



# IUCN World Heritage Evaluations 2016

IUCN Evaluations of nominations of natural and mixed properties to the World Heritage List

WHC/16/40.COM/INF.8B2



IUCN REPORT FOR THE WORLD HERITAGE COMMITTEE, 40TH SESSION, ISTANBUL, TURKEY, 10-20 JULY 2016



# 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		
Mexico	Archipiélago de Revillagigedo (1510)		yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	I
Chad	Ennedi Massif: natural and cultural landscape (1475)	Mixed site	part	–	part	–	no	no	no	–	no	no	no	yes	D
Iraq	The Ahwar of Southern Iraq: refuge of biodiversity and the relict landscape (1481)	Mixed site	–	–	part	part	part	part	part	part	no	no	no	yes	D
India	Khangchendzonga National Park (1513)	Mixed site	yes	–	–	yes	yes	yes	yes	–	yes	yes	yes	no	I
Canada	Pimachiowin Aki (1415 Rev)	Mixed site	–	–	yes	–	yes	yes	yes	–	yes	yes	yes	no	I

**KEYS**

yes met  
 part partially met  
 no not met  
 – not applicable

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

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## IUCN FIELD EVALUATORS

Site	Name
Mistaken Point	Mohd Shafeea Leman
Pimachiowin Aki	Bastian Bertzky
Ennedi Massif: natural and cultural landscape	Guy Debonnet
Hubei Shennongjia	Bruce Jefferies
Khangchendzonga National Park	Tilman Jaeger
Lut Desert	Paul Williams & Maher Mahjoub
The Ahwar of Southern Iraq: refuge of biodiversity and the relict landscape of the Mesopotamian Cities	Faisal Abu-Izzeddin
Western Tien-Shan	Elena Osipova & Kyung Sik Woo
Archipiélago de Revillagigedo	Wendy Strahm & German Soler
Virgin Komi Forests [Significant boundary modification]	Nikita Lopoukine
Western Caucasus [Significant boundary modification]	Carlo Ossola & Chimed Ochir Bazarsad
Mountain Ecosystems of Koytendag	Sarangoo Radnaaragchaa & Remco van Merm

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 2016

#### 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. This framework was updated and revised in 2015, and a revised process documented in Annex 6 of the Operational Guidelines, following discussion by the World Heritage Committee. 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 partner 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 2500 members, protected area managers and specialists from over 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, non-governmental organizations and scientific contacts in universities and other international agencies. This highlights the considerable "added value" from investing in the use of the extensive networks of IUCN and partner institutions.

These networks allow for the increasing involvement of regional natural heritage experts and broaden the capacity of IUCN with regard to its work under the World Heritage Convention. Reports from field missions and comments from a large number of external reviewers are comprehensively examined by the IUCN World Heritage Panel, as key inputs to each evaluation. The IUCN World Heritage Programme 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 continued to extend 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 was reported at the 40<sup>th</sup> Session of the World Heritage Committee last year, where IUCN and ICOMOS exchanged and coordinated their advice to the Committee, as also noted in the relevant specific reports.

IUCN has endeavoured wherever possible to work in the spirit of 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, specifically Annex 6 which spells out the evaluation process. 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 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 over 120 external reviews in relation to the properties examined in 2015 / 2016.

2. **Field Mission.** Missions involving one, or wherever possible two or more IUCN 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 July and October. 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). 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 has increasingly sought, over many years, 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. IUCN is available to respond to questions at any time, however, there are three occasions on which IUCN may formally 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 first meeting of the IUCN World Heritage Panel (December).** IUCN continues its practice of ongoing communicating with the nominating State Party/ies following its Panel meeting. In line with changes to Annex 6 of the Operational Guidelines this communication now comprises an interim report to the Parties on the status of the evaluation, sent by the end of January. If the Panel finds some questions are still unanswered or further issues need to be clarified, this letter may request supplementary information by a specific deadline. That deadline must be adhered to strictly in order to allow IUCN to complete its evaluation. In view of the importance of the requests for supplementary information, IUCN seeks to complete those at least one month before the requested deadline of 31<sup>st</sup> January, and in the present cycle all nominations where the IUCN Panel had questions, these were sent before the end of December 2015. It should be noted that in a number of cases the Panel may not have additional questions, but nevertheless dialogue is invited in all cases.

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. This has involved face to face meetings in Paris, and in IUCN's offices in Switzerland, and conference calls via Skype or dial-in conferences.

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.

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's range of thematic studies and key references that advise priorities on the World Heritage List are available at the following web address: [http://iucn.org/about/work/programmes/wcpa\\_worldheritage/publications/](http://iucn.org/about/work/programmes/wcpa_worldheritage/publications/).

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://iucn.org/about/work/programmes/wcpa\\_worldheritage/news/events\\_presentations2/worldheritage\\_2012\\_wcc.cfm](http://iucn.org/about/work/programmes/wcpa_worldheritage/news/events_presentations2/worldheritage_2012_wcc.cfm). 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 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 2013, IUCN 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. This material is all publicly available and posted online.

IUCN completed also in 2013 an evaluation of its World Heritage Programme, and a management response to its findings was agreed in 2014 and is being implemented. Following this, and consistent with discussions held at the World Heritage Committee, the implementation of revised working methods of the IUCN World Heritage Panel is being implemented in 2016. The evaluation and the management response are 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/).

The implementation of reform on IUCN's work on World Heritage is also integrating agreed actions arising from the work of the Ad-hoc Working Group of

States Parties, which has enabled valuable dialogue between States Parties and the Advisory Bodies, and also enabled IUCN and ICOMOS to consider a range of potential options to harmonise further their evaluation processes. IUCN welcomes this dialogue and considers the work of the Ad-hoc group provides a good model for possible continued dialogue towards effective new procedures for the evaluation process. IUCN notes that reform of the evaluation process is constrained fundamentally by the current calendar, and that many of the expectations of States Parties regarding increases in dialogue and transparency require more time to be provided for the evaluation, especially for nominations that are found to not meet requirements of the Operational Guidelines. In addition the implementation of the upstream process needs to be a central priority, and additional reflection on options, and additional resources will be required to enable it to be effective, equitable to States Parties, and appropriate in supporting a balanced and representative World Heritage List.

### 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 face to face 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 critically 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 independent, high quality scientific and technical advice to IUCN, which has the final responsibility for corporate recommendations made to the World Heritage Committee. Panel members agree to a code of conduct which ensures ethical behaviour and avoids any conflict of interest.

**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 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
- One Senior Advisor 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
- A representative of the IUCN Species Survival Commission (SSC) appointed on recommendation of the Chair, SSC
- The Head of the UNEP-WCMC Protected Areas Programme (from 2016 onwards this position will become an ex-officio advisor to the Panel, without a vote).
- Up to seven 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.
- As of 2016 one position for a specialist in geological heritage, appointed by IUCN following consultation with IUGS and the UNESCO Earth Sciences will be introduced.

The Panel's preparations and its meetings are facilitated through the work of the World Heritage Evaluations and Operations Officer. 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/advisory\\_body\\_role/world\\_heritage\\_panel/](http://www.iucn.org/about/work/programmes/wcpa_worldheritage/advisory_body_role/world_heritage_panel/).

A senior manager in IUCN (currently the IUCN Global Director, Biodiversity Conservation) 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. This role is currently fulfilled by the IUCN Global Thematic Director, Biodiversity Conservation.

#### **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

responsibility for IUCN's World Heritage work, other 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 2015 / 2016**

Nomination dossiers and minor boundary modifications examined by IUCN in the 2015 / 2016 cycle included:

- 8 natural property nominations (including 6 new nominations and 2 Significant Boundary Modifications);
- 4 mixed property nomination, where a joint mission was undertaken with ICOMOS;
- 3 cultural landscape nominations (all new nominations) and all were commented on by IUCN based on internal and external desktop reviews;
- 3 referred nominations;
- 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.

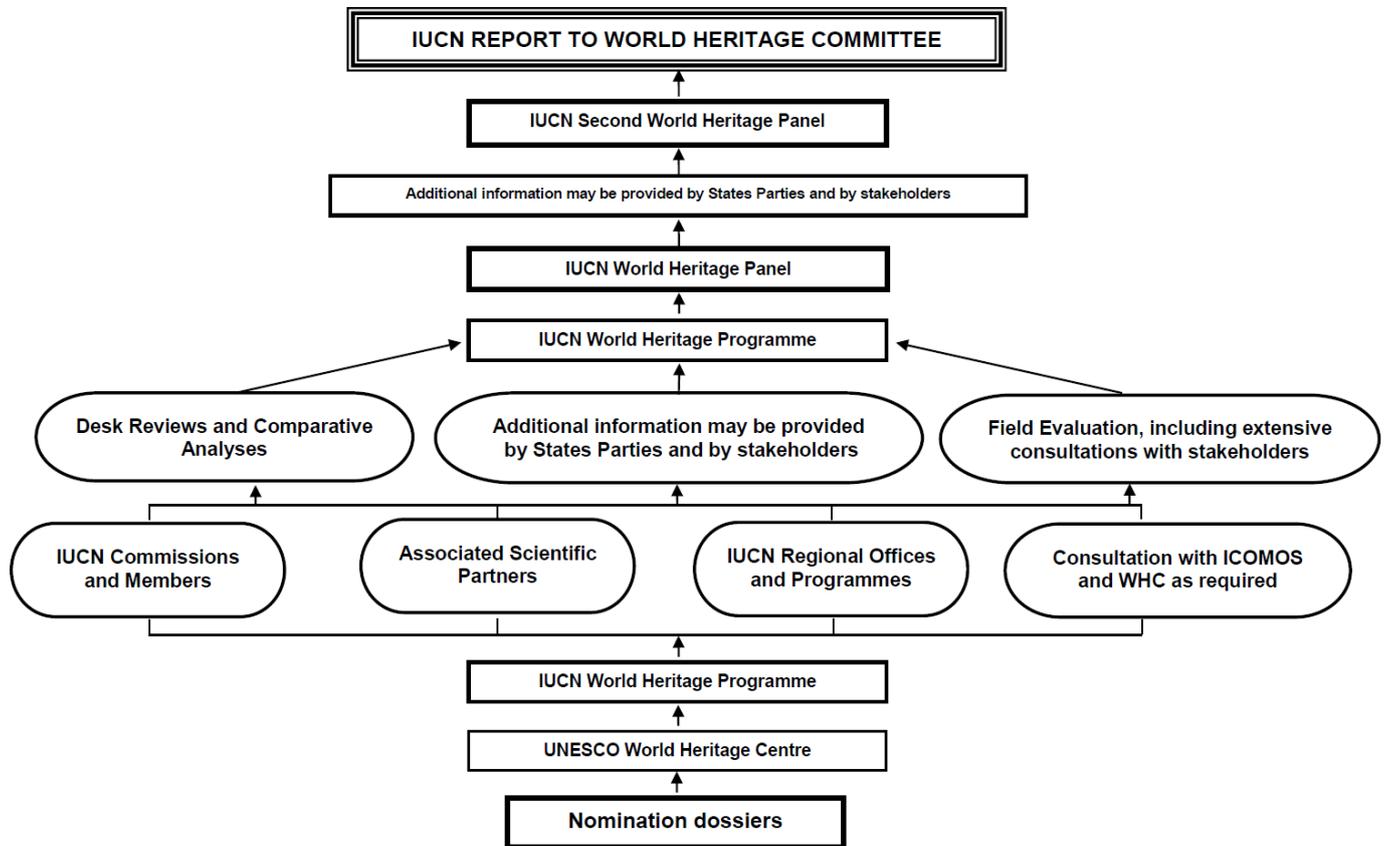
#### **7. RECOMMENDATIONS TO THE WORLD HERITAGE COMMITTEE**

In the 2015 / 2016 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 the provisions of the Operational Guidelines, and 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 29 February 2016, as evidenced by the postmark. IUCN has previously noted a number of points for improvement in the evaluation process, and especially to clarify the timelines involved.

