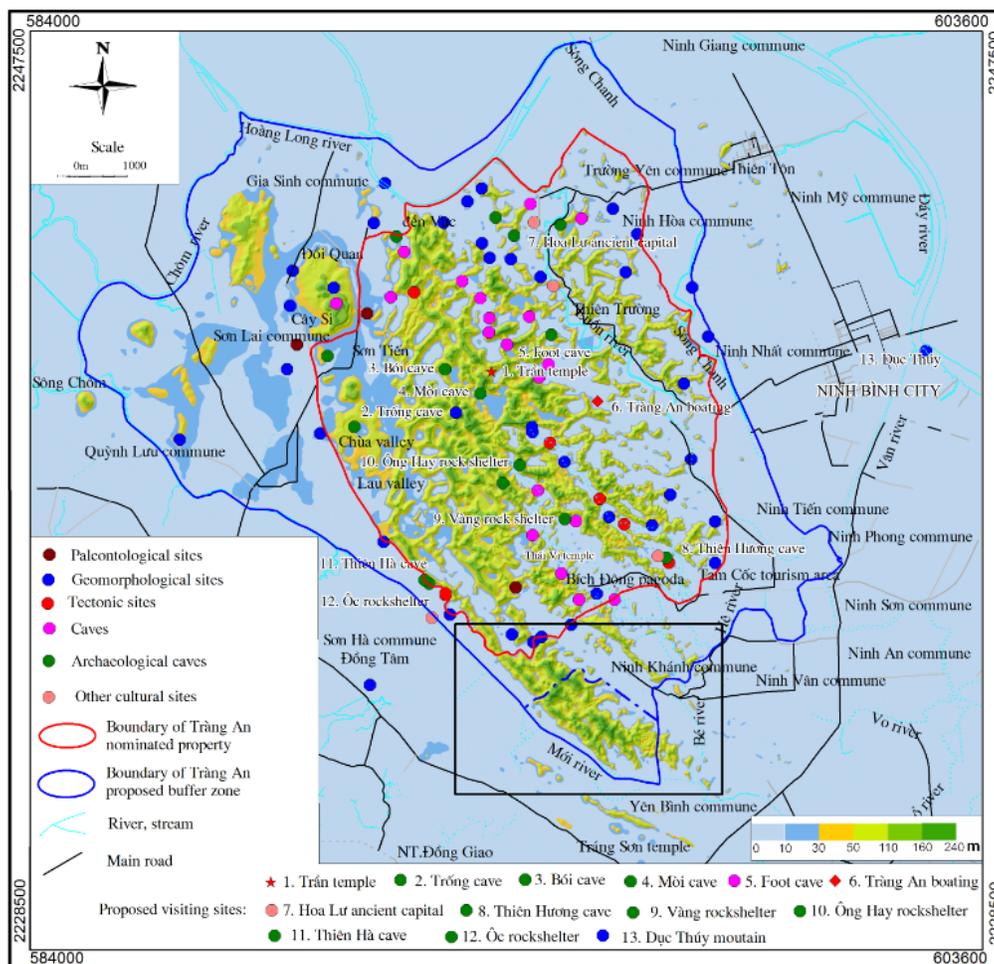
3. Commends the State Party, and the range of stakeholders in the nominated property for their commitment to the preparation of this nomination, and encourages the State Party to resubmit the nomination, with appropriate assistance from the Advisory Bodies, consistent with the Committee's requests for greater upstream support to nominations.

4. Encourages the State Party with the support of the UNESCO World Heritage Centre and Advisory Bodies to review its Tentative List of World Heritage properties to ensure the most appropriate properties are identified and brought forward for nomination, and that opportunities for serial sites and extensions are considered as options for future nominations.

Map 1: Nominated property location



Map 2: Nominated property and revised buffer zone





EUROPE / NORTH AMERICA

# ARRÁBIDA

PORTUGAL





## WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

### ARRÁBIDA (PORTUGAL) – ID 1454

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** Not to inscribe the property under natural criteria.

**Key paragraphs of Operational Guidelines:**

Paragraph 77: Nominated property does not meet relevant World Heritage criteria.

Paragraph 78: Nominated property does not meet integrity or protection and management requirements.

**Background note:** The *Serra da Arrábida Nature Park* was nominated in 1983 for its natural features (noting at that time criterion (iii) accommodated floral diversity and landscapes of high quality). The property nominated in 1983 was approximately 20,000 ha, an area similar to the current nomination's core and buffer zone. The IUCN evaluation report noted that Arrábida was “a unique area in the context of Portugal but that other areas in the Gibraltar and Sagres Peninsula were of greater botanical interest and that other more important areas for avifauna had also been suggested”. The evaluation went on to conclude that “The Serra da Arrábida Nature Park is important in the context of the region but does not display features of international significance. The nomination is not a strong one and does not present a convincing case for inclusion of the area on the World Heritage List.” In regard to the integrity of the site, the report mentions “various pressures that affect its integrity including rock quarrying and construction of holiday homes as well as heavy recreation pressures from nearby cities”.

It should also be noted that *Pedra da Mua Natural Monument*, located within the nominated area, was included in the 2009 serial nomination of *Dinosaur Ichnites of the Iberian Peninsula* submitted by Portugal and Spain as one of three components in Portugal. The property was nominated under criteria (vii) and (viii). IUCN's recommendation at the time was to not inscribe the property however the nomination was deferred by 34COM (2010).

## 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 20 March 2013

**b) Additional information officially requested from and provided by the State Party:** None requested

**c) Additional literature consulted:** Araujo, M.B. 1999. **Distribution patterns of biodiversity and the design of a representative reserve network in Portugal.** *Diversity and Distributions* (1999) 5, 151–163. BirdLife International. 2013. Available from [www.birdlife.org](http://www.birdlife.org). Critical Ecosystem Partnership Fund. 2010. **Ecosystem Profile. Mediterranean Biodiversity Hotspot. For submission to the CEPF Donor Council.** Prepared by Doga Dernegi on behalf of BirdLife International in collaboration with Association “Les Amis des Oiseaux,” BirdLife Global Secretariat, BirdLife International, Middle East Division, IUCN, Plantlife International, Royal Society for the Protection of Birds, Sociedad Española de Ornitología, Sociedade Portuguesa Para O Estudo Das Aves, The Cirrus Group, Tour du Valat. Cunha, A.; Erzini, K.; Serrão, E.; Gonçalves, E.; Borges, R.; Henriques, M.; Henriques, V.; Guerra, M.; Marbá, N.; Fonseca, M. 2011. **Restoration and Management of Biodiversity in the Marine Park Site Arrábida-Espichel** (PTCON0010). LIFE06 NAT/P/000192. BIOMARES. Final project report. Portinho da Arrábida, Portugal. Cuttelod, A.; Garcia, N.; Abdul Malak, D.; Temple, H.; Katariya, V. 2008. **The Mediterranean: A biodiversity hotspot under threat.** In: Vie, J.-C.; Hilton-

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**d) Consultations:** 5 desk reviews received. The mission met with the President of the AMRS Board (an association of the three local municipalities of Palmela, Setúbal and Sesimbra); the Director of the Department for Nature and Forestry Conservation (ICNB) of Lisbon and Tejo Valley; Mayors; archaeologists, geologists, professors and researchers; stakeholders of several tourism associations, NGOs and other associations.

**e) Field Visit:** Tilman Jaeger (with Ana Luengo Añón from ICOMOS), 1-4 October 2013

**f) Date of IUCN approval of this report:** March 2014

## 2. SUMMARY OF NATURAL VALUES

Arrábida is the name of a small limestone mountain range (*Serra da Arrábida*) reaching some 500 m.a.s.l. and also the name of the adjacent sea (Arrábida Sea) in and around the southern part of Portugal's Setúbal Peninsula. The peninsula reaches into the Atlantic Ocean just west of the city of Setúbal and south of Portugal's capital Lisbon. Given the location on a peninsula reaching its limit at Cape Espichel, Arrábida can reasonably be regarded as part of a distinct landscape unit.

Nominated as a mixed property and a cultural landscape, Arrábida has a longstanding human history which is reflected in numerous archaeological sites and features and which have shaped the entire landscape to this day. The contemporary coastal landscape is comprised of a mosaic of orchards, vineyards, pastures

dotted with historic military and religious architecture, small settlements, farm houses and vacation homes. In particular, near the coast and in more rugged terrain there are areas and patches of (secondary) natural vegetation, such as remnants of Mediterranean forests and scrubland, oak woodland and gorse-heath interspersed with small patches of planted *Pinus* and *Eucalyptus*. The diverse coastline includes sandy and rocky beaches, as well as abrupt limestone cliffs.

The nominated area totals 12,750 contiguous hectares of land and sea with several distinct terrestrial and marine buffer zones totaling 7,547 ha. For the most terrestrial part it coincides with Arrábida Natural Park (*Parque Natural da Serra da Arrábida*) but is not identical to it in surface area. According to the World Database on Protected Areas (WDPA) the natural park falls under IUCN Protected Area Management Category V. There are overlapping layers of formal conservation status and recognition under the EU regulation (Natura 2000) and small areas within the nominated area are formally protected as cultural or natural monuments. The marine part, the Professor Luiz Saldanha Marine Park established in 1998, is noteworthy for being the first marine protected area (MPA) in Portugal.