## **8. ACKNOWLEDGEMENTS**

As in previous years, this report is a group product to which a vast number of people have contributed. Acknowledgements for advice received are due to the external evaluators and reviewers, many of them from IUCN's members, Commissions and Networks, and numerous IUCN staff at Headquarters and in IUCN's Regional and Country Offices. Many others contributed inputs during field missions. This support is acknowledged with deep gratitude.

Figure 1: IUCN Evaluation Process



## **A. NATURAL PROPERTIES**

### **A1. NEW NOMINATIONS OF NATURAL PROPERTIES**



**ASIA / PACIFIC**

## **HUBEI SHENNONGJIA**

**CHINA**



Laojunshan Component of the property - © IUCN Bruce Jefferies



# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## HUBEI SHENNONGJIA (CHINA) – ID 1509

**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:** 16 March 2015

**b) Additional information officially requested from and provided by the State Party:** On 6 September 2015, the State Party responded to issues which arose during the course of the IUCN field evaluation mission. The letter, with accompanying maps, addressed a range of issues and confirmed extensions to the nominated area and buffer zone in the Badong County area. Following the IUCN World Heritage Panel a progress report was sent to the State Party on 16 December 2015 seeking its response to specific proposals concerning connectivity conservation; coordination mechanisms; measures to manage anticipated increases in tourism; and future investment plans for the nominated property. The information in response was received from the State Party on 22 February 2016.

**c) Additional literature consulted:** Various sources including: BirdLife International (2015). *Important Bird Areas factsheet: Shennongjia Nature Reserve*. Downloaded from <http://www.birdlife.org> in October 2015. Xiang, Z., et al. (2011). *Does flagship species tourism benefit conservation? A case study of the golden snub-nosed monkey in Shennongjia National Nature Reserve*. Chinese Science Bulletin, 56(24): 2553–2558. Ying JS (2001). *Species diversity and distribution pattern of seed plants in China*. Biodiv Sci 9, 393–398 (in Chinese with an English abstract). Zhang, M., Xie, Z., Xiong, G. and Fan, D. (2009). *Structures and topographical pattern of the tree layer of Fagus engleriana-Cyclobalanopsis oxyodon community in Shennongjia area, Hubei Province, China*. Frontiers of Biology in China, 4(4): 503–512. Zhao, C.M., Chen, W.L., Tian, Z.Q. and Xie, Z.Q. (2005). *Altitudinal pattern of plant species diversity in Shennongjia Mountains, Central China*. Journal of Integrative Plant Biology, 47(12): 1431–1449. Askins, R. A., and Askins, R. (2014). *Saving the world's deciduous forests: ecological perspectives from East Asia, North America, and Europe*. Yale University Press. Chen Z, Yang J and Xie Z. (2005). *Economic development of local communities and biodiversity conservation: a case study from Shennongjia National Nature Reserve, China*. Biodiversity and Conservation 14: 2095–2108. Cowlishaw, G., & Dunbar, R. I. (2000). *Primate conservation biology*. University of Chicago Press. Hong-Wen, H., Oldfield,

S. and Hong Qian. *Global Significance of Plant Diversity in China*. In The Plants of China: A Companion to the Flora of China (2015). Huang, J. H., Chen, J.H., Ying, J.S., and Ke-Ping M. *Features and distribution patterns of Chinese endemic seed plant species*. Journal of Systematics and Evolution 49, no. 2 (2011): 81-94. Li, Y. (2004). *The effect of forest clear-cutting on habitat use in Sichuan snub-nosed monkey (Rhinopithecus roxellana) in Shennongjia Nature Reserve, China*. Primates 45.1 69-72.. López-Pujol, J., et al. (2011). *Mountains of Southern China as "plant museums" and "plant cradles": evolutionary and conservation insights*. Mountain Research and Development, 31(3), 261-269. Rodrigues, A. S., et al. (2004). *Global gap analysis: priority regions for expanding the global protected-area network*. BioScience, 54(12), 1092-1100. Shen, Z., Hu, H., Zhou, Y., & Fang, J. (2003). *Altitudinal patterns of plant species diversity on the southern slope of Mt. Shennongjia, Hubei, China*. Biodiversity science, 12(1), 99-107.

**d) Consultations:** 10 desk reviews received. The mission met with senior officials and representatives of the Ministry of Housing and Urban-Rural Development (MoHURD), the People's Government of Hubei Province and the Department of Housing and Urban-Rural Development of Hubei Province. Consultation occurred with staff of the Administration Bureau of Shennongjia National Nature Reserve and with scientists and other experts from various institutions/NGOs such as the Chinese Academy of Sciences, Northeast Forestry University and the Wildlife Conservation Society. In addition meetings were held with the Qingtian Village Committee and other local resident and business representatives.

**e) Field Visit:** Bruce Jefferies, 19 - 24 August, 2015

**f) Date of IUCN approval of this report:** April 2016

## 2. SUMMARY OF NATURAL VALUES

Located in Hubei Province within central-eastern China, the nominated property, Hubei Shennongjia, lies between the Daba and Wudang Mountains. The property is nominated as a serial site partitioned into two components: the Shennongding/Badong component lies to the west with the smaller Laojunshan component to the east. The two parts of the nomination are separated by a national highway

and an approximately 10 km wide corridor which is included in the buffer zone. Extensions to the originally nominated area and its buffer zone were advised by the State Party in supplementary information received in September 2015.

Hubei Shennongjia is located on the eastern edge of the second step of China's three step distribution of terrain and spans the watershed between the Yangtze and Han Rivers. Climatically, the nominated property coincides with a transition area between subtropical and warm temperate zones, where warm and cold air masses from north and south meet and are controlled by the distinctive subtropical gyre effect.

A mosaic of protected areas and designations exist in the Shennongjia area. The nominated area covers 73,318 ha and is coincident with the majority of the Shennongjia National Nature Reserve in Fang County and Shennongjia Forestry District. The larger Shennongding/Badong component in the west is 62,851 ha and now includes some 6,231 ha of the northern section of the Yanduhe Provincial Nature Reserve in adjoining Badong County. The nominated property also overlays a National Forest Park as well as a Biosphere Reserves and Global Geopark that are also nationally recognized protected areas. A buffer zone of some 41,536 ha surrounds the nominated area. The breakdown of areas for the nominated property is shown in Table 1.

Component	Component name	Area of component (ha)	Area of buffer zone (ha)
1	Shennongding/Badong (Shennongjia (56,620 + Badong 6,231))	62,851	41,536
2	Laojunshan	10,467	
	<b>TOTAL</b>	<b>73,318</b>	<b>41,536</b>

**Table 1:** Components and areas of the nominated property and buffer zone (as advised by the State Party, September 2015)

The nominated property has been relatively less affected by Quaternary glaciation than other areas in this region of China and is shaped by unique terrain and climate. These combine to make Hubei Shennongjia a distinctive habitat for numerous relic, rare, endangered and endemic species. The nominated property consists of mountainous terrain with an altitudinal range of nearly 2,700m and exhibits distinct vertical zones or altitudinal belts from the mountain tops to the foothills. Most of the mountains are above an altitude of 1,500m above sea level (asl), and 26 of them are above 2,500m, with six above 3,000m. Mt. Shennongjia, at 3,206m is the highest peak in central China and the surrounding terrain protects a diversity of karst and fluvial landforms with geomorphology derived from glacial and tectonic influences.

The region is considered to be one of three centres of biodiversity in China: the Hengduan; Southern China; and Central China (Shennongjia) regions. Located

within the Oriental Deciduous Forest biogeographical province, Hubei Shennongjia preserves several ancient and relic species and offers a record of the ecological and evolutionary processes of Central China's flora and fauna during the past 350 million years. The nominated property includes 13 types of vegetation and an intact altitudinal vegetation spectrum across six gradients including evergreen broad-leaved forest, mixed evergreen and deciduous broad-leaved forest, deciduous broad-leaved forest, mixed coniferous and broad-leaved forest, coniferous forest, and bush/meadow.

Shennongjia has been a place of significant scientific interest particularly for botanists and the mountains have featured prominently in the history of botanical inquiry. The site has been the object of celebrated international plant collecting expeditions conducted in the 19<sup>th</sup> and 20<sup>th</sup> Centuries. From 1884 to 1889 more than 500 new species were recorded from the area. Shennongjia is also the type location for many species and the subject of more than 620 scientific publications on its natural values. 3,644 vascular plant species have been recorded in the nominated property, an impressive 12.5% of China's total flora. China has the highest concentration of temperate plant genera in the world with nearly 931 genera. The nominated property protects 588 of these genera, a remarkable 63.2% of China's total temperate genera. The tree species and genus richness of the site is remarkable for a deciduous broadleaf forest type worldwide (838 species of deciduous woody plants, belonging to 245 genera). Furthermore the nominated property exhibits high levels of endemism within the plants. Totally, there are 205 species and 2 genera endemic to the nominated property, and 1,719 species endemic to China.

Hubei Shennongjia protects the largest primary forests remaining in Central China and provides habitat for many species of significant animals in the region. More than 600 vertebrate species have been recorded including 87 mammal, 389 bird, 46 fish, 51 reptile and 36 amphibian species. 4,300 insect species have been identified. The nominated property includes numerous rare and endangered species such as the Golden or Sichuan Snub-nosed Monkey (EN), Clouded Leopard (VU), Common Leopard (NT), Asian Golden Cat (NT), Dhole (EN), Asian Black Bear (VU), Indian Civet (LC), Musk Deer, Chinese Goral (VU) and Chinese Serow (NT), Golden Eagle (LC), Reeve's Pheasant (VU) and the world's largest amphibian the Chinese Giant Salamander (CR). The Golden or Sichuan Snub-nosed Monkey (*Rhinopithecus roxellana*) occurs in the provinces of Sichuan, Gansu, Shanxi, and Hubei. The animal is an emblematic species in China, considered as a national treasure of China in the same way as pandas.

The nominated property also contains high levels of globally threatened species. 105 plant species and 48 animal species are listed as endangered on the IUCN Red List and many species are recognised under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Totally, there are 205 species and 2 genera endemic to the nominated property, and 1,719 species endemic to China. High levels of globally threatened species are also present including 105 plant species listed on the IUCN Red List (2014). Among which, 7 species are termed CR, 33 species are EN, and 65 species are VU. 93 species are CITES listed.