The contrast of smoothly undulating lines of relief abruptly meeting the sea in the form of cliffs is visually impressive, as noted by writers and artists and appreciated by the many contemporary visitors. There are numerous beautiful views of the Atlantic, the rugged coast and the land use mosaic of a longstanding cultural landscape. Geologically speaking, the nominated area is noteworthy for a number of reasons, namely for (a) its scientific importance; (b) the occurrence of Arrábida Breccia, a rare and highly valued lithological (rock) type; (c) its karst phenomena, and (d) the small *Pedra da Mua* Natural Monument with its important fossil deposits and dinosaur footprints.

Ecologically and in terms of biodiversity richness, both the overall setting and the diverse array of terrestrial and marine habitats are of considerable conservation importance. Arrábida is located between the large estuaries of the Sado and Tagus (Tejo) Rivers. Both host important conservation values despite major human pressures, including urban encroachment and water pollution. Adding to the landscape and habitat diversity is the convergence of Mediterranean and Atlantic climatic influences with very distinct microclimates according to exposure and elevation. The landscape diversity also continues to be shaped by mostly small-scale agriculture resulting in many human-made ecotones and niches.

In terms of terrestrial species, vertebrates are well represented with a reported total of 34 mammals, some 200 resident and migratory birds, 17 reptiles and 12 amphibians. There are a few noteworthy raptor nesting sites and the peninsula and its marine surroundings are also known to be an important stepping stone in one of the major bird migration routes. Some of the caves host important breeding colonies of bats and highly

specialized arthropods, including an endemic species of spider. Arrábida is rich in arthropods, boasting for example a remarkable species diversity of spiders, beetles and butterflies. Several beetle species are endemic to Portugal with one species being locally endemic. One land snail is also locally endemic to the site.

Arrábida has a high floral diversity featuring Atlantic and Mediterranean elements with Macaronesian floristic elements in the coastal cliffs. According to the nomination dossier, a total of 1,368 taxa within 111 families have been recorded, including the two local endemic species noted above. There are noteworthy remnants of Mediterranean forest with small stands of uncommon tree-sized Kermes Oak, believed by some scientists to be a distinct species. The patchwork of the cultural landscape encompasses highly interesting succession dynamics, including stages of natural regeneration after a large-scale fire event in 2004.

The diverse coastline and marine areas are mostly situated within the Bay of Sesimbra, and include both exposed and rare sheltered areas. Just like the land, the marine area is marked by a convergence of distinct biogeographic elements. These stem from Northern Africa coastal waters, the Mediterranean and cooler parts of the Atlantic further west and north. The near-shore underwater topography is shaped by the eroding limestone cliffs, contributing to underwater habitat diversity. Marine species records are impressive across numerous taxonomic groups and recent studies appear to indicate a quick recovery of marine biodiversity from past impacts reportedly due to conservation efforts.

### 3. COMPARISONS WITH OTHER AREAS

The property is nominated as a mixed property under cultural criteria (iv) and (vi) as well as all four natural criteria [(vii), (viii), (ix) and (x)]. The cultural criteria will be evaluated by ICOMOS. With the possible exception of criterion (viii), the nomination dossier includes a relatively superficial global comparative analysis wherein Arrábida is compared to some 11 other World Heritage sites, mostly in Europe and North Africa. The attributes of these sites are described with comparison limited to the macro scale land and seascape level. Little comparative data is provided on biodiversity.

Criterion (vii) encompasses two dimensions: "natural beauty" and globally "superlative" phenomena. The case made by the State Party is primarily based on landscape beauty as no plausible claim is made in terms of possible global "superlatives". The meeting of the hilly landscape and the sea along a diverse coastline featuring beaches and distinctive cliffs on a peninsula makes the area a visually attractive discrete landscape unit. The aesthetic quality of Arrábida is recognized in art and literature and can be appreciated from numerous viewpoints. The nominated area is no doubt a beautiful place of local and national importance. A case for

significance within Portugal can easily be made, and perhaps be extended to the Iberian Peninsula or even (parts of) Europe. However, IUCN notes that the site is relatively small in size and possesses a comparatively low degree of naturalness with irreparable damage to the visual integrity through limestone quarrying. The combination of these factors clearly compares unfavourably with many (protected) coastal settings in the world, including numerous inscribed World Heritage properties. Arrábida clearly lacks the grandeur of many coastal protected areas and/or settings in terms of scale, remoteness, intactness and visual integrity. This view is supported by several expert reviewers who note that no superlative natural phenomena have been identified within the area.

The nomination dossier contains a disproportionately exhaustive section on criterion (viii) which, while a good synthesis of available scientific information, does not make the case for Arrábida's earth science values on a global scale. The section combines a number of diverse claims to make a case for World Heritage. IUCN is of the view that Arrábida's karst values do not compare favourably with other World Heritage properties inscribed for their cave and karst attributes. Though there are many interesting caves, including the notable *Gruta do Frade*, even a superficial comparative analysis illustrates that several existing World Heritage properties harbour karst values of an entirely different order of magnitude. This conclusion is well supported by the corresponding 2008 IUCN Thematic Study on Caves and Karst. Some reviewers also question the accuracy and currency of cave and karst data and concerns have been raised that some caves, such as Zambujal Cave, have been damaged from vandalism and indirect impacts of quarrying.

As for fossils and dinosaur footprints, it is important to recall that the small natural *Pedra da Mua Natural Monument* had been one component of the serial nomination *Dinosaur Ichnites of the Iberian Peninsula* submitted by Portugal and Spain in 2009. IUCN at the time had recommended non-inscription. Consistent with this view, Arrábida's claim for global importance is weak given it is one small component within a larger complex of sites exhibiting fossil deposits and dinosaur prints. There are a range of more impressive dinosaur sites and dinosaur footprint sites globally.

The occurrence of Arrábida Brecchia is noted and has ornamental use in local religious architecture, which is a tangible local link between natural resources and culture/religion. However the occurrence of what the nomination refers to as a "unique lithological type" clearly does not provide any compelling basis to merit World Heritage listing, since countless sites globally present locally important exposures of a particular rock type. Several expert reviewers have questioned the uniqueness of the occurrence and also noted that many brecchia deposits have disappeared due to historical quarrying.

The nomination's claim for global scientific importance is more complex. According to the nomination the "diversity of geological processes" is outstanding for "our understanding and knowledge of fundamental stages of earth's history". This is specified as referring to (a) "4 stages of rifting that led to the fragmentation of Laurasia and the formation of North Atlantic"; and (b) "Arrábida being the only range on the Atlantic coast that bears witness to the closure of the Tethys Sea and subsequent formation of Mediterranean Sea due to the collision of Eurasian and African plates". Several reviewers challenge this claim noting other evidence within the North Atlantic such as the Portuguese Occidental Basin and evidence in Canada. Reviewers also point to failings in the characterization of the area's geological values noting that these are based on very old references dating from work in the 1930s. The types of values referred to are found in many areas with good geological exposures, which contribute to the understanding of particular regional tectonic or stratigraphic histories, but they do not provide a basis for the recognition of Outstanding Universal Value.

The nomination under criteria (ix) makes reference to both terrestrial and marine values. As for land, the case is made according to the vegetation, in particular the convergence of three floristic elements: Mediterranean, Euro-Atlantic, and Macaronesian on the coastal cliffs. Furthermore, it is stated that the combination of species of palaeo-Mediterranean and palaeo-tropical origin form "unique communities". The wide spectrum of succession stages well-known from contemporary cultural landscapes in Europe is ecologically valuable. The State Party repeatedly highlights the global importance of "the Mediterranean". At the same time, it fails to provide compelling evidence of the relative importance of Arrábida within this vast region. The available literature reveals no indication of Arrábida being outstanding by broader regional or global standards. Local endemism includes a few species of plants and arthropods and one land snail but is clearly not on par with many well-known protected areas, including numerous World Heritage properties. In terms of the small marine area included in the nominated area there is likewise also a noteworthy convergence of temperate, Mediterranean and tropical faunal elements. The marine values are noteworthy but scale, reserve design and state of conservation do not compare favourably with other areas.

With respect to criterion (x) the nomination makes frequent reference to the "Mediterranean Hotspot" described to be a "UNESCO priority for conservation". However, the nomination fails to demonstrate that Arrábida stands out within this vast region extending across numerous countries. The available literature, including previous comparative analyses conducted by UNEP/WCMC which look at Mediterranean and Iberian conservation priorities, does not indicate a prominent role for Arrábida from a global species conservation perspective. Similarly, the review of literature and the views of several expert reviewers familiar with the region

failed to generate compelling support for global importance.

Remnant stands of tree-sized Kermes Oak are remarkable, as the widespread species typically occurs as a shrub. Globally speaking, there are countless tree species with sometimes extremely restricted ranges. Both very distinct phenotypes within one genetic species and the occurrence of subspecies are common so none of the options would amount to a case for global importance. The presence of endemic species is of course of conservation importance but the degree is by no means conspicuous within the Mediterranean Basin, let alone outstanding by global standards.

Arrábida contains an impressive faunal assemblage. Birds include small numbers of nesting Bonelli's Eagle, Peregrine Falcon, Lesser Kestrel and Eurasian Eagle Owl. Publicly available Important Bird Area (IBA) information makes reference to European criterion C6 implying importance of large stretches of the Portuguese coast for "species threatened at the European Union level". Cape Espichel is important for bird migration. However, while a well-known birding spot, the nominated area is not of outstanding migration importance even within Portugal, as confirmed in recent national IBA exercises and by local ornithologists. The high invertebrate diversity includes 5 beetle species endemic to Portugal, one of which is local endemic. There is also an endemic land snail. Overall, terrestrial wildlife is not of global importance.

The mix of marine habitats is shaped by the eroding limestone cliffs and influenced by two major estuaries nearby. A 2011 survey cited in the nomination dossier recorded 1,320 "species of marine flora and fauna". One locally well-known particularity is a small resident population of Common Bottlenose Dolphin visiting the nominated marine area from the adjacent Sado Estuary. It is under heavy pressure from contamination and tourism (the number of dolphin-watching boats exceeds the number of dolphins).

The nomination lists more than 1,300 plant taxa with two local endemics, several Portuguese or Iberian Peninsula endemics and several rare species. Arrábida is, though, not within the 10 regional 'mini-hotspots' in the Mediterranean Basin based on high plant richness and narrow endemism. The plant diversity is high but many areas in the Mediterranean harbour considerably higher species numbers and much higher degrees of endemism, such as the Apennines, Pindos and Mount Olympus.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

Due to the multiple designations of the nominated area a complex set of legal instruments applies. However, there is no overall legal framework applicable in the entire

nominated area and some relevant legislation is applicable beyond the nominated area. Following an earlier cultural heritage designation, the "Arrábida Mountain Reserve" was set up in 1971. Subsequently, in 1976, a large part of the peninsula became Arrábida Natural Park, one of today's 13 protected areas under this category. Within the Portuguese protected areas system, the category refers to areas "predominantly containing natural or semi-natural ecosystems in which long-term biodiversity conservation can depend on human activity", reinforcing that these are modified natural landscapes dependent upon human intervention.

The area has been subject to progressive extension and is today a mosaic of terrestrial and marine areas. A number of protected areas are recognized under the European Commission Natura 2000 system. The terrestrial zonation defines several small "Integral Reserves", strictly protected areas in the sense of the IUCN categories which are accessible for research only. The bulk of the nominated area, however, falls under a regime equivalent to IUCN Protected Area Management Category V - Protected Landscape/Seascape.

Other applicable legislation includes forestry legislation dated 1901 which differentiates private ("partial forestry regime") and public land ("total forestry regime"). As the latter is almost non-existent in the nominated area, the former mostly applies. Environmental impact assessment (EIA) requirements are applicable to cement production and limestone quarrying. There are regulations for buildings and infrastructure and commercial tourism operations require licenses.

The nominated property is subject to a complex set of legal instruments and formal regulations. Nevertheless coherence and coordination across a diversity of legal designations and institutional jurisdictions remains a challenge. In addition there is no overarching legal protection linked to a single organization with a specific mandate and management responsibility for the nominated property.

Most of the nominated area and Arrábida Natural Park is located on privately owned land with only some 3% being public under the responsibility of the Port Authorities of Setubal and Sesimbra and the governmental Forest and Nature Conservation Authority. The holdings of private land encompass a broad range from one large estate around 1,200 ha to numerous medium and small size holdings.

IUCN considers the nominated property does not meet the protection requirements of the Operational Guidelines due to concerns regarding legal and institutional complexities and the lack of an overarching protection framework.

## 4.2 Boundaries

In terms of terrestrial integrity, most "natural" or "semi-natural" parts within the nominated area are very small and essentially limited to the rugged coastal hills. Historically, the shrubs and forests of the small coastal range were used for timber, firewood and charcoal production, medicinal plants, as well as for livestock grazing. More recently, reduced use pressure and formal protection have resulted in natural regeneration. Contrary to this trend, some areas have been severely affected by ongoing limestone quarrying. This includes the prominent coastal cliffs, as can be seen from both land and sea. Despite the exclusion of the quarries from the nominated area this constitutes an irreparable damage to the visual integrity. Other impacts include legal and illegal construction throughout the landscape, including the ongoing construction of vacation homes, in particular in and around Sesimbra. Furthermore, there are conspicuous limits to terrestrial connectivity, as the entire peninsula is cut off from its hinterland by major road infrastructure, urban sprawl and industrial zones. IUCN notes that these impacts were already evident at the time of the 1983 evaluation of Arrábida.

The marine areas have suffered from pollution from the nearby river mouths, past overfishing, dredging and impacts of recreational boating (anchoring), illustrated most dramatically by the almost complete destruction of once important seagrass beds. While there is encouraging evidence of recovery believed to be a function of marine conservation efforts, the small area is clearly still affected by many past and current threats.

In recognition of the conservation values in the area, there are several overlapping designations on the Espichel Peninsula. The nomination proposes a new configuration, partially coinciding with the existing designations. Even though most of the nominated area is located within Arrábida Natural Park, it includes areas outside the natural park while other areas within the natural park have been excluded from the nominated area. The stated rationale is the exclusion of limestone quarries and other degraded area located within Arrábida Natural Park. While this seems plausible, it is not clear on what grounds some parts of the two overlapping Natura 2000 sites have been included in the nominated areas, whereas others have not. Furthermore, thematic maps provided by the State Party during the field mission displaying values by each criterion suggest key areas identified by the State Party itself are located in both the nominated area and its buffer zone. Overall, the many different boundaries are confusing, especially as the boundaries on the ground are poorly demarcated, and raise questions for management and enforcement purposes in terms of clarity, mandates and coordination.

In terms of the marine protected area, the boundaries comprise the near-shore areas delineated in schematic straight lines, visibly demarcated by buoys. The boundaries appear to be designed for practical reasons

to facilitate surveillance of access and resource use restrictions, and so do not align with natural marine systems or ecological functions.

The buffer zones on land are small and are clearly incompatible with the basic requirements expressed in the Operational Guidelines as they partially coincide with urban areas, including major recent tourism apartment projects, industrial areas near Setubal and active and abandoned quarries (Zambujal, Achada, Calhariz and Outao).

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

### 4.3 Management

As noted above, management is complex, and additionally so because of the new boundary configuration chosen for the nomination. The national agency in charge of nature conservation and forestry (ICNF, Instituto de Conservação da Natureza e das Florestas) and AMRS have cooperated in the nomination, including through the establishment of various commissions and a World Heritage Nomination Forum. Beyond the institutional arrangements established to prepare the nomination dossier it is not clear how adequate and functional site management measures will be implemented.

The Arrábida Natural Park has a basic management structure, which overall seems adequate even though it struggles to cope with peaks of recreational activity during the summer. The main challenge for the nominated area appears to be the overall coordination and coherence between the park and its surroundings, including the areas recognized under Natura 2000. Beyond the nomination initiative, there is no history of coordinated management planning of the entire area and none appears to be foreseen. The various overlapping plans likewise raise questions of coherence and coordination.

At the regional level, the Regional Forest Spatial Planning for Lisbon's Metropolitan Area (PROF-AML), and the Regional Spatial Planning of the Territory (PROT-AML) deserve to be mentioned as planning frameworks. More specifically, there is a Strategic Plan for the Regional Development of the Setubal Peninsula (PEDEPES) and a 2005 Plan for the Arrábida Natural Park (POPNA). A management plan for the nominated area has been submitted at the time of nomination. It contains a useful descriptive part and a well-structured overview of prioritized objectives, activities and timelines. However, this plan falls short on basic requirements. The mostly descriptive document is more a framework and it does not specify mandates and responsibilities, activities and corresponding timelines and funding. It does not make comprehensive reference to various existing plans, let alone articulate how they will be brought together.

Funding supports basic requirements, however, consistent concerns were also expressed by NGOs and governmental staff about severe budget cuts for the entire national protected areas system. In conclusion, it is not clear how the nominated area as such, comprised of areas under different governmental responsibilities, would be funded in the future.

IUCN considers that the management of the nominated property does not meet the requirements of the Operational Guidelines due to shortcomings in the management plan, coordination challenges and unclear overall funding.

### 4.4 Community

The area is administratively located in the district of Setubal in its entirety within three municipalities. The three municipalities, Palmela, Setubal and Sesimbra, are united in an association named AMRS, which is one of the drivers of the nomination initiative. In this sense, there is administrative coherence and support.

In the marine realm, the establishment of the country's first continental Marine Protected Area (MPA) was accompanied by major conflict. These conflicts appear to have calmed down and are not associated with the World Heritage nomination. Still, it seems highly useful to continue to address the conflicts to ensure increased acceptance of the MPA.

The nomination initiative appears to be well-known locally. The field mission heard NGO concerns about perceived shortcomings of governmental conservation efforts and other concerns related to tourism, quarrying and cement production; however the nomination appears to be perceived as leverage to achieve better conservation, and is supported locally. Overall, the nomination appears to have brought together actors and stakeholders who otherwise rarely communicate. The MPA does not enjoy the level of consent of the terrestrial area due to access restrictions for local fishermen.

Private rights are clear and secured. The status as natural park entails some restrictions but is a "soft" category allowing for example conventional agriculture, quarrying concessions predating the establishment of the protected area and even construction under defined conditions. The situation of the MPA is more controversial, as its establishment has resulted in severe restrictions to access, including no-take zones.

As there is no clear institutional mandate for the nominated area beyond the nomination process, there is no recognizable major impact on management and decision-making beyond existing schemes. It can be argued that the nomination has triggered a new debate about the future of Arrábida which could eventually positively influence management and decision-making.

A successful nomination as proposed would not result in agriculture and harvesting of widely used medicinal plants are not restricted and would still continue in the event the property was inscribed. Local politicians and other stakeholders anticipate increased tourism benefiting the local economy, despite the area being already challenged to manage existing tourism during the peak season.