### 3. COMPARISONS WITH OTHER AREAS

The nomination dossier includes a global comparative analysis which contrasts Hubei Shennongjia against selected World Heritage mountain sites. 65 mountainous sites are identified and these are further narrowed to 12 properties which are argued as corresponding to similar physical geographical features, biodiversity and ecosystems as Hubei Shennongjia. Other World Heritage mountain sites in tropical and frigid zones are thus not considered. The sites selected for comparison still include places with very varied biogeographical contexts and so some comparisons to Hubei Shennongjia are not immediately obvious. In these cases the conclusions reached sometimes appear erroneous.

More informative is the comparison made to sites in the same biogeographic province. Here the analysis is eventually filtered down to just two existing World Heritage sites: Mt Huangshan (China) and Shirakami-Sanchi (Japan). The analysis considers six other Tentative Listed properties in the Oriental Deciduous Forest biogeographic province but sites outside of this province are not assessed. Also located in the forested areas of central-eastern China, Mt Fanjingshan is less than 500 kms away in Guizhou Province and is on China's Tentative List, proposed for inscription under the same criteria (ix) and (x). Furthermore only World Heritage properties inscribed under criteria (ix) and (x) are considered whereas inscribed sites under natural criteria (vii) and (viii), including nearby sites on China, such as South China Karst, China Danxia and Mt Sanqingshan are not assessed despite these often possessing significant biodiversity values. The nomination's conclusions contend that Hubei Shennongjia is globally distinctive based upon its unique biodiversity, biogeographical flora, altitudinal natural belts, and ecological and biological processes.

To supplement the nomination's analysis, further detailed assessment undertaken by IUCN and UNEP-WCMC has considered a range of other comparable sites based on biogeography and global priorities. The resulting analysis backs the claims made within the nomination based on analysis of the spatial data and references within the academic literature. In addition a number of expert global reviewers also support and expand, via cited references, on the claims made in the nomination.

Concerning criterion (ix) the nominated property is situated in the Daba Mountains Evergreen Forests ecoregion which is not yet represented on the World Heritage list. Hubei Shennongjia represents evergreen and deciduous broad-leaved mixed forest in the northern hemisphere. Mt. Shennongjia is the highest

peak in central China and offers examples of typical mountain altitudinal biological zones in the Oriental Deciduous Forest biogeographical province. The nominated property is widely considered among botanists and plant ecologists to contain the best developed altitudinal vegetation belts found among the world's deciduous broad-leaved mixed forest mountain systems. Shennongjia is also located within a priority ecoregion, the Southwest China Temperate Forest, which is not yet represented on the World Heritage list. WWF notes that the forests within this ecoregion support one of the richest arrays of temperate plant species in the world and provide a home to a number of globally important species including many found within the nominated property such as Clouded Leopard (VU), Chinese Muntjac (LC) and China's Giant Salamander (CR).

For criterion (x) WCMC found that Hubei Shennongjia coincides with an area of considerable global plant biodiversity. The specific natural conditions present at the nominated property have contributed to the conservation of a large number of ancient plants that originated in the tertiary period, including remarkably high numbers of endemic plants when compared to other sites. 205 species and 2 genera are endemic to the nominated property, and 1,719 species are endemic to China. Among the flora 105 plant species are considered globally threatened and 93 species are CITES listed. The property also provides critical habitat for a number of animal species characteristic of this biogeographic province, including endemic and threatened species such as the Sichuan Snub-nosed Monkey (of which a population of 1,200 has been recorded within the property), Clouded Leopard, Asian Black Bear, Forest Musk Deer and Chinese Giant Salamander.

The property exhibits comparatively high levels of species richness when measured against 16 other natural World Heritage and tentatively listed sites. This is especially evident among vascular plants, where Hubei Shennongjia contains an exceptional 63.2% of the temperate genera found across all of China, a megabiodiverse country with the world's greatest diversity of temperate plant genera. The property protects the largest primary forests in Central China and, whilst covering less than 0.01% of China, contains an impressive 12.5% of the country's vascular plant species. As noted above the nominated property exhibits unparalleled tree species and genus richness for a deciduous broadleaf forest type worldwide. Although the Oriental Deciduous Forest province is one of the better represented Udvardy provinces on the World Heritage List, the Shennongjia regional Centre of Plant Diversity has been mentioned in IUCN's 2000 global study as a gap in representation of global biodiversity on the World Heritage List.

In summary, based on additional research which has augmented the comparative analysis within the nomination dossier, IUCN concludes that in the final analysis the nominated property meets the necessary level of global significance to satisfy the requirements of Outstanding Universal Value.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

The nominated property is all state-owned land. The two components of the property: Shennongding/Badong and the smaller Laojunshan area to the east are both protected within the Shennongjia National Nature Reserve. The extension to the nominated area in the south is protected within the Yanduhe Provincial Nature Reserve in adjoining Badong County.

A wide range of national, provincial and county level laws and regulations affords protection to Hubei Shennongjia and the nominated area is coincident with several other protective designations at national and international level (National Forest Park, global and national level Biosphere Reserves and Geoparks). A buffer zone has been delineated surrounding the property, some of which is included with Shennongjia Nature Reserve and some within Yanduhe Nature Reserve. Some parts of the buffer zone lie within the Global Geopark and other parts are outside the mosaic of formally protected designations.

Public access and use of the nominated area is legally prohibited. Uses are subject to permit and restricted to scientific research, monitoring and management. Nevertheless, as is common in many of China's Nature Reserves, some resident populations exist within the site and zoning systems permit some degree of access for appreciation and education as well as more sophisticated infrastructure in the zones known as "Exhibition Districts".

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

### 4.2 Boundaries

The boundaries of the nominated area are clearly defined and for the most part encompass the necessary attributes of Outstanding Universal Value. Boundaries have taken into account natural features such as watershed margins and ridges. The addition of areas in the Badong County to the south have significantly improved the integrity of the site and made for a more rational design including a buffer zone which now fully surrounds the property. The 6,231 ha addition covers and elevation range from 700 to 2,900m and adds 36 species to the initial area proposed for nomination. The addition protects a further distinct population of Golden Snub-nosed Monkeys and thus preserves the full habitat range of known populations in Shennongjia.

A key concern regarding the boundaries is the loss of ecological connectivity across the 10km corridor which separates the two component parts of the nominated property and is the location of the arterial road (Highway 209). The road is fenced on both sides and thus impedes some animal movements. Future development in this area could result in increasing pressure to upgrade this road thus further fragmenting

the site. IUCN raised significant concerns about this matter, and particularly with respect to the values associated with criterion (ix), noting that the two components, whilst in good condition, are relatively small and do not represent a cohesive conservation unit. The field evaluation noted the intervening corridor areas have varying degrees of degradation however there may be options to create corridors, stepping stones (arrays of small patches of habitat that provide shelter, feeding and resting refuges for individual animals) or other connectivity mechanisms. In supplementary information the State Party has assessed the feasibility of, and committed to establishing enhanced ecological connectivity between the Shennongding/Badong component in the west and the Laojunshan component in the east. Details are provided on a series of connectivity initiatives that would significantly improve the ecological integrity of the property for many of the endangered animal species such as Clouded Leopard, Asian Black Bear, Forest Musk Deer and Chinese Goral which have large ranges and require sizable well-connected areas to ensure the viability of populations.

These proposals will be implemented over the next three years and recognize that much of the now buffer zone between the two components has good forest cover (95-97% in many areas). Proposals include the establishment of two wildlife corridors totaling over 8,700 ha; establishing 11 wildlife crossings (an additional 4 on top of 7 already established); a system of stepping stone sites; and the dismantling of roadside fencing along 30% of the road system. IUCN appreciates the responsiveness of the State Party on these proposals which will enhance the value of the property for key species. The State Party is encouraged to further elaborate the connectivity measures by tailoring management prescriptions to the needs of specific wildlife species ensuring the connectivity strategy is monitored, adaptive and effective in the long-term. Environmental impact assessment should be carried out for the road wildlife crossings and environmental rehabilitation implemented as appropriate in both the corridors and stepping stones. The State Party is further encouraged in time to elevate the protection status of the corridor and stepping stone areas in view of their importance to the ecology of the system. Careful attention will be needed to minimize human-wildlife conflicts in the corridor zones and stepping stones and monitoring programmes should be introduced to assess the utility of these measures.

IUCN considers that the boundaries of the nominated property, including the additional area added during the nomination, meet the requirements of the Operational Guidelines.

### 4.3 Management

Hubei Shennongjia is comprised of a mosaic of protected areas overlain with other protective designations and the IUCN evaluation has raised with the State Party a range of issues regarding the need to strengthen significantly the integration of management across various areas and disciplines. Institutionally, a

4-tier management structure has been put in place and is considered to be appropriate and well supported at the different levels it represents. The administrative authorities of the different protected areas in the nominated property will be responsible for management under the control of the MoHURD at national level. In its supplementary information the State Party has noted that upon inscription an “Integrated Protection and Management Committee of Hubei Shennongjia World Natural Heritage” will be established to strengthen the comprehensive management of the nominated property as a whole including the added sections in Badong County. The multi-agency governance structure is appropriate and in general there is good support and cooperation evident from all levels of Government. An important area to be addressed in the 4-tier management structure is the lack of formal recognition of stakeholder groups that are outside the government structure. This includes communities, emerging non-government organisations (NGO) and other stakeholders and interest groups. The State Party has indicated its commitment to co-management with concerned communities and will establish an integrated mechanism of heritage conservation and community development for the property.

The nominated property is covered by a management plan prepared at the time of the nomination and responding to issues specific to World Heritage. The nomination dossier also makes reference to a number of other planning documents including the Master Plan of Shennongjia National Nature Reserve (2005-2014); Master Plan of the Shennongjia Forest Park; Plan of Shennongjia National Geopark in Hubei Province (2011-2030); and the Master Plan of Tourism of Hubei. At present the management of the site is somewhat fragmented and lacking cohesiveness, however the management plan if implemented in an integrated way provides an acceptable blueprint for the future protection of the site.

The management zoning system presented in the nominated property is somewhat ambiguous. The nomination dossier makes reference to a range of ecological zones, however, only two “formal” zones are legally possible. The “Prohibited and Limited District” zone includes areas of high conservation value where use is focused on science and teaching. Here low key facilities are permitted and sightseeing, scientific education and scientific tourism presentation are partly allowed. The “Exhibition District” provides for more developed infrastructure and service facilities for tourism. The majority of the nominated area is zoned “Prohibited and Limited District” (97.7%) which provides for a high level of protection and the Exhibition District is restricted to an area adjoining Highway 209. Overlaying this are proposals within the management plan for a system of “Conservation Stations and Points” which appear to be operational areas; however they have stated objectives which target the needs of certain species. The “Conservation Stations and Points” system above provides a more nuanced level of management which is welcomed, however it is not clear how this relates to the formal zoning system. IUCN recommends that the zoning

system be reviewed to ensure it is unambiguous, values-based, driven by clear species relevant objectives and harmonized with laws and regulations.

At a field/operational level, management is divided into three levels: Administration Bureau, Conservation Station, and Conservation Point. The staffing structure and capacity are considered satisfactory and the property reports a total of 215 full-time personnel, 93 of which are administrative and professional technical staff, 80% of whom have tertiary qualifications. Staff expertise covers a wide range including: physical geography, geology, environmental protection engineering, administration, botany, zoology, planning, national park and garden management, GIS, tourism management, forestry, water conservation and hydrological engineering and finance and accounting.