#### 4.5 Threats

On land, the visually most striking consequences of past development are the various limestone quarries, some of which are active with several decades of expected future operation. While the long-term biodiversity impacts may be limited and quarrying is expected to eventually be phased out, the scars in the landscape will remain in the long-term despite demanding restoration requirements. Tourism is described to be seasonally out of control resulting in major disturbance, traffic, waste management problems and increased fire risk. In the sea, past fishing is described as excessive and included destructive dredging to harvest bottom-dwelling species. The latter, along with recreational boating has led to the perhaps most dramatic impact, the almost complete destruction of seagrass beds. The assessment of pollution from adjacent estuaries is beyond the scope of this evaluation; however, despite recent improvements the past pollution of the Sado River from paper mills is a well-documented environmental concern.

Active limestone quarrying within Arrábida Natural Park is linked to valid concessions which predate the establishment of the natural park. While located in the buffer zones of the nominated area, the threat is visually not excluded and has compromised the visual integrity of the coastal cliffs. The terms of the concessions are volume-bound rather than time-bound meaning that there is no fixed planning horizon resulting in a potential operating timeframe of 40 to 50 years depending on demand.

Related to the quarrying, a large cement factory in the buffer zone near Setubal known as SECIL Outao needs to be mentioned. It is described as "one of the largest cement plants in Portugal" on the company's website ([www.secil.pt/default\\_en.asp?pag=outao](http://www.secil.pt/default_en.asp?pag=outao)). According to representatives of NGOs there are also concerns about pollution from waste used as a source of energy in the production.

Fires are part of natural disturbance dynamics, as illustrated by the many adaptations of local plants. The recovery of vast coastal areas from a high-intensity fire in 2004 is impressive. Control efforts in the summer and during peaks of visitation focus on man-made fires and are reported to prevent many fires. In the long run, controlled burning may increasingly become a dominant management element in parallel with prevention.

any changes to existing use restrictions. Local In terms of Alien Invasive Species (AIS) two exotic birds are reported but little seems known about the possible impacts.

Agricultural use has modified the hydrology of the small plains between the small ranges through widespread drainage. The more fundamental longer term question is the abandonment of traditional agriculture which is increasingly giving room to more intensive agriculture. It is not clear how management will address such changes.

In the marine realm the destruction of *Zostera* seagrass beds from illegal dredging for bivalves and anchoring of recreational boats seems finally addressed through the MPA, provided enforcement can be secured. While it was repeatedly suggested that some illegal recreational and commercial fishing continues to take place, the situation seems to have vastly improved. Water contamination, mostly from the Sado River estuary, is reported to have decreased but still constitutes a threat and a future risk.

Tourism and recreation is a major issue given the location within Portugal's Metropolitan Area and given the explicit intention to promote tourism, including though the World Heritage nomination. The objective is understandable but at the same time, there are clear indications that even the current levels of coastal and marine tourism and recreation exceed management and enforcement capacities. More recently, the demand for outdoor activities beyond the coast has been increasing, bearing new opportunities but also new risks. It is also unlikely that the development of new tourism opportunities will do anything to alleviate the existing pressure on conventional high use destinations, primarily the beaches.

To conclude, there are a large number of well-documented threats which, despite important progress, are only partially addressed. Construction remains an issue, while tourism is described as challenging locally and seasonally. The desired diversification of tourism may well result in certain benefits in terms of environmental and outdoor education. At the same time, increased tourism, including diversification beyond conventional beach tourism, no doubt bears many risks unless buffered by adequate planning, education and control.

In conclusion IUCN considers that significant integrity concerns relate to the nominated property principally arising from the limited areas of small natural or semi-natural areas and the loss of integrity arising most notably from limestone quarrying. In addition, the nominated property is subject to a number of legal, boundary, management planning, coordination and funding shortcomings. IUCN concludes that neither the integrity nor protection and management requirements of the Operational Guidelines are met.

## 5. ADDITIONAL COMMENTS

None.

## 6. APPLICATION OF CRITERIA

**Arrábida** has been nominated under all four natural World Heritage criteria.

### **Criterion (vii): Superlative natural phenomenon or natural beauty and aesthetic importance**

There is no evidence of any values, features or phenomena within the nominated property being globally superlative. In terms of landscape beauty, Arrábida is duly recognized as significant at the local, national and in some regards regional level. No case has been made to consider the nominated area globally significant based on landscape beauty or aesthetic considerations. While the setting is visually very attractive, it does not compare to the grandeur, scale, remoteness, intactness and visual integrity of many coastal protected areas.

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

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

The nomination argues the case for criterion (viii) based on Arrábida's karst, fossil, lithology and plate tectonic values. The stated values in terms of karst phenomena and fossils / ichnites (fossil footprints) values are not considered to meet criterion (viii). Arrábida's cave and karst systems do not compare favourably with many other systems within existing World Heritage sites. As for fossils and dinosaur footprints, IUCN recalls that the small *Pedra da Mua Natural Monument* within Arrábida had been one component of the large serial nomination *Dinosaur Ichnites of the Iberian Peninsula*, submitted by Portugal and Spain in 2009. At the time IUCN had recommended non-inscription. Within the larger Arrábida nomination these ichnite values are not of Outstanding Universal Value. The occurrence of Arrábida Breccia alone is clearly insufficient to meet criterion (viii). In addition much of the breccia is reported as having been removed through quarrying. The nominated property's plate tectonic values demonstrate evidence for regional tectonics and evolution of the Earth that are typical of many areas with diverse and well-exposed geology, and there are other sites that exhibit equivalent values.

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

### **Criterion (ix): Ecosystems/communities and ecological/biological processes**

The convergence of elements of different biographic regions and climate zones is noteworthy both in the Arrábida Mountains and the Arrábida Sea. Consequently, there are very particular ecological communities and species assemblages of conservation importance. Given the longstanding human occupation

and use, there are also interesting succession stages and dynamics. Notwithstanding IUCN concludes that there is no indication of global significance from the perspective of ecological and biological processes. Local endemism includes a few species of plants and arthropods and one land snail but is clearly not on par with many well-known protected areas, including numerous World Heritage properties. The marine values are noteworthy but scale, reserve design and state of conservation are clearly not of a standard comparable with other marine World Heritage sites. Comparative analysis concludes that the terrestrial and marine ecosystems covered by the nominated site, whilst found within the Mediterranean Basin hotspot, are unlikely to represent one of the best examples of such globally significant ecosystems.

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

### **Criterion (x): Biodiversity and threatened species**

The terrestrial species values are locally and nationally important, in particular as regards the flora. The latter may have conservation importance beyond national level. However, by the standards of inscribed natural World Heritage properties and other areas known for their floral biodiversity importance, the nominated area does not stand out globally. Comparative analysis concludes that the nominated site hosts an important proportion of fauna and flora species that can be found in the Mediterranean Basin hotspot; however, while this biodiversity value is significant, it is not considered sufficient to meet biodiversity criteria, compared to existing World Heritage sites from the region, such as Doñana National Park. The nominated property contains important marine ecological aspects, however, the small scale, impacts of longstanding overfishing, destruction of seagrass and pollution from adjacent river estuaries clearly do not make the marine area a candidate site of global importance.

IUCN concludes 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-14/38.COM/8B and WHC-14/38.COM/INF.8B2;

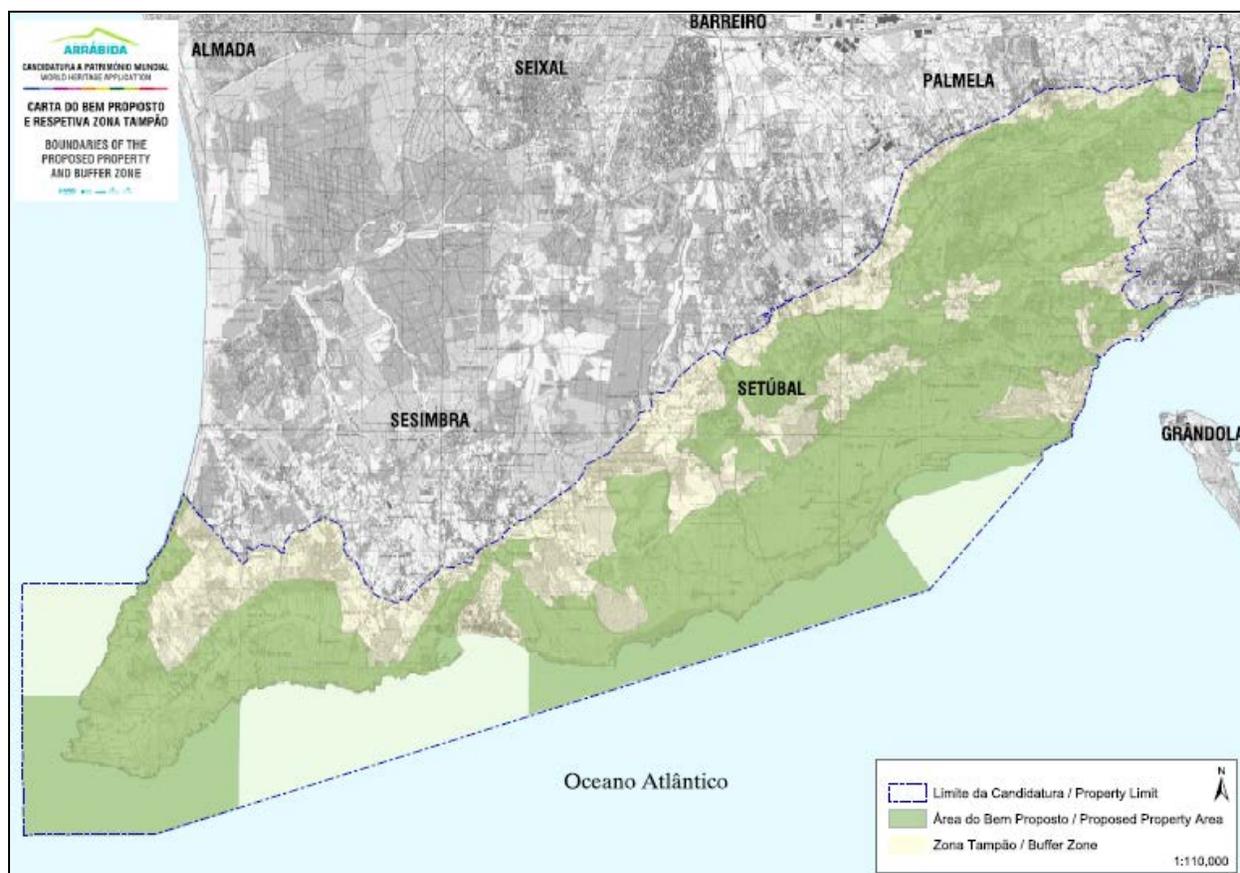
2. Decides not to inscribe Arrábida (Portugal) under natural criteria (vii), (viii), (ix) and (x).