Funding is provided through Government appropriations and appears to be stable. This area of Hubei Province has suffered from changes in the local economy, including due to the decline of commercial forestry. There is a clear commitment from the Central Government to invest in conservation and tourism futures for the region. Supplementary information has detailed an impressive 3-year investment strategy which will increase annual resourcing by 20%. A substantial CNY 45 million (USD 6.9m) p.a. has been pledged for the property to support a range of management needs including significant investment in community development and in the Badong County addition to the nominated area. Staffing levels will be increased by 75% by 2018 from the current 93 staff to 163.

Whilst stressing the need for more integrated approaches to management, IUCN considers the management of the nominated property meets the requirements of the Operational Guidelines.

#### 4.4 Community

The nominated property has a long history of human occupation and utilisation supported by archaeological evidence. Today some 7,000 residents live within the nominated area and a similar number in the buffer zone. The nomination and management plan emphasize the buffer zones as transition areas essential to the maintenance of the integrity of the ecosystem, biodiversity and natural landscape of the nominated property. Management is focused on controlling the size and scope of development and uses. Proposed interventions include impact mitigation, ecological restoration, soil erosion control and environmental remediation. The IUCN mission drew attention to shortcomings in management capacity related to the buffer zone.

There are programmes noted in the nomination to relocate people from within the more environmentally sensitive nominated area. Tujia, Miao, and Dong ethnic minority groups are noted from the region however there are no details on specific programmes related to different ethnic groups. IUCN’s position on the relocation of communities from protected areas or for other purposes is in line with a number of

international rights-based agreements such as International Labour Office (ILO) Convention 169 and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). Although this is not considered an ideal practice or the first or only option, it remains a legitimate option under certain conditions. IUCN note five essential conditions that should be met for any relocation: 1) no forced relocation; 2) relocation should be properly justified; 3) all communities concerned should agree in full to the relocation and its conditions, through proper consultative and fair process; 4) the communities should be better off after the relocation, more secure; and 5) all the above should be demonstrable, transparent, and accountable.

IUCN has not received concerns about any relocation practices, but the evaluation mission was only able to make a superficial assessment that residents appear to be provided with reasonable education and health services and that relocated families from the property appear to be being provided with accommodation and funds for resettlement. IUCN considers that the State Party should be requested to ensure that any relocation activities respect fully international norms, and to not undertake any further relocation unless it is fully justified.

Some consultation has occurred with local people and there appears to be general support for the nomination. A survey of communities in and around the nominated property was undertaken in 2014 and revealed that most of the respondents (98%) thought it was important to protect the nominated property. However, only 302 resident of the total affected population were surveyed. IUCN notes the need to improve a generally weak engagement of local people in management and decision-making.

#### 4.5 Threats

The mission did not observe or have reported to it any indications that there were adverse effects from development within the two components which make up the nominated area and the forest condition within these areas is considered good. Some areas of the buffer zone are, however, significantly modified and include several villages and towns. Agricultural and tourism development within the buffer zone is also prominent and unsympathetic to wider landscape values. Some encroachment into forest areas for gathering wood and tea cultivation has been reported.

The road corridor (National Road 209) is currently the most significant threat to the ecological functionality of the nominated property as it splits the system into two. The extent of wildlife movement between different components is unknown, however the road is fenced on both sides and the lower reaches of the valley have been subject to disturbance which would impede the passage of wildlife. In this regard the commitments of the State Party to implement a connectivity strategy are welcome.

Hubei Shennongjia currently receives approximately 500,000 visitors p.a. with potential to significantly

increase should the site be inscribed. The Shennongjia Airport opened in May 2014 and lies only 7-8 kms north of the site. The airport is designed to handle 250,000 visitors annually by 2020 and has markedly opened up access to this area which has traditionally been quite isolated. Experience elsewhere shows that the development of enhanced transport infrastructure has a flow on effect creating opportunities for additional development which can be a positive but also create negative impacts. Additional information indicates the incoming traffic from this new airport has not reached forecasts and has not had a significant impact on the visitation. Furthermore, even at maximum capacity the anticipated numbers of additional tourists arriving by air would be in the order of 80,000 p.a. and not exceed the carrying capacity of the property. Most of the nominated property has a Tourism Master Plan written in 2006 and due for renewal as it expired in 2015. The State Party has indicated this plan will be reviewed in 2016 to account for any anticipated spike in interest in Hubei Shennongjia if inscribed. Despite this, careful monitoring and management will be needed to manage tourism impact which has been reported to generate an average 14% increase in use for Chinese sites following inscription.

Other threats to the property appear to be currently low and the legal protective regime appropriate to dealing with them. Threats from poaching/hunting and illegal harvesting are not currently significant. There is no mining within the nominated property with only small scale quarrying restricted to roadside gravel extraction in the buffer zone. Grazing is also restricted to buffer zone areas.

IUCN concludes that the threats to this property are not currently significant and the nominated areas are reported to be in good condition. The main threats stem from the potential for increased tourism, impact of the corridor and the road acting as a barrier to animal movements.

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

## 5. ADDITIONAL COMMENTS

### 5.1 Justification to serial approach

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

**a) What is the justification for the serial approach?**  
Hubei Shennongjia is presented as a serial configuration in two components separated by a corridor within the buffer zone. For criterion (ix) IUCN considers the serial approach is not optimal on the basis of the attributes which express the property's significant values. Separate component parts do not address the integrity of potential Outstanding Universal Value. The new conservation connectivity measures detailed by the State Party in supplementary information provide assurances that ecosystem

function and habitat continuity will be greatly enhanced. The good conservation condition of areas within this corridor suggest they should receive additional legal protection and be added to the nominated area in due course.

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

The two components of the nominated property lie within the same mountain system and are only 10 km apart on average so they are functionally connected within the same biogeographical context. As noted above a serial approach based on distinct and complementary values of the two components is not optimal, and thus the provision of increased connectivity is essential for integrity concerns to be addressed. The two components are not sampling different aspects of the values, rather they share common values. A contiguous or well-connected site would be a preferable configuration.

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

The two component parts will be subject to the overarching 4-tier administrative structure for the nominated property. Each protected area will be managed by its respective legal authority with coordination via the "Integrated Protection and Management Committee" noted above. The nominated property is subject to a common management plan, however, there is a need to revise the plan to incorporate the recently added extensions within Yanduhe Provincial Nature Reserve in Badong County.

## 6. APPLICATION OF CRITERIA

**Hubei Shennongjia** has been nominated under natural criteria (ix) and (x).

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

Hubei Shennongjia protects the largest primary forests in Central China and is one of three centres of biodiversity in China. The property includes 13 types of vegetation and an intact altitudinal vegetation spectrum across six gradients including evergreen broad-leaved forest, mixed evergreen and deciduous broad-leaved forest, deciduous broad-leaved forest, mixed coniferous and broad-leaved forest, coniferous forest, and bush/meadow. With 838 species of deciduous woody plants, belonging to 245 genera, the tree species and genus richness of the site is unparalleled for a deciduous broadleaf forest type worldwide and within the Northern Hemisphere's evergreen and deciduous broad-leaved mixed forests, Hubei Shennongjia contains the most complete altitudinal natural belts in the world. Hubei Shennongjia is situated in the Daba Mountains Evergreen Forests ecoregion and also within a priority ecoregion, the Southwest China Temperate Forest, both of which are not yet represented on the World Heritage List. It also protects the Shennongjia regional centre of plant

diversity which has been identified as a gap on the World Heritage List. In association with its floral diversity the property protects critical ecosystems for numerous rare and endangered animal species.

IUCN considers that the extended property as nominated meets this criterion.

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

Hubei Shennongjia's unique terrain and climate has been relatively less affected by glaciation and thus creates a haven for numerous rare, endangered and endemic species, as well as many of the world's deciduous woody species. The property exhibits comparably high levels of species richness, especially among vascular plants, and remarkably contains more than 63% of the temperate genera found across all of China, a mega biodiverse country with the world's greatest diversity of temperate plant genera. The property, whilst covering less than 0.01% of China, contains 12.5% of the country's vascular plant species. The mountainous terrain also contains critical habitat for a range of flagship animal species. 1,200 Golden or Sichuan Snub-nosed Monkeys are recorded in the property. The Golden Snub-nosed Monkeys in Shennongjia are the most endangered of the 3 sub-species in China and are entirely restricted to the property. Other important species include Clouded Leopard, Common Leopard, Asian Golden Cat, Dhole, Asian Black Bear, Indian Civet, Musk Deer, Chinese Goral and Chinese Serow, Golden Eagle, Reeve's Pheasant and the world's largest amphibian the Chinese Giant Salamander. The property has extremely rich biodiversity, contains a large number of type species, and hosts numerous rare species which have been introduced into horticulture worldwide. Internationally, Shennongjia holds a special place for the study of plant systematics and horticultural science.

IUCN considers that the extended property as nominated meets this criterion.

## 7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC/16/40.COM/8B and WHC/16/40.COM/INF.8B2;
2. Inscribes Hubei Shennongjia (China) on the World Heritage List under natural criteria (ix) and (x);
3. Adopts the following Statement of Outstanding Universal Value:

**Brief synthesis**

*Hubei Shennongjia is located in the Shennongjia Forestry District in China's Hubei Province. Shennongjia is on the ecotone from the plains and foothill regions of eastern China to the mountainous region of central China. It is also situated along a zone*

of climate transition, where the climate shifts from the subtropical zone to warm temperate zone, and where warm and cold air masses from north and south meet and are controlled by the Subtropical Gyre.

The property covers 73,318 ha and consists of two components, the larger Shennongding/Badong component in the west and the smaller Laojunshan component to the east. A buffer zone of 41,536 ha surrounds the property. Hubei Shennongjia includes 13 types of vegetation which are characterized by a diversity of altitudinal gradients. The Shennongjia region is considered to be one of three centres of biodiversity in China, a reflection of its geographical transitional position which has shaped its biodiversity, ecosystems and biological evolution. Hubei Shennongjia exhibits globally impressive levels of species richness and endemism especially within its flora. 3,644 vascular plant species have been recorded including a remarkable 588 temperate plant genera. In addition 205 plant species and 2 genera endemic to the nominated property, and 1,719 species endemic to China. Among the fauna, more than 600 vertebrate species have been recorded including 87 mammal, 389 bird, 46 fish, 51 reptile and 36 amphibian species. 4,300 insect species have been identified. The nominated property includes numerous rare and endangered species such as the Golden or Sichuan Snub-nosed Monkey, Clouded Leopard, Common Leopard, Asian Golden Cat, Dhole, Asian Black Bear, Indian Civet, Musk Deer, Chinese Goral and Chinese Serow, Golden Eagle, Reeve's Pheasant and the world's largest amphibian the Chinese Giant Salamander.

Shennongjia has been a place of significant scientific interest and its mountains have featured prominently in the history of botanical inquiry. The site has a special status for botany and has been the object of celebrated international plant collecting expeditions conducted in the 19<sup>th</sup> and 20<sup>th</sup> Centuries. From 1884 to 1889 more than 500 new species were recorded from the area. Shennongjia is also the global type location for many species.