3. Expresses its appreciation to the State Party for its commitment to the protection of the nominated property and encourages continued efforts to manage the entire Peninsula in an integrated manner.

**Map 1:** Nominated property location



**Map 2:** Nominated property and buffer zone





**LATIN AMERICA / CARIBBEAN**

**ANCIENT MAYA CITY AND PROTECTED FORESTS OF  
CALAKMUL, CAMPECHE**  
(Extension and renomination of the “Ancient Maya City of  
Calakmul, Campeche”)

**MEXICO**





## WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

### ANCIENT MAYA CITY AND PROTECTED TROPICAL FORESTS OF CALAKMUL, CAMPECHE (MEXICO) – ID 1061 Bis

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** To defer the nomination.

**Key paragraphs of Operational Guidelines:**

Paragraph 77: Nominated property has the potential to meet World Heritage criteria.

Paragraph 78: Nominated property does not meet integrity or protection and management requirements.

**Background note:** The *Ancient Maya City of Calakmul, Campeche* was inscribed under cultural criteria (i), (ii), (iii), and (iv) in 2002. The cultural property is 3,000 hectares (ha) in size with a buffer zone of 147,195 ha. This is a renomination and extension of the existing Ancient Maya City as a mixed site.

#### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 20 March 2013

**b) Additional information officially requested from and provided by the State Party:** No supplementary information was formally requested by IUCN, however the State Party submitted additional information on 26 February 2014 following dialogue between the State Party, ICOMOS and IUCN. Additional information was provided on boundaries; arguments in support of Outstanding Universal Value; and a number of additional articles on the natural values of the nominated property.

**c) Additional literature consulted:** Various sources, including: Badman, Tim et al (2008). **Natural World Heritage Nominations; A Resource Manual for Practitioners.** IUCN World Heritage Studies, Number 4. (2008). **Outstanding Universal Value; Compendium on Standards for Inscriptions of Natural Properties on the World Heritage List.** IUCN World Heritage Studies, Number 1. Bath, Paquita and Allen Putney (2010). **Final, Independent Evaluation of SINAP II.** Report to the Mexican Fund for the Conservation of Nature. Colette, Angustin, et al, editors (2007). **Climate Change and World Heritage ; Report on predicting and managing impacts of climate change on World Heritage, and State to assist State Parties to implement appropriate management responses.** World Heritage reports 22. UNESCO, Paris. CONANP (2012). **Sistema General de Programas Operativos Anuales, Resultados de la Evaluación Anual 2012,** Región Península de Yucatán y Caribe Mexicano. Diario Oficial de México (7 de abril, 2007). **Programa de Manejo del Área Natural Protegida con el carácter de Reserva de la Biosfera la región conocida como Calakmul, ubicada en los municipios de Champotón y Hopelchén (hoy Municipio Calakmul), en el Estado de Campeche.** Fundación Desarrollo Sustentable A.C. (May, 2011). **Cuarto Reporte del Proyecto Programa de Monitoreo Adaptativo de la Reserva de la**

**Biosfera de Calakmul.** Contrato CONAP A-P-VO2-RBCA-FDS-11. Gobierno de México (May, 1989). **DECRETO por el que se declara la Reserva de la biosfera Calakmul, ubicada en los Municipios de Champotón y Hopelchem,** Camp. Parks Watch Mexico (Undated). **Profile: Calakmul Biosphere Reserve.** Ramón Pérez Gil Salcido, et al (2003). **Evaluación Independiente SINAP I. Report to the Mexican Fund for the Conservation of Nature.** Sánchez-Cordero, Víctor et al (Nov. 2008). **Diagnostico de la efectividad de las Áreas Naturales Protegidas (ANP) Federales para prevenir el cambio en el uso del suelo y la vegetación.** CONANP. Schmook, Birgit et al (2005). **Línea de Base para el Programa COMPACT en Calakmul.** Sprajc, Ivan, editor (2008). **Reconocimiento arqueológico en el sureste del estado de Campeche, México, 1996-2005.** Paris Monographs in American Archaeology 19. BAR International Series 1742. UNESCO, México (Nov., 2009). **Estudio de la Contribución de los Sitios Patrimonio Mundial al Desarrollo;** Williams, Paul (June, 2008). Yam Camacho, Marco Antonio et al (Abril de 2013). **Calakmul, Linda Tierra Campechana, Antología para el Maestro.** D. R. Secretaria de Educación, Gobierno del Estado de Campeche.

**d) Consultations:** 6 desk reviews received. The mission also met with the Federal Secretary of the Environment; the Governor of Campeche State; the Director of INAH; the Director of CONANP; the Mayor of the Calakmul Municipality; protected area personnel; community leaders in the Buffer Zone; researchers from local universities; Head Archaeologist and Chief of Restoration of the Calakmul Archaeological Site; Members of the Calakmul Biosphere Reserve Advisory Committee and several other stakeholders.

**e) Field Visit:** Allen Putney with Barbara Arroyo (ICOMOS), 30 September - 4 October 2013

**f) Date of IUCN approval of this report:** March 2014

## 2. SUMMARY OF NATURAL VALUES

The nominated property, Ancient Maya City and Protected Tropical Forests of Calakmul, Campeche, Mexico, is a re-nomination and extension of the existing 3,000 ha cultural World Heritage property, Ancient Maya City of Calakmul, Campeche. The nominated property is located in the central/southern portion of the Yucatan Peninsula, in southern Mexico. The total area of the re-nominated property is 331,397 ha, which is superimposed on the south-central portions (the “core zone”), of the 723,185 ha Calakmul Biosphere Reserve, Mexico’s largest protected area. The surrounding Biosphere Reserve zones are therefore considered as a buffer zone of 391,788 ha for the re-nominated property, which is not included within the nominated property. The nominated property has an unusual configuration with the nominated area adjoining the border with Guatemala, and the Mirador-Rio Azul National Park. Tikal National Park, inscribed in 1979 as a mixed site under criterion (i), (iii), (iv), (ix) and (x) lies to the south of the property. The buffer zone of the nominated property extends northwards through a relatively narrow corridor expanding to a larger area.

The main geomorphological unit of the re-nominated property is of karstic origin. This karstic system is composed of both carbonaceous rocks (limestone, dolomites, marble), which make up 72% of the area, and evaporites (gypsum, anhydrites, rock salt or hyalites), which make up the remaining 28%. Rainfall in this sub-humid tropical rainforest is concentrated in the wet season. The carbonaceous rocks are highly porous and do not retain surface water, except for a short period after drenching rains. The evaporites, on the other hand, retain water for long periods in depressions called aguadas. It is these aguadas that provide surface water during much of the dry season and make possible human habitation and are crucial for wildlife. However, as temperatures increase and rainfall becomes erratic due to climate change, many aguadas have, in recent years, become dry at the end of the dry season.

The humid and sub-humid tropical forests of the Yucatan Peninsula in Mesoamerica are the second most extensive tropical forest region, after the Amazon, in the Americas. Mature forests cover the re-nominated property, and represent the northern limit of distribution of tropical Central American Forests. They are subject to seasonally dry conditions, karst soils, frequent fires and hurricanes, and thus have developed a number of adaptations to these conditions. In addition, these forests are the result of ancient agricultural and forestry practices of one of the great cultures of the world, the Mayans. The re-nominated property has been exploited and managed by Mayan cultures for thousands of years. The nomination is submitted as a mixed property and a wide range of cultural sites exist within the proposed extension. These will be evaluated by ICOMOS in relation to cultural criteria. Given the particular nature of the proposal as an extension and re-nomination of an existing cultural property, IUCN has also sought to the

greatest extent possible, to harmonise its recommendations with those of ICOMOS.

The nominated property is located at a crossroads of connectivity with corridors that provide ecological continuity to the extensive forests of the region in Mexico, Guatemala, and Belize. The Calakmul Biosphere Reserve certainly is known for its great abundance of wildlife in the Selva Maya Forest Region. This has served to maintain the dynamic, ecological and evolutionary processes of native species, especially those with wide ranging habitat requirements.