## Criteria

### Criterion (ix)

Hubei Shennongjia protects the largest primary forests in Central China and is one of three centres of biodiversity in China. The property includes 13 types of vegetation and an intact altitudinal vegetation spectrum across six gradients including evergreen broad-leaved forest, mixed evergreen and deciduous broad-leaved forest, deciduous broad-leaved forest, mixed coniferous and broad-leaved forest, coniferous forest, and bush/meadow. With 838 species of deciduous woody plants, belonging to 245 genera, the tree species and genus richness of the site is unparalleled for a deciduous broadleaf forest type worldwide and within the Northern Hemisphere's evergreen and deciduous broad-leaved mixed forests, Hubei Shennongjia contains the most complete altitudinal natural belts in the world. Hubei Shennongjia is situated in the Daba Mountains Evergreen Forests ecoregion and also within a priority ecoregion, the Southwest China Temperate Forest both of which are

not yet represented on the World Heritage List. It also protects the Shennongjia regional centre of plant diversity which has been identified as a gap on the World Heritage List. In association with its floral diversity the property protects critical ecosystems for numerous rare and endangered animal species.

### Criterion (x)

Hubei Shennongjia's unique terrain and climate has been relatively little affected by glaciation and thus creates a haven for numerous rare, endangered and endemic species, as well as many of the world's deciduous woody species. The property exhibits high levels of species richness, especially among vascular plants, and remarkably contains more than 63% of the temperate genera found across all of China, a megabiodiverse country with the world's greatest diversity of temperate plant genera. The property includes 12.5% of the country's vascular plant species. The mountainous terrain also contains critical habitat for a range of flagship animal species. 1,200 Golden or Sichuan Snub nosed Monkeys are recorded in the property. The Golden Snub-nosed Monkeys in Shennongjia are the most endangered of the 3 sub-species in China and are entirely restricted to the property. Other important species include Clouded Leopard, Common Leopard, Asian Golden Cat, Dhole, Asian Black Bear, Indian Civet, Musk Deer, Chinese Goral, Chinese Serow, Golden Eagle, Reeve's Pheasant and the world's largest amphibian the Chinese Giant Salamander. The property has extremely rich biodiversity, contains a large number of type species, and hosts numerous rare species which have been introduced into horticulture worldwide. Internationally, Shennongjia holds a special place for the study of plant systematics and horticultural science.

### Integrity

The property covers 73,318 ha and is coincident with the majority of the Shennongjia National Nature Reserve in Fang County and Shennongjia Forestry District. The larger Shennongding/Badong component in the west is 62,851 ha and includes the northern section of the Yanduhe Provincial Nature Reserve in adjoining Badong County. The Laojunshan component at 10,467 ha lies in the east. A buffer zone of 41,536 ha surrounds the property. The property is large enough to encompass all the essential components that form the unique biodiversity, biological and ecological values of the Shennongjia in Hubei. The boundaries are designated and clearly demarcated on the ground.

The property remains in good condition and threats are generally not of significant concern. However, the division of the site by National Highway 209 and the associated 10 km wide corridor is a cause for concern as it impedes wildlife movements and ecological connectivity. The implementation of an effective conservation connectivity strategy involving wildlife corridors, stepping stones or arrays of small patches of habitat, wildlife road crossings and the removal of fences is therefore essential to facilitate ecological connectivity for mobile wildlife, especially those species which normally require sizable habitat ranges.

### **Protection and Management requirements**

*All of the property is owned by the state and has national or provincial protection status. Hubei Shennongjia is subject to a range of national, provincial and local laws and regulations which ensure long term strict protection. A multi-level management system has been established to manage the nominated property. The nominated property is subject to a number of plans and has a specific Hubei Shennongjia Management Plan tailored to World Heritage requirements and aimed at safeguarding the site's Outstanding Universal Value. The management plan needs to be updated to cover management of the Yanduhe Provincial Nature Reserve in Badong County. The management plan should in addition elaborate on measures to integrate different areas of management expertise in a coordinated way across the different protected areas and other national and international designations. The management plan should be a forward-thinking tool that supports adaptive management. Zoning systems should be reviewed to account for the specific habitat and spatial needs of key species.*

*The property enjoys widespread support among all levels of Government, local people and other stakeholders. The property requires long-term, active management of the buffer zone to ensure that any developments are of an appropriate scale and design which is in keeping with the values of the site. Furthermore that surrounding landuses are sympathetic and local communities benefit from the World Heritage status of the property. Increased attention and capacity is needed to manage issues within the buffer zone.*

*A concern stems from the potential of tourism use at the property to increase significantly. Significant improvements to transport infrastructure, most notably the opening of the nearby Shennongjia Airport in 2014, has the potential to dramatically increase visitation and consequent impact. Tourism planning, management and monitoring need to anticipate increasing demand and mitigate negative impacts.*

*Other threats relate to buffer zone developments and activities. Developments and encroaching landuse such as for tea cultivation need ongoing monitoring. Attention should be given to integrated conservation and community development initiatives in the buffer zones to foster stronger community stewardship of the World Heritage property.*

4. Commends the State Party for its efforts to improve the conservation of the property and in particular its

expeditious actions to expand the property in the Badong County area and implement a range of ecological connectivity measures to improve integrity during the evaluation process;

5. Notes that the State Party indicates that relocation of people from the property is encouraged by the Integrated Protection and Management Committee, and that such relocation from the World Heritage property is a sensitive matter and requests the State Party to ensure that any relocation activities are voluntary and fully respect international norms. Further relocation activities should not be undertaken unless they are fully justified;

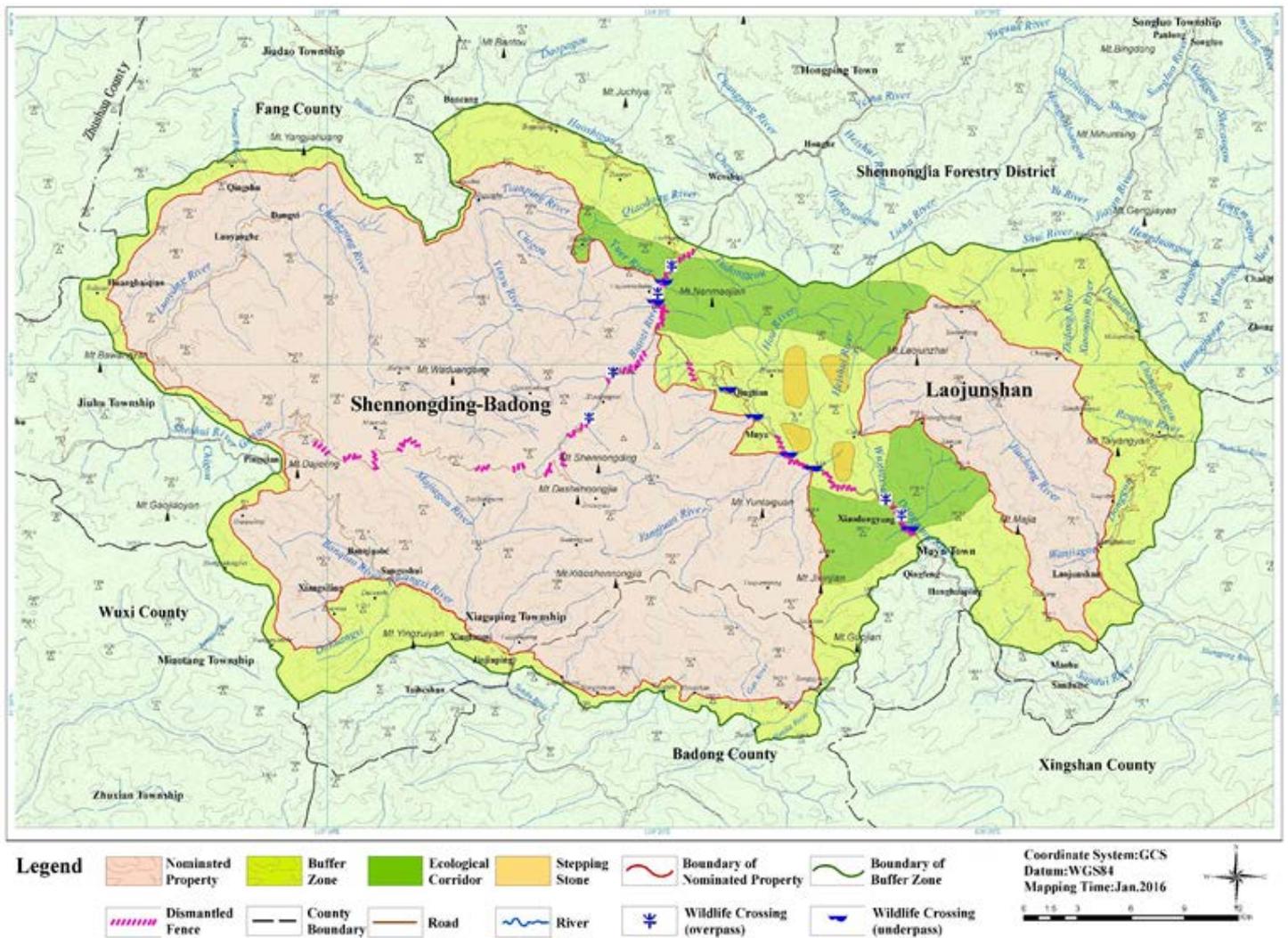
6. Requests the State Party to:

- a) continue to enhance ecological connectivity between the core habitat areas of the property through a range of measures such as wildlife crossings, corridors and habitat mosaics which facilitate wildlife movements and to ensure that management prescriptions are tailored to the specific needs of key wildlife;
- b) upgrade the legal protection to nature reserve standard of wildlife corridor and habitat stepping stone areas which are crucial to the property's ecological integrity and consider nominating these as future extensions to the property;
- c) review the management planning system for the property to fully encompass the new areas added to the property, as well as the functioning of the buffer zones, and ensure an integrated and adaptive approach for the entire property;
- d) update the 2006-2015 Tourism Master Plan to ensure long-term and effective management of the anticipated increases in tourism demand, in particular to specify ecological and social carrying capacities and identify appropriate tourism infrastructure development;
- e) invest further in increased management capacity directed to the property's buffer zone, with a particular emphasis on integrating cultural, social economic and co-management opportunities into the properties management regime;
- f) undertake further research and inventory of key faunal populations including for example a population census of both the flagship species Golden Snub-nosed Monkey and the Giant Salamander;
- g) undertake a review of the property's zoning system to prescribe management policies and actions tailored to the habitat and spatial needs of key species.

**Map 1:** Location of the nominated property in China



**Map 2:** Nominated property (2 components) and buffer zone



**ASIA / PACIFIC**

## **LUT DESERT**

**ISLAMIC REPUBLIC OF IRAN**



Large kaluts and yardangs - © IUCN Paul Williams



# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## LUT DESERT (ISLAMIC REPUBLIC OF IRAN) – ID 1505

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** To refer the nomination under natural criteria.

**Key paragraphs of Operational Guidelines:**

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

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

### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 16 March 2015

**b) Additional information officially requested from and provided by the State Party:** Following the IUCN World Heritage Panel a progress report was sent to the State Party on 16 December 2015. The letter advised on the status of the evaluation process and sought responses/clarifications on a range of issues including management measures to deal with visitor access, specifically threats from vehicles, tourism and sporting events; clarification of the role of the nominated property's steering committee; updated information on funding for the site; and knowledge of the biodiversity values of the site and how these will be managed. The State Party was asked to confirm that mining, oil and gas exploration and extraction is, and will continue to be prohibited within the nominated property, noting reports of a major iron ore deposit within the Lut Desert. Lastly the State Party was asked to consider boundary modifications to exclude the villages and roads on the western side of the property. An additional point of clarification on the status of the site management plan was sought by way of IUCN letter dated 27 January 2016. The information in response was received from the State Party on 23 February 2016.

**c) Additional literature consulted:** Various sources including: Gabriel, A. 1938. *The southern Lut and Iranian Baluchistan*. Geographical Journal 92, 192-210. Cooke, R., Warren, A., Goudie, A. (1993). *Desert Geomorphology*. UCL Press, London. Goudie, A. S. (2002). *Great Warm Deserts of the World*. Oxford University Press, Oxford. Goudie, A. S. (2007). *Mega-yardangs: a global analysis*. Geography Compass 1/1, 65-81. Goudie, A. and Seely, M. (2001). *World Heritage Desert Landscapes: Potential Priorities for the Recognition of Desert Landscapes and Geomorphological Sites on the World Heritage List*. Gland, Switzerland: IUCN. 44pp. Mildrexler, D.J., Zhao, M., Running, S.W. (2011). *Satellite finds highest land skin temperatures on Earth*. Bulletin American Meteorological Society, 855-860. DOI:10.1175/2011BAMS3067.1 Aghanabati, A. (2004). *Geology of Iran*. Geological Survey of Iran, Tehran. Amrikazemi, A. and Mehrpooya, A. (2006) *Geotourism Resources of Iran*. In: Dowling, R.K. and Newsome, D., Eds., *Geotourism*, Burlington (Elsevier Butterworth-Heinemann), Oxford, 79-89. Moatamed, A. (1973) *Lut*

*Hole Geological Issues*. Journal of Geographical Reports. Tehran University, Tehran, 11. Stocklin, Y. (1973) *Basic Geological Study of Central Lut, East of Iran*. Report 22-F, Institute of Geology and Mining Publications, Tehran. Yazdi, A., Emami, M.H. and Shafiee, S.M. (2014) *Dasht-e Lut in Iran, the Most Complete Collection of Beautiful Geomorphological Phenomena of Desert*. Open Journal of Geology, 4, 249-261. <http://dx.doi.org/10.4236/ojg.2014.46019> Yazdi, A. (2012) *A study of Iran's Lut desert: Geomorphological and Geotourism attractiveness*. Geological and Earth Sciences, [http://dx.doi.org/10.5176/2251-3361\\_GEOS12.27](http://dx.doi.org/10.5176/2251-3361_GEOS12.27)

**d) Consultations:** 11 desk reviews received. The mission also met with representatives of the senior staff from central and local levels of the Iranian Cultural Heritage, Handicraft, Tourism Organization, and from Iran's Environment Department. The mission also consulted widely with staff of the management bases of Lut Desert; Governors and officials of cities and villages around the property. During the mission, three meetings were held with governors and local representatives at Kerman, Shahdad and Nehbandan, as well as meetings with local communities in Shafiabadi, Dehsalm, Heydarabad, Nosratabad and Chahhossein Ali.

**e) Field Visit:** Paul Williams and Maher Mahjoub, 20-26 October 2015

**f) Date of IUCN approval of this report:** April 2016

### 2. SUMMARY OF NATURAL VALUES

The nominated property Lut Desert is in the southeast of the Islamic Republic of Iran (hereinafter referred to as Iran) and straddles the three Iranian Provinces of Kermān, Sistāno Balūchestān and Khorāsān-e Jonūbi. It is an arid continental subtropical area notable for a rich variety of spectacular desert landforms. At 2,278,015 ha the nominated area is large and is surrounded by a buffer zone of 1,794,134 ha which varies in width between 10 and 30 kms.

In Persian language "Lut" refers to bare land without water and devoid of vegetation. The Lut Desert is situated in an interior basin surrounded by mountains, so it is in a rain shadow and, coupled with high temperatures, the climate is hyper-arid. The region often experiences Earth's highest land surface

temperatures: a temperature of 70.7C has been recorded within the nominated property.

The regional topography results in the nominated area being a focus for internal drainage that collects and evaporates in a salt plain (that has sometimes been a playa lake) at 117 m above sea-level. The largest incoming river, the Rud-e Shur, drains a catchment to the north of the nominated area. It is perennial but highly saline by the time it enters the core zone; so its banks are devoid of riparian vegetation and its channel is lined with salt crystals. The Fahraj is the major river catchment draining in from the south with an intermittent flow.

A steep north-south pressure gradient develops across the region in spring and summer with the result that strong NNW-SSE winds blow across the nominated area from between June and October each year. The long duration strong winds propel 1 mm quartz sand grains at great velocity creating transportation of sediment and aeolian erosion (by sand blasting) on a colossal scale. Consequently, the area possesses what many experts consider the world's best examples of aeolian *yardang* landforms, as well as extensive stony deserts and dune fields. Yardangs are bedrock features carved and streamlined by sandblasting, although they are also eroded by gullying from rainfall runoff and by mass movement. Some are also undercut by floodwaters. Yardangs appear as massive and dramatic corrugations across the landscape with ridges and corridors oriented parallel to the dominant prevailing wind. The ridges are known as *kaluts*. In the Lut Desert some are up to 155 m high and their ridges can be followed for more than 40 km. Yardangs cover about one third of the nominated area and are developed in consolidated lacustrine sediments (sands, silts, marls, evaporites) of mainly Plio-Pleistocene age that accumulated on the floor of the inland basin.

The wind also strips hard rocky outcrops bare of soil, which leaves extensive stony desert pavements (*hamada*) with sand-blasted faceted stones (*ventifacts*) across about 12% of the nominated area. An extensive, black stony desert covers the basaltic Gandom Beryan plateau in the northwest of the core zone. The stony deserts in eastern Lut cover (as a rubbly veneer) extensive pediplains, which are rock platforms that truncate bedrock and gently slope away from the foot of neighbouring hills.

Sands transported by wind and washed in by intermittent streams have accumulated in the south and east, where huge sand-seas (termed *rig* or *erg*) have formed across 40% of the core zone. These areas consist of active dunes some reaching heights of 475 m. These are amongst the largest dunes in the world and are displayed in the Lut Desert in a wide variety of forms, including linear, compound crescentic, star, and funnel shaped. Where sands are trapped around the lee of plants at the slightly wetter margins of the basin, *nebkhas* form to 12 m or more in height, arguably being the highest in the world. Nebkhas cover about 3% of the area, particularly along its western margin.

Large coalescing alluvial fans (*bajada*) and gullied badlands surround much of the Lut basin with their headwater apices in the buffer zone or beyond. The nominated property boundary tends to follow the distal margins of the fans as they grade into the basin and only small fans around isolated hills in eastern Lut are included in the nominated area. Ephemeral streams from fans transport sediment and solutes into the basin. Dissolved minerals evaporated from incoming streams result in white efflorescences of crystals and evaporite crusts down river beds, in yardang corridors and in salt pans (*playa*). A variety of small scale evaporite landforms develop, especially along the edges of the Shur River where white crystalline pools are a widespread feature. Small landforms result from the pressure effects of crystal growth, including salt polygons, tepee fractured salt crusts, small salt *pingos* (or blisters), salt karren and gypsum domes. Various salt features are found over about 4% of the nominated area, especially in the playa of Shurgaz-e Hamun.

Although not nominated for its biodiversity values, the Lut Desert is known to possess natural values that result from the ecological and biological processes which evolved in parallel with the development of the desert ecosystem. The region has been described in the past as a place of 'no life' and information on the biological resources in this area is limited. Nevertheless the nomination dossier documents the area's known flora and fauna including an interesting adapted insect fauna and other species which have made their home in this extreme environment. Supplementary information provided by the State Party confirms that no comprehensive study of biodiversity in the region has been undertaken, however, there are plans outlined in the management plan to further investigate this aspect of the property.

Within the nominated area, only the western edge includes settlements (there being 28 villages, the largest with just over 700 people). In the buffer zone there are 15 villages and Shahdad town with a population of nearly 6,000. The region has evidence for habitation going back 7,000 years, however this has always been around the periphery of the nominated area, because the aridity of the core zone rendered most of it uninhabitable.

### 3. COMPARISONS WITH OTHER AREAS

The nomination dossier presents a reasonably comprehensive and convincing comparative analysis of key landforms such as sand dunes, yardangs/kaluts and nebkhas and objectively assesses the relative values of Lut Desert against a number of logical sites both in Iran and around the world. The Lut Desert is compared with several other desert landscapes sites in Iran and internationally with the Namib Sand Sea (Namibia), Grand Canyon National Park (USA), Wadi Rum Protected Area (Jordan), Uluru-Kata Tjuta National Park (Australia) and Air and Ténéré Natural Reserves in Niger. This analysis is particularly relevant to criterion (vii) and concludes that the nominated property exhibits a range of desert landforms and

associated processes that exceed other places in extent, scale of features and diversity.

However the dossier's analysis of key aspects of earth history pertinent to criterion (viii) values has some shortcomings. Under (viii) the nominated property is ultimately only compared to Willandra Lakes in Australia and the Namib Sand Sea in Namibia. The analysis concludes that only the Namib Sand Sea is seen as comparable on the basis of its extent, the variation in desert geomorphology and fact that it is the only World Heritage site containing yardangs. The nomination concludes that what makes Lut Desert more striking relative to the Namib Sand Sea is its greater diversity of landforms including the highest nebkhas, the highest and longest yardangs, and the highest sand dunes of the world as well as the hottest spot on earth.

Further comparative analysis has been undertaken through the evaluation and with the support of expert reviewers. Hot to warm deserts are unevenly researched because of their hostile environments, although some have been studied in detail, especially in parts of Africa, the Americas and Australia. Less work has been done on deserts in the Middle East and Central and Southern Asia. So within the limits of readily available information, the comparative analysis was considered accurate, complete in most key areas and reasonably comprehensive. One landform, *pediments*, and where they merge as compound features, *pediplains*, received little attention in the dossier. They are not visually dramatic, because they form very extensive almost flat gently sloping desert plains, usually covered by a stony veneer. However, pediplains cover large areas of the buffer zone and are usually found where there is *hamada* (stony desert). Pediments and pediplains are common in most arid to semi-arid landscapes, and those at Lut are considered to be only of regional significance. Similarly comparative information on evaporite landforms such as playas with abandoned salt lake shorelines and other salt features suggests these too are of regional significance.

Parts of the Western Desert of Egypt/Libya display a mix of dunes and yardangs, but they are not as impressive as those of the Lut. The yardangs of high altitude areas in South America also probably deserve conservation, but they occur in very different materials (ignimbrites) and in a very different climatic environment. They do not occur in association with major dunes. The Dunhuang yardangs of China may be the closest in terms of beauty, size and extent.