The nominated property falls within the Mesoamerica biodiversity hotspot. This hotspot is the third largest in the world and encompasses all subtropical and tropical ecosystems from central Mexico to the Panama Canal. It hosts several endemic species including Quetzals, Howler Monkeys, and 17,000 plant species. It is also an important corridor for many Neotropical migrant bird species; the montane forests are important for amphibians, especially as several endemic amphibian species are in decline due to habitat loss, fungal disease and climate change. The biodiversity of Mesoamerica is at the confluence of two biogeographic regions (Nearctic and Neotropical) and is very rich as a consequence of this interaction. The nominated property displays rich biodiversity with species complements comprising 1,569 plant, 107 mammal, 398 bird, 84 reptile, 19 amphibian and 48 fresh water fish species. The nominated property also exhibits high levels of endemism within the Mesoamerican hotspot. According to the nomination dossier, almost a quarter of all mammals found in the hotspot are present within the nominated area, as well as 35% of bird species. The nominated property does not belong to any Terrestrial or Global Freshwater 200 priority ecoregion, Endemic Bird Area (EBA), or Centre of Plant Diversity (CPD).

## 3. COMPARISONS WITH OTHER AREAS

IUCN has fundamental concerns regarding how this nomination has been constructed and presented which make it challenging to evaluate in terms of comparative analysis. The current dossier focuses substantially on natural values in the area surrounding an existing cultural property when in reality the intertwining of natural and cultural values is present throughout the property. This approach is reinforced within the nomination dossier itself which acknowledges that “*the property is nominated because it incorporates mature tropical forests, extraordinary evidence of the long interaction between man and nature, reflected in their current structure and floristic composition, and largely the result of Maya agricultural and forestry practices*”.

The nomination dossier includes a comparative analysis which, for natural values, assesses the property against 24 existing World Heritage properties inscribed for similar criteria and characteristics. The analysis concludes that the closest comparator is Tikal National

Park (Guatemala), which is c.10% of the size of the nominated property. IUCN emphasizes that the ecosystems of the nominated property are the product of evolution and adaptation under the prevailing environmental influences that in turn were significantly modified by the management practices of the Mayan cultures that inhabited the region continually for over 2,000 years (1,200 B.C. to 950 A.D.). Indeed, some 90% of the site's flora is today used in one way or another by people, a clear sign of human interaction with the property's ecosystems. The nomination dossier demonstrates that the property has significant biodiversity; however, the case for global significance is not well backed up by the information provided in the comparative analysis, and the case regarding endemic and endangered species only refers to its regional significance.

Additional comparative analysis has been undertaken by IUCN and the UNEP World Conservation Monitoring Centre (UNEP-WCMC) along with a review of the additional scientific references provided by the State Party in its information of February 2014. This analysis notes that Mexico has five existing natural World Heritage sites, including one biodiversity site on the Yucatan peninsula, Sian Ka'an, and it confirms that the closest existing natural World Heritage site to the nominated property, also a biodiversity site, is indeed Tikal National Park in Guatemala. UNEP-WCMC, when comparing the nominated property with other sites within the Mesoamerica hotspot, concludes that the nominated property appears to have an almost identical species richness profile as Tikal National Park in Guatemala. Species data is limited; however, numbers of mammals, birds, reptiles and amphibians are comparable, as are the numbers of threatened species.

Regarding criterion (ix), the nominated property is part of a biogeographical province, biome and ecoregion which is already well represented on the World Heritage List. Furthermore, the Mesoamerican hotspot is also well represented, again notably by the Tikal National Park. For criterion (x) it notes that the nominated property supports a similar number of species as many existing natural World Heritage properties found in the same region; however, it hosts almost a quarter of the mammal and over a third of the bird species found in the Mesoamerica hotspot. The property indeed has a very diverse vertebrate fauna, including mammal species such as the Jaguar, Puma, Ocelot, Howler Monkey, Spider Monkey, Armadillo and Tapir, some of which are threatened of extinction. Whilst the importance of Campechean rainforest in the Udvardy Neotropical Realm is noted at a broad scale, the nominated property is not explicitly mentioned within a number of relevant IUCN Thematic Studies such as studies on biodiversity gaps, irreplaceability and forests.

Thus there are a range of further reviews of the biodiversity values required to support the nomination. IUCN considers that it is clear that the nominated property has notable biodiversity values. The nominated

property is the second largest forest in Mesoamerica after the forest of Petén in Guatemala. In terms of biodiversity Calakmul is considered the richest Mayan forest on the Yucatan Peninsula, not only due to the way these forests were managed by the Mayans but also because it is located in an area with greater availability of freshwater; both from rain and from existing aquifers.

In summary, IUCN is concerned on both the overall approach to defining the basis of the proposed renomination and extension, as well as the need for further global and regional studies on comparative biodiversity values. IUCN also considers it essential that the approach to demonstration that the natural criteria are met in the renomination, needs to be harmonised with the proposed extension of the existing cultural World Heritage property. The nominated property, with significant revisions, has potential to meet both criteria (ix) and (x).

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

The legal and institutional framework for the protection of the natural resources of the renominated property is adequate and secure. The buffer zone of the property aligns with the Calakmul Biosphere Reserve.

Some 88.5% of the property is in Federal Government ownership. The remaining 11.5% is in community lands that have been abandoned, and are in the process of reverting back to Federal Government ownership. The lands in the buffer zone are community owned, and are expected to remain so. Human populations in these areas, which are within the Biosphere Reserve, are increasing, and resource use is intensifying. Management programmes are in place to work with these communities to ensure that development activities are sustainable and do not present a threat to the core zone of the Biosphere Reserve, which coincides with the area of the renominated property. These Biosphere Reserve management programmes are actively guided by an Advisory Committee made up of representatives of relevant Federal, State, and Municipal governments, local universities, and local communities.

IUCN consider that the protection status of the nominated property in relation to natural values meets the requirements of the Operational Guidelines.

### 4.2 Boundaries

The logic of the boundaries of the nominated property and the configuration of the proposed buffer zone are not clear with respect to how they protect and buffer the natural values of the nominated property; particularly the buffer zone area to the north of the property.

The forest characteristics of the nominated property are the product of intense human manipulation over a period

of centuries, especially the practice of slash and burn agriculture with long fallow periods, and thinning of secondary forest to favour species of particular use to humans. However, the property was abandoned around 950 A.D. and since has only been logged on a highly selective basis. There is currently no human occupation and none is contemplated for the future. Thus, over a very considerable time, the forest ecosystems of the property have recovered from human modification through natural regeneration. In order to recognise the natural values of the property but also interactions that could be relevant to its potential status as a mixed property, the boundary configuration of the nominated property would need to be adjusted. It may thus be appropriate to include areas of the current buffer zone within the nominated area.

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

#### 4.3 Management

The nominated property's cultural and natural assets are managed independently by different agencies. The Comisión Nacional de Areas Naturales Protegidas (CONANP) assume responsibility for natural heritage whilst the National Institute for Anthropology and History (INAH) is responsible for management of the existing 3,000 ha Ancient Maya City of Calakmul cultural World Heritage property.

CONANP's existing on-the-ground management capacity for the Calakmul Biosphere Reserve appears to be adequate for natural resource protection. This is partially demonstrated by a CONANP report on the implementation of the 2012 Annual Work Program for the Reserve which indicated that 97% of the 187 activities planned for the year were executed successfully. Thus, CONANP should have adequate capacity to contribute effectively to an integrated approach to management of the re-nominated property. Whilst the management of cultural aspects will be considered by ICOMOS, it is unclear to IUCN how INAH's current management capacity would be enhanced to effectively support an integrated management approach over a significantly larger area.

There is no integrated management plan for the proposed renominated mixed property. Rather CONANP has a management plan in place for the existing Biosphere Reserve, which was revised in 2010 and is currently undergoing further revision. A biological monitoring system is in place for the Biosphere Reserve, which is contracted out to local universities. There is no system in place for tracking and improvement of management effectiveness, though some relevant indicators, such as changes in indicator species populations and dynamics and land use change are being tracked. There is a management plan in place for the Calakmul cultural World Heritage property, but there

is no system in place to track and improve its management effectiveness.

The current budget for the Biosphere Reserve is about 700,000USD p.a. and the level of funding over the past 7 years has been relatively stable, though sources of funding have changed considerably. Since the biological indicators and land use change indicators have not varied much over the same period, it would seem that the level of funding is adequate, at least for basic protection and management.

Memoranda of Understanding are in effect between the governments of Mexico and Guatemala to facilitate transboundary management relating to the Calakmul Biosphere Reserve in Mexico and the Mirador-Rio Azul National Park in Guatemala. From 2007 to 2010 an Inter-American Development Bank (IDB) Project facilitated management of the Tri-National Ecosystem of the Maya Tropical Forest (Mexico-Belize-Guatemala) through improved negotiation, coordination, and cooperation capacities, especially with respect to the control of illegal trade of plants and animals, development of biological corridors, establishment of a biodiversity monitoring and information management system, and strengthened institutional framework for joint management of the Maya Tropical Forest. Since termination of the IDB Project, tri-national activities have significantly reduced, but a new project, supported by the German Agency for Technical and Scientific Cooperation (GIZ) and the German Development Bank (KfW), aims at developing a new tri-national program for the Protection and Sustainable Use of the Tropical Maya Forest.

IUCN considers that the management of the nominated property, as a mixed nomination, does not meet the requirements of the Operational Guidelines.