Noteworthy is the dossier's strong reference to IUCN's 2011 Desert Study which concludes that the Lut Desert ranks as one of the world's most important deserts. This global thematic study comprehensively assessed non-polar deserts around the world to identify places with World Heritage potential concluding that the Lut Desert was one of only six deserts recommended as areas of high potential for listing. The rationale being that the Lut contains some of the largest and best developed yardangs found anywhere on earth. Some of the ridges exceed 60m in

height and run parallel, with superbly developed aeolian streamlining. The study goes on to note that the Lut Desert contains the longest system of yardangs; tallest sand pyramid; hottest point; and biggest nebkhas in the world.

To sum up, many experts consider that the Lut Desert contains the biggest and most perfectly shaped yardangs in the world. They are impressive in terms of their extent (70 x 160 km), spacing and height (up to 155m). The property also contains some very impressive dunes, which are among the very highest in the world, and nebkhas of unusual size. One of the virtues of the nominated property is that it contains both aeolian erosional and aeolian depositional features in close juxtaposition. It is also notable from the climatic point of view, possessing some of the highest desert temperatures ever recorded. There are large yardangs in other parts of the world (e.g. Dunhuang in China and Borkou in the Sahara) but the Lut examples are superb, and no existing World Heritage site has comparably excellent examples. The dunes are not quite so important, but only the Namib Sand Sea contains anything comparable.

It is important to note that a majority of expert reviewers, including from the International Union of Geological Sciences, consider on the basis of global comparisons that the Lut Desert meets criteria (vii) and (viii), although a number noted concerns with management and conservation issues, especially relative to tourism and potential for mining. In summary IUCN considers that the nomination demonstrates the exceptional importance of the values of the property, providing a strong basis for considering the site meets criteria of Outstanding Universal Value.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

Due to its remoteness from major population centres and its extreme environmental conditions, including extreme heat and lack of water, much of the Lut Desert has been largely inaccessible and therefore naturally protected. The nomination reports that, apart from some small private landholdings in villages in the nominated area and buffer zone of western Lut, the majority of the land within the Lut Desert is state-owned. The nominated property is subject to a complex and multi-level protection regime and a range of legislation, regulations and protective mechanisms apply (14 legal instruments). Legal protection and management is provided by state level authorities that work under their specific mandates. Three agencies principally share conservation and management responsibility for the nominated property, namely the Forests, Range and Watershed Management Organization; Iranian Department of Environment; and the Iran Cultural Heritage, Handicrafts and Tourism Organization (ICHHTO).

Protection of non-conservation lands, study and execution of projects of watershed and rangeland management and desertification is under the control of

the Organization of Forests, Range and Watershed Management. This agency is responsible for the prevention of illegal exploitation of deserts. Two protected areas located in the northwest and southeast are under the management and protection of the Iranian Department of Environment. The Darband-e Ravar “wildlife refuge” in the northwest partially overlaps with the nominated area but the Bobolab “no hunting” area in the southeast only overlaps with the buffer zone. In addition to management of the protected area, the Department of Environment is responsible for environmental assessment of development projects. The Lut Desert is also on the national heritage registration list of ICHHTO. The ICHHTO is responsible for the management of tourism, cultural heritage and buffer zone regulation and control.

IUCN’s field evaluation, as well as a number of expert reviewers, raised concerns regarding which agency has the overriding prevailing authority for the management of the nominated property. The nomination states that “all the government states in charge of conservation including Forests, Rangeland, and Watershed Management Organization, Iranian Department of Environment and Iran Cultural Heritage, Handicrafts and Tourism Organization are responsible for management and protection of these natural regions.” Whilst an inter-agency Steering Committee has been established, it is not clear which agency legally has final authority over the site. Additional information provided by the State Party reinforces the strategic importance of this Steering Committee noting that only activities with the approval of this Committee can occur. The response is still ambiguous although it implies that the ICHHTO acts as the lead agency on the Steering Committee, managing the committee, defining its terms and acting on behalf of the State Party. IUCN remains concerned that the multi-agency mandate for the property creates potential weaknesses with respect to reconciling conflicting approaches. This is exacerbated by the rather shallow management plan currently in place for the nominated property (see 4.3 below). The property would thus benefit from a much clearer articulation of accountability and ultimate management authority for the Lut Desert in its entirety.

In conclusion IUCN considers that whilst the legal protective framework is very complex and might benefit from rationalization, it is currently adequate to safeguard the scenic, geomorphological and geological values of the nominated property. The complex set of laws and regulations when taken together appear to be relatively strong in the above areas, however they are considered unlikely to be sufficient for the biodiversity and ecological aspects of the site. The two protected areas which are under the control of the Department of Environment are established to protect biodiversity yet only cover a very small percentage of the nominated area.

Despite concerns regarding the complexity of legal protection and a lack of clarity over which agency is the prevailing management authority, IUCN considers

that the protection status of the nominated extended property meets the requirements of the Operational Guidelines.

## 4.2 Boundaries

The nominated property is of a significant size and the site’s boundaries have been drawn to include most of the key scenic, geomorphological and geological values. With respect to both criteria (vii) and (viii), all elements and processes are present in order to express the property’s Outstanding Universal Value. The property has a very high degree of integrity, has suffered very few adverse effects, and is unlikely to experience significant adverse effects in the foreseeable future. The large nominated area completely encloses the key landforms: the major yardang field, the sand-sea complexes, extensive hamada, pediplains and salt pans (playa).

IUCN is concerned that the boundary includes a number of areas which in IUCN’s opinion do not add attributes of value and/or detract from the integrity of the site due to the inclusion of degraded areas, developed village areas and associated infrastructure such as roads. The boundary of the nominated area in the northwest, in particular, has been drawn to include a number of villages on the outskirts of Shadad and Anduhjerd. The boundary also incorporates the area of the Gandom Beryan Plateau, a basaltic feature which is not of global significance and does not relate the Lut Desert’s principal geomorphological aeolian features. In response to IUCN’s request to consider amending the boundary in this part of the property, the State Party indicated it would like to retain the boundary because “separation of the villages from the property may weaken the conservation tradition and weaken the participation of local communities in conservation” and for management efficiency (road systems servicing management research and visitors). IUCN is of the view that the conservation tradition could be maintained through other measures than including degraded areas and urban areas in the property (for instance by recognising those areas as buffer zones), and that fundamentally these areas both detract from the integrity of the property, and create unnecessary conservation issues for the remainder of the substantially uninhabited landscape, and potentially for the communities themselves. IUCN further notes that the centres of Shahdad, Dehsalm and Nosratabad from which park activities are organised are outside of the nominated area, yet clearly are connected to and benefit from the park and its activities. IUCN recommends a review of the boundary in this part of the property and would be willing to work closely with the State Party to consider amendments to strengthen the design of the site.

IUCN considers that the boundaries of the nominated property do not fully meet the requirements of the Operational Guidelines, and that developed and degraded areas should not be included within its boundaries.

### 4.3 Management

The complexity of the Lut Desert's legal protection framework mirrors that of its governance arrangements. Conservation and management of the nominated area and its buffer zone is complex and falls under the responsibility of three agencies, the Iranian Department of Environment, the Cultural Heritage, Handicrafts, and Tourism Organization, and Organization of Forests, Range and Watershed Management.

The site is managed from a headquarters, the "Base of the Lut Desert" located at Shafiabad, on the western margin of the protected site. Housed in the Lut Desert Base is the Steering Committee referred to above and established to coordinate and oversee the activities of the three responsible agencies and their staff. The Steering Committee includes representatives of the state departments, provinces, rural and city councils, tourism agencies and the scientific community and its composition plays a key role in achieving integrated management at a local level. Whilst the supplementary information has provided some additional clarity on the governance arrangements these would nevertheless benefit from greater transparency regarding decision making, accountability and the sharing of power among agencies and other actors.

There are a number of contextual plans on deserts and tourism development however these apply to desert systems across Iran as a whole. For example a 2014 project concentrated upon tourism planning for arid areas in Iran with only some focus on tourism routes in the Lut. IUCN also notes that the ICHHTO has traditionally handled matters related to Iran's cultural heritage and has been responsible for the country's existing 19 cultural World Heritage properties. The Lut Desert is nominated as Iran's first natural nomination and the evaluation mission considered that the needs of natural heritage management are not yet well understood in Iran. The mission witnessed a strong will and considerable latent capacity in Iran to manage natural properties, but concluded that at present the institutional framework is sub-optimal for achieving this.

Only a summary of the content within the management plan was outlined in the nomination dossier including management goals, management strategies and action plans centred on research and education, conservation and tourism. IUCN requested more information and in response the State Party provided a stand-alone management plan (prepared in 2016). This plan of 32 pages is very short and, whilst going into some additional detail, still only provides a bare outline of short (2 years), medium (5 years) and long term (up to 10 years) action plans for the property, with many actions described in just one line. Much greater clarity is needed on the analysis of threats and measures to address these; articulation of coordination arrangements; more nuanced actions to spell out exactly what will be done; and the specification of timeframes, estimated budgets and responsible agencies for implementation.

Some 20 staff from the various agencies operate from Lut Desert Base at Shafiabad and an additional eight staff at the Lut Desert Base at Dehsalm in the north. A third base has recently been established at Nosratabad in the southeast of the property. Pressures on the site are currently low and large areas of the interior are difficult to access and inhospitable; regardless, this level of staffing is modest for a property of this size with its extensive boundary and buffer zone being areas requiring an active management presence.

Information was limited in the nomination dossier on the available finances for the Lut Desert; however, some additional information has been provided by the State Party. Funding comes from government appropriations: national, provincial and local as well as income generated from tourism and public use. Finances are derived from the independent budgets of the three responsible agencies. Adequate funding totalling USD 3 million was made available to the site in 2015 increasing to USD 4 million in 2016; however, there are no details on the breakdown of this funding for capital versus recurrent expenditures nor any guarantee of continuity and ongoing adjustment for inflation.

The management plan for this nominated property is inadequate and IUCN considers the management of the nominated property does not meet the requirements of the Operational Guidelines.

### 4.4 Community

As noted above, 28 villages are currently included in the western part of the nominated property. These villages have a total population of 6,177; and there are two small towns (largest is Shahdad with a population of 5,942) and 15 villages in the buffer zone with a total population of 12,961. In general, with less than 20,000 people occupying an area of over 4 million ha the area is sparsely populated. Thus, outside of these developed areas and their immediate surroundings, human impact pressures are low, confined to a relatively small area, and are currently mainly associated with visitors. Impacts associated with vehicles extend well into parts of the nominated property. Tourist infrastructure development is confined mainly to existing settlements in the buffer zone, although Dehseyf Camp is located inside the nominated area. A few pilot ecolodges managed by local people, two of them in the village Shafiabad, were initiated recently by the ICHHTO.

Local communities are given grazing rights in some parts of the buffer zone and, although the vegetation cover is sparse, this practice is unlikely to damage the property. Occupation of the land follows very long established traditional rights and practices centred on livestock grazing in nebkha areas. As noted above in some areas such practices have caused degradation. Traditional water resources harvesting, known as the "qanat system", still exists within the buffer zone and to a less extent the core, and is a matter of attention by the government in order to protect and restore some of

the qanats (qanats are man-made water harvesting conduits, accessed through wells, and dug as tunnels at the level of the water-table).