#### 4.4 Community

It is noted that local communities have migrated from rural areas to existing villages and key cities, mainly Mérida. This is positively contributing to the conservation of Calakmul because impacts from local people are minimal when compared to other areas in Mexico.

While governance arrangements for the existing Biosphere Reserve and cultural World Heritage Property are adequate, there are inadequate mechanisms in place for integrated management of the natural and cultural resources of the re-nominated mixed World Heritage Property. Stakeholder involvement in the management of the existing Biosphere Reserve is facilitated through the Reserve's Advisory Committee and through field projects with local communities. This Committee would also serve the renominated extended World Heritage Property should it be approved.

There are no local communities living within the nominated property. An in-depth process of local consultation took place when the lands within the property were transferred to the Government in 2004 with the agreement of those communities. Subsequently, detailed information about, and consultation on, management of the Property has taken place through the Reserve Management Advisory Committee which includes representatives of all 31 communities in the buffer zone. The tenure rights of the communities that had land within the re-nominated property were acquired by purchase by the Government, a process fully supported by these communities.

Livelihood development and benefit-sharing in the buffer zone of the nominated property are facilitated by diverse programmes sponsored by the Biosphere Reserve. These include economic activities related to the development and management of beehives and subsequent development and marketing of honey derived products; improved farming and forestry, the development and marketing of artisan crafts, and tourism activities.

#### 4.5 Threats

During the 2,000 year period of intense occupation by the Mayan culture, up to 1000 years ago, much of the area was converted to agriculture and intense forestry. However, during the last c.1,000 years, the nominated property has been free of human occupation and has only been subject to occasional past selective logging of high value trees. Thus the forests can be regarded as substantially natural, evolving ecosystems given the period that has elapsed to allow natural values to be reestablished. However, one question for management is the degree to which archaeological sites may be cleared of vegetation in order to facilitate research, preservation and interpretation of the nominated property's cultural values.

The most significant threat to natural values stems from climate change which is already manifest in a reported 3.0 °C increase in average temperature over the last decade, and decreased rainfall. Since there is little altitudinal variation in the property, and increasing drying up of aguadas during the seasonally dry period, it can be expected that many species of flora and fauna will simply be lost.

Another threat is tourism, which is reportedly increasing at about 9% per year. However, the current overall levels of visitation are low. In 2011, for example, the last year for which complete statistics are available, there were close to 25,000 visitors. The area of the City of Calakmul itself is already a World Heritage property, so it is not expected that the renomination will have much effect on stimulating even greater increases in tourism. Calakmul is relatively isolated, and many other Mayan archaeological sites that have been restored and are open to tourism are in more accessible places. Thus, it is

expected that the increases that do occur can be managed without major problems.

Human populations in the buffer zone of the property, currently 2,625 inhabitants in 31 communities, are increasing. Thus, even though management programs for the existing Biosphere Reserve seek to assure that all resource use within the Reserve is sustainable, pressure from increasing populations could at some point threaten sustainability.

Concerns exist related to the boundaries and integrated management requirements of the re-nominated and extended property; IUCN therefore considers that the nominated property does not meet the requirements of the Operational Guidelines.

#### 5. ADDITIONAL COMMENTS

None.

#### 6. APPLICATION OF CRITERIA

The **Ancient Maya City and Protected Tropical Forests of Calakmul, Campeche** has been nominated under natural criteria (ix) and (x).

##### **Criterion (ix): Ecosystems/communities and ecological/biological processes**

For over 2,000 years, the Mayan civilization made intensive use of the resources of the nominated property. The tropical forest that exists today grows on top of the archaeological remains of that great civilization, and the interaction of natural and cultural values is manifest throughout the re-nominated and extended property. However, the nomination as currently presented has not yet made a compelling case under this criterion with respect to a mixed site. The ecosystems of the site are the product of evolution and adaptation under the prevailing environmental influences that in turn were significantly modified by the management practices of the Mayan cultures over many centuries. Nevertheless the diversity of ecosystems, large size and relatively intactness of this area of Mayan Forest, together with its significance within the Mesoamerican Hotspot suggests the potential to meet criterion (ix).

IUCN considers that the site has potential to meet this criterion but that further consideration is needed, including the interaction of natural and cultural values within the existing property and the proposed extension.

##### **Criterion (x): Biodiversity and threatened species**

The re-nominated and extended property is located in the second largest forest in Mesoamerica after the forest of Petén in Guatemala and in terms of biodiversity the area has levels of species richness, endemism and threatened species which compare or may even surpass those of other Mayan tropical forest sites in the region.

As with criterion (ix), the consideration of the nominated property's values under criterion (x) requires further consideration by the State Party, both in relation to the comparisons with other sites in the region, and also regarding the configuration of the proposed extension and renomination, in relation to the much smaller existing cultural property of Calakmul and the reality that the forested areas are an essential part of this cultural context of Calakmul.

IUCN considers that the site has potential to meet this criterion, but that further consideration is needed, including the interaction of natural and cultural values within the existing property and the proposed extension.

In addition, IUCN notes that issues of boundaries of the nominated property, and its buffer zone in relation to both protection of natural values, and relationship to a possible mixed site need to be addressed, together with improvements to effectiveness of integrated management.

## 7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC-14/38.COM/8B and WHC-14/38.COM/INF.8B2;

2. Defers the nomination of the **Ancient Maya City and Protected Tropical Forests of Calakmul, Campeche (Mexico)** under natural criteria.

3. Recommends the State Party, with the support of IUCN, ICOMOS and the World Heritage Centre, to reconsider the approach to the proposed extension and renomination of the property based firstly on considering how the extension would relate to the existing listing as a cultural property as well as the associated cultural values of the surrounding forest areas, and secondly to consider how a renomination and extension could be configured to meet both cultural and natural criteria.

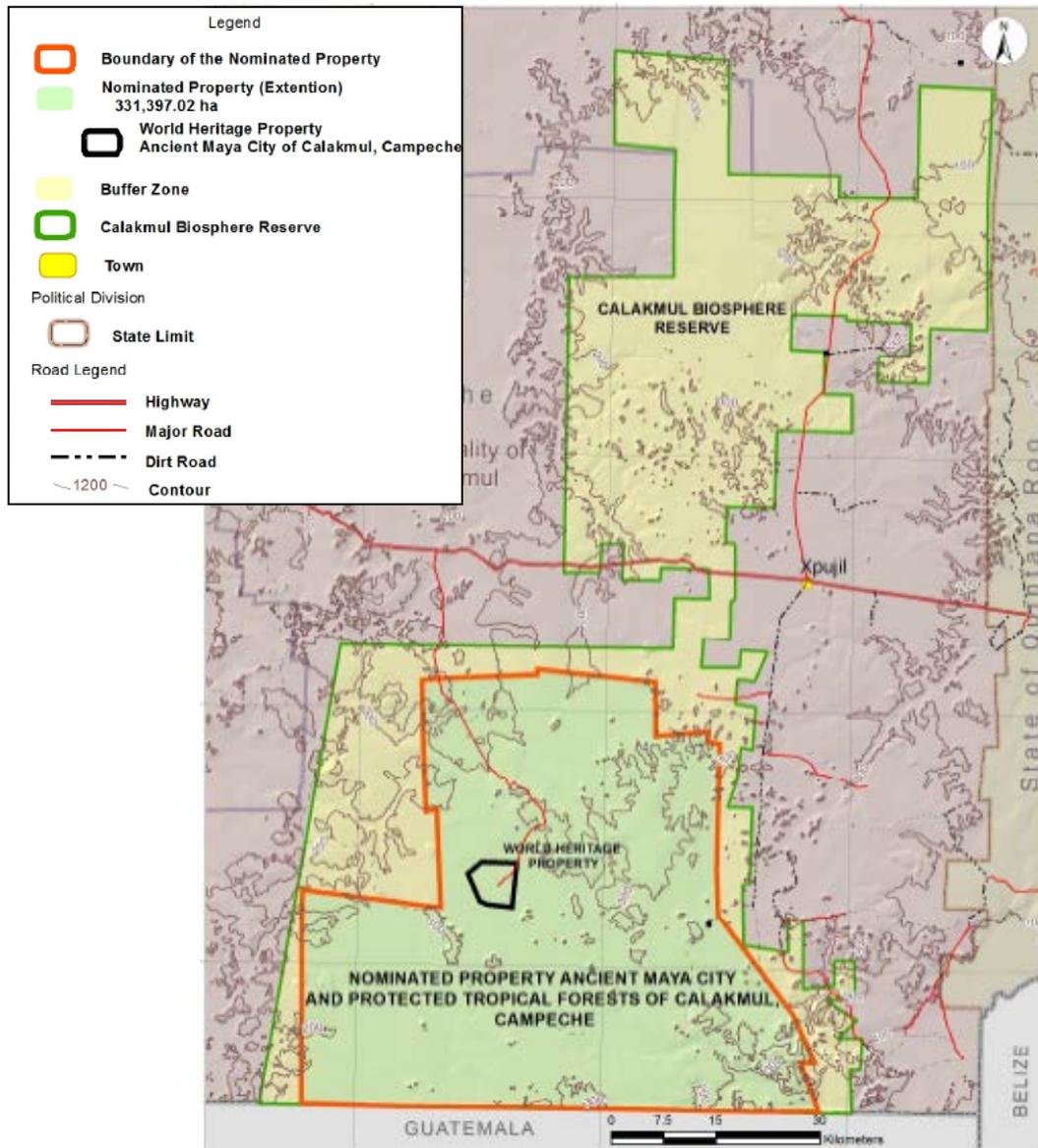
4. In relation to the proposed renomination and extension under natural criteria, recommends the State Party to consider:

- a) revising and improving the interpretation of the property's natural values cognizant of the longstanding history of human modification of the landscape;
- b) revising and improving the comparative analysis of the property in relation to natural criteria, to demonstrate how the biodiversity values of the property relate to other protected forest sites in the region, taking note of the history of human interaction with nature, and the potential for a nomination to meet criteria (ix) and (x);
- c) refining the boundaries of the property to assure the integrity of the property, include in the property all areas of significant natural values, and ensure that the buffer zone is configured in a rational way designed to protect the nominated property;
- d) addressing the need to strengthen integrated protection and management of natural and cultural values across the property including improved interagency coordination, governance, resourcing and capacity development; and
- e) preparing a single property wide management plan to guide integrated natural and cultural heritage protection and management.

**Map 1:** Nominated property location



**Map 2:** Nominated property and buffer zone





## **C. CULTURAL PROPERTIES**

### **C1. NEW NOMINATIONS OF CULTURAL PROPERTIES**



**AFRICA**

**MOUNT MULANJE CULTURAL LANDSCAPE**

**MALAWI**



## WORLD HERITAGE NOMINATION – IUCN COMMENTS TO ICOMOS

### MOUNT MULANJE CULTURAL LANDSCAPE (MALAWI)

The area of nominated property is 64,250ha, with a proposed buffer zone of 85,100ha.

The property is nominated under criteria (iv), (v) and (vi)

IUCN notes that ICOMOS will evaluate the nomination in relation to the cultural criteria under which the property is nominated.

IUCN considered this cultural landscape nomination based on a desk review of the nomination and considered the comments of seven external reviewers.

The core of the site is made up of a single protected area, first gazetted in 1927 as Mulanje Mountain Forest Reserve.

A spatial analysis of the area showed the site contains an Important Bird Area (IBA), an Alliance for Zero Extinction site (AZE) and a Centre for Plant Diversity (CPD).

The area was highlighted in Bertzky *et al* (2013) as a potential priority for nomination as a terrestrial biodiversity World Heritage Site, and listed in the top 1% of the most irreplaceable protected areas for biodiversity (Bertzky *et al* 2013; Le Saout *et al* 2013). Additionally, the site has been on Malawi's Tentative list since 2000.

The high number of near endemic, regionally endemic and native economical, cultural and medicinal species across the biota is significant. In addition the site contains one terrestrial ecoregion – South Malawi montane forest-grassland mosaic – that is not currently represented on the World Heritage List.

IUCN also notes that the property has been the subject of several significant conservation and development projects supported by international organisations. Interventions are aimed at balancing watershed management, sustainable natural resource management for local people; and preserving globally significant biodiversity.

In terms of boundaries, the site integrity appears to be good as the buffer zone contains the entire mountain. The nominated property is already a Protected Area,

while the buffer zone also incorporates traditional villages.

As noted below, there are integrity concerns related to mining and timber extraction.

There is some evidence from IUCN's review base that the site is considered important for the interaction between natural resources, humans and spiritual belief systems. As outlined in the nomination, the cultural taboos regarding access to this sacred natural site (SNS) remain strong, and represent a good example of ongoing cultural tradition with a strong linkage to the landscape.

#### Recommendations

Given the very significant natural value of the site, and noting the inclusion of the site on Malawi's Tentative List for criterion (x), not as a possible cultural site, IUCN recommends that the site may have the potential to meet the biodiversity criteria (criteria ix and x), however further analysis and review are needed, and also on integrity and protection and management concerns, which it appears likely would not be met for this site.

IUCN also recommends an official statement be sought from the State Party that mining will not happen on the site and notes the clear position adopted by the World Heritage Committee that mining is not compatible with World Heritage Site status. While the nomination file notes that the government of Malawi has instructed prospecting to stop and is aware that mining is not acceptable in a World Heritage Site (Nomination document, page 73), the management plan notes the working assumption that mining can be done only if the ecological health status of the reserve will not be compromised (Appendix 6, page 21). There seems to be some conflict between these two positions that need to be clarified.

IUCN also notes concerns about the level of logging of the endemic Mulanje Cedar tree that could lead to the species functional extinction. The management plan does not sufficiently address the issue of managed and illegal logging of this species, as well as other threats to the property.

#### References used

- Bertzky, B., Shi, Y., Hughes, A., Engels, B., Ali, M.K. and Badman, T. (2013) Terrestrial Biodiversity and the World Heritage List: Identifying broad gaps and potential candidate sites for inclusion in the natural World Heritage network. IUCN, Gland, Switzerland and UNEP-WCMC, Cambridge, UK.
- Le Saout, S., Hoffmann, M., Shi, Y., Hughes, A., Bernard, C., Brooks, T.M., Bertzky, B., Butchart, S.H.M., Stuart, S.N., Badman, T. & Rodrigues, A. (2013) Protected Areas and Effective Biodiversity Conservation, *Science*, 342: 803-805.



**AFRICA**

**BAROTSE CULTURAL LANDSCAPE**

**ZAMBIA**



## WORLD HERITAGE NOMINATION – IUCN COMMENTS TO ICOMOS

### BAROTSE CULTURAL LANDSCAPE (ZAMBIA)

The area of nominated property is 796,000ha, with a proposed buffer zone of 5,916,800ha.

IUCN considered this cultural landscape nomination based on a desk review of the nomination and considered the comments of three external reviewers.

IUCN notes that ICOMOS will evaluate the nomination in relation to the cultural criteria under which the property is nominated.

The property is nominated under criteria (iii), (iv) and (vi).

The buffer area of the site overlaps with numerous protected areas, including National Parks, Forest Reserves, Game Management Areas and Ramsar sites. The core area is part of the extensive Zambesi Floodplains Ramsar site. However, not all of the Ramsar site is incorporated into the proposed WHS and the boundary as it stands may not be sufficient for the integrity of the wetland.

The site is approximately 160km upstream of the Victoria Falls World Heritage Site.

The site is also an Important Bird Area (IBA).

Notwithstanding the long history of human settlement, as outlined in the nomination file and Ramsar Information Sheet (Ramsar 2006) the site seems to have considerable natural value, in terms of vegetation, species and hydrology. The flood plain is formed of windblown Kalahari sands. The Ramsar description of the site refers to extensive grasslands (rather than swamps), with occasional raised woodland areas.

#### References used

Ramsar (2006) Information sheet on Ramsar wetlands: Zambesi Floodplains. ([http://sites.wetlands.org/reports/ris/1ZM007%20RIS\\_2007.pdf](http://sites.wetlands.org/reports/ris/1ZM007%20RIS_2007.pdf))

Protection of the site is reportedly enforced through strong traditional management systems and legislation to safeguard the key cultural elements of the landscape. Coupled with the potential natural values, the site may have potential as a mixed nomination.

#### Recommendations

IUCN notes that the natural values of this property are important at an international level as recognised by its Ramsar status. The natural values are not adequately considered in the nomination, and options to harmonise the property with the Ramsar listing in the area should be considered. IUCN recommends that the boundary of the property should be reviewed and potentially extended to incorporate the entire wetland system, in order to strengthen the integrity wetland and hydrology of the site.

IUCN also recommends an official statement be sought from the State Party that mining will not happen on the site prior to any consideration of possible World Heritage listing as a cultural property, and notes the clear position adopted by the World Heritage Committee that mining is not compatible with World Heritage Site status. Oil and gas exploration concession blocks are located throughout the site, however, it is not clear in the nomination file as to whether exploration is underway, or if these concessions will be revoked should the site become a World Heritage Site.



**EUROPE / NORTH AMERICA**

**CULTURAL LANDSCAPE OF VALLE SALADO DE ANANA**

**SPAIN**



## WORLD HERITAGE NOMINATION – IUCN COMMENTS TO ICOMOS

### CULTURAL LANDSCAPE OF VALLE SALADO DE ANANA (SPAIN)

The area of nominated property is 13.5ha, with a proposed buffer zone of 323.5ha.

IUCN notes that ICOMOS will evaluate the nomination in relation to the cultural criteria under which the property is nominated.

IUCN considered this cultural landscape nomination based on a desk review of the nomination and considered the comments of five external reviewers.

The property is nominated under criteria (iii), (iv) and (v).

The boundary of the site appears to match the boundary of one part of a serial Ramsar site, listed for manmade salt exploitation. The second part of the site is a freshwater lake some distance away, protected for wetland habitats and bird communities.

The Ramsar data file refers to nomination for EU Habitats Directive habitats and species, but the site has not yet been designated under this instrument.

The site's long standing function as a producer of salt from a natural source, seems to represent a sustainable use of natural resources.

The area around the site has been cleared and the vegetation is secondary scrub. The biodiversity interest on this site is in the number of halophilous and typically coastal species, and the presence of the Near Threatened damselfly (*Coenagrion mercuriale*), a special form of the brine shrimp (*Artemia parthenogenetica*), and nine locally rare plant species. The nomination recognises these values within the proposed protection and management system for the property.

#### References used

Ramsar (2002) Information sheet on Ramsar wetlands: Lago de Caicedo-Yuso y Salinas de Añana. ([http://sites.wetlands.org/reports/ris/3ES042EN\\_FORMER\\_2002.pdf](http://sites.wetlands.org/reports/ris/3ES042EN_FORMER_2002.pdf))