The evaluation mission reported a high level of support and commitment for Lut Desert conservation and sustainable use based on interactions with the public and civil society organizations. There appeared to be a good partnership between political authorities and local people and they are regularly involved in decision making processes. Local/rural council members are included on the steering committee, a positive initiative to maintain consultation opportunities with local peoples.

#### 4.5 Threats

Low population density, extreme environmental conditions, remote location and lack of development impacts have helped maintain the Lut Desert in relatively pristine condition. Nevertheless there are a number of more notable threats that require careful and increased attention. Tourism presents the greatest current and potential threat with unregulated off road driving by tour operators, construction of illegal campsites, and self-guided tourists causing vegetation and landform damage and also threatening the integrity of the site. Associated with tourism activity and in particular off road driving is the promotion and execution of desert rallies. Eleven tourist companies operate in the area and require formal permits to do so. Annual visitation has gradually increased with some 77 000 visitors in 2013, just over 3% being international. World Heritage recognition and easing of international geopolitical tension will undoubtedly bring more international visitors to Iran.

The State Party has indicated in its supplementary information that tourism activity is restricted to the peripheries of the site and focused in eight tourism development areas. Access to the interior of the property is strictly controlled and only researchers are permitted to enter. Desert rallies are not permitted within the nominated area by virtue of the management plan. Whilst the management plan provides some guidance on the management of tourism, it is lacking in detail and does not provide a cohesive vision on how the tourism potential of the Lut will be managed. Apart from policing use, the plan does not specify other measures which will be implemented to manage vehicle access impacts. IUCN welcomes the proposals to manage tourism impact, however remains concerned about the adequacy of measures to control demand and use especially in the nominated properties peripheries.

Local people gather firewood and carry out some limited grazing. Monitoring of this should continue in order to ensure the use remains at sustainable levels. As noted above some developed and impacted areas are included within the nominated area. Destruction/removal of vegetation on nebkhas by local residents in some locations threatens natural geomorphic processes.

The State Party has stated categorically that no mining exploitation will be permitted within the nominated area or buffer zone. There are mines located in the region but these are reported as being outside of the nominated property and some distance from it so unlikely to create adverse impact.

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

### 5. ADDITIONAL COMMENTS

As noted above the Lut Desert region has locally been regarded as a 'no life zone', which is clearly incorrect as is evident from the section on biology in the dossier. IUCN notes the very hot, hyper-arid Lut Desert may be thought of as a climatically extreme 'pole' of life on earth so its biological community and biological processes may be of global significance, even though they may not be visually spectacular. The unspoilt nature of the area also suggests that they will be intact. Therefore, IUCN considers that the area may be internationally important for biodiversity and recommends further assessment of the biological and ecological values within the nominated property.

### 6. APPLICATION OF CRITERIA

The **Lut Desert** has been nominated under natural criteria (vii) and (viii).

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

The Lut Desert protects a globally recognized iconic hot desert landscape, one of the hottest places on earth. It is renowned for its spectacular series of landforms namely the yardangs (massive corrugated ridges) in the west of the property and the sand sea in the east. The yardangs are so large and impressive that they can be seen easily from space. Lut is particularly significant for the great variety of desert landform types found in a relatively small area. Key attributes of the aesthetic values of the unspoilt property relate to the diversity and sheer scale of its landforms; a visually stunning mosaic of desert colours; and uninterrupted vistas across huge and varied dune system that transition into large flat desert pavement areas.

IUCN considers that the large majority of the nominated property meets this criterion, but some areas that clearly do not are also included within its boundaries.

#### **Criterion (viii): Earth history and geological processes**

The property represents an exceptional example of ongoing geological processes related to erosional and depositional features in a hot desert. The yardang/kalut landforms are widely considered the best-expressed in the world in terms of extent, unbroken continuity and height. The Lut sand-seas are amongst the best developed active dune fields in the

world, displaying a wide variety of dune types (crescentic ridges, star dunes, complex linear dunes, funnel-shaped dunes) with dunes amongst the highest observed anywhere on our planet. Nebkha dune fields (dunes formed around plants) are widespread with those at Lut as high as any measured elsewhere. Evaporite (salt) landforms are displayed in wide variety, including white salt-crusts crystalline riverbeds, salt pans (playa) with polygonally fractured crusts, pressure-induced tepee-fractured salt crusts, gypsum domes, small salt pingos (or blisters), and salt karren. Other dry-land landforms include extensive hamada (stony desert pavements or reg) usually located on pediment surfaces with wind faceted stones (ventifacts), gullied badlands and alluvial fans (bajada).

IUCN considers that the large majority of the nominated property meets this criterion, but some areas that clearly do not are also included within its boundaries.

## 7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC/16/40.COM/8B and WHC/16/40.COM/INF.8B2,

2. Refers the nomination of the **Lut Desert (Islamic Republic of Iran)** in relation to natural criteria, taking note of the strong potential for this property to meet criteria (vii) and (viii), in order to allow the State Party, with the input of IUCN if requested, to:

- a) review the boundary of the nominated property to exclude inappropriate degraded areas and developed and settled areas in the north west from the property, but include them in a Buffer Zone, in order to ensure that the design of nominated property includes all the relevant attributes contributing to Outstanding Universal Value;
- b) revise and elaborate the recently completed initial management plan for the nominated property to improve the level of detail, and to clearly state a set of time-bound management actions for the property;
- c) further clarify and detail the role and function of the property's Steering Committee in particular to unambiguously identify which agency holds the ultimate accountability for the management of the property.

3. Recommends the State Party to:

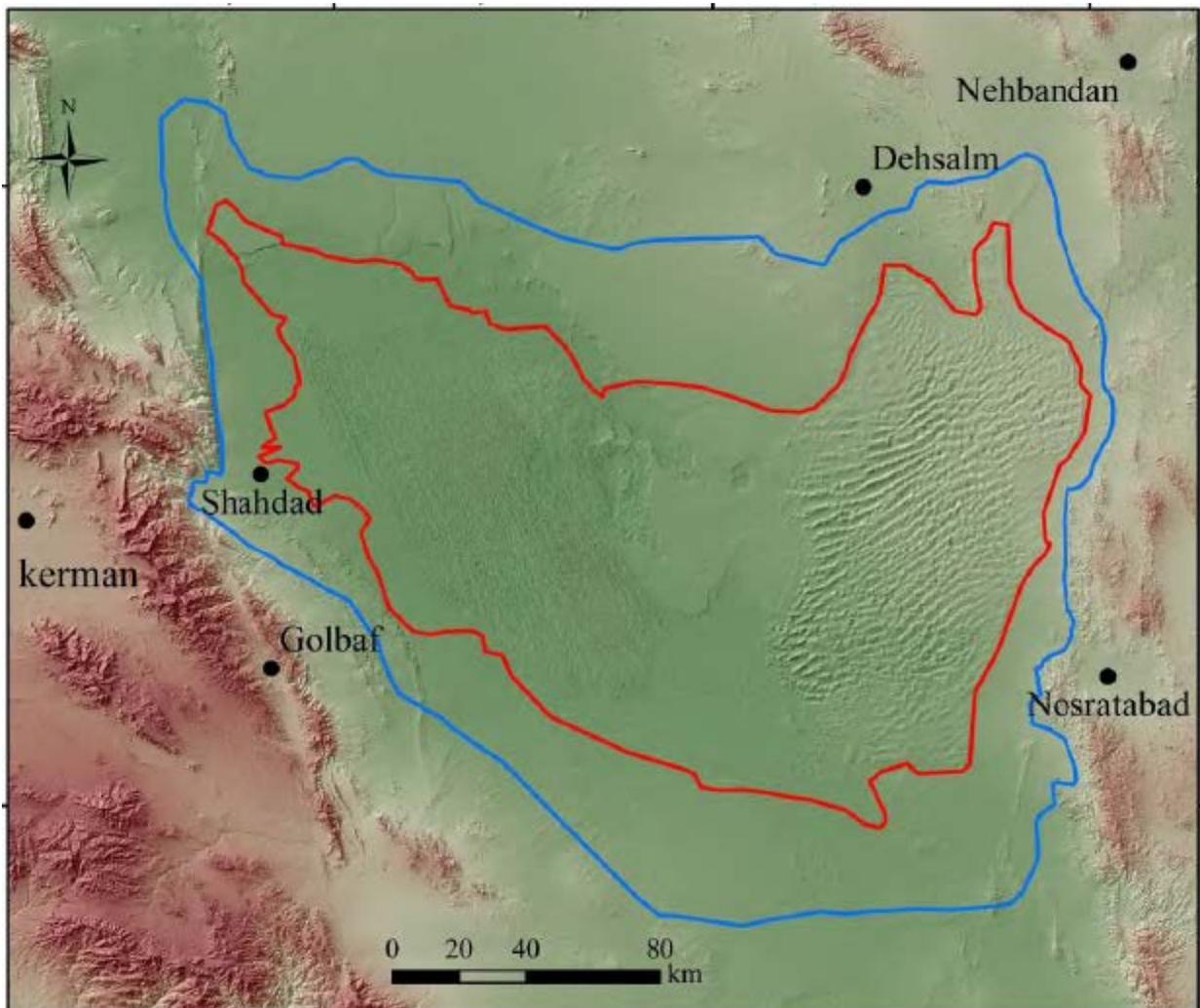
- a) progressively build technical capacity to manage the natural values of the Lut Desert in light of the intrinsic links between the property's geomorphology, geology and its desert adapted biodiversity and ecology; and
- b) further study and assess the biodiversity and ecological values of the nominated property with a view to considering nomination also under (ix) and/or (x) at some future time.

4. Welcomes the efforts of the State Party of the Islamic Republic of Iran and its partners to nominate the country's first natural World Heritage property.

**Map 1:** Location of the nominated property in Iran



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



**ASIA / PACIFIC**

## **WESTERN TIEN-SHAN**

**KAZAKHSTAN, KYRGYZSTAN, UZBEKISTAN**



Aksu-Jabagly State Nature Reserve, Kazakstan - © IUCN Elena Osipova



# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## WESTERN TIEN-SHAN (KAZAKHSTAN, KYRGYZSTAN, UZBEKISTAN) – ID 1490

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

### Key paragraphs of Operational Guidelines:

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

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

**Background note:** This property has not previously been nominated, however the Committee's attention is drawn to Decision 37 COM 8B.10 on the inscription of Xinjiang Tianshan, China which *inter alia* requested the State Party of China to "initiate collaboration with neighbouring countries to explore the potential for a transnational serial nomination". IUCN notes the willingness of the State Parties of Kazakhstan, Kyrgyzstan and Uzbekistan, as expressed in letter of 12 June 2013, to work collaboratively with China on transboundary aspects of the Tianshan Mountain Range which straddles all four countries. Please note that the Tianshan has different spellings in different countries.

## 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 16 March 2015

**b) Additional information officially requested from and provided by the States Parties:** On 16 December 2015, following the IUCN World Heritage Panel, a progress report was sent to the States Parties noting that the nomination as configured had a wide range of deficiencies and did not appear to meet the requirements of the Operational Guidelines. Specifically, concerns related to the natural criteria not being demonstrably met across all components; inadequate justification of the serial approach; questions regarding integrity, protection and management across all components; and the lack of evidence of an effective overall protection and management system across the serial property. IUCN highlighted the significant work needed to revise the nomination and offered to work with the States Parties to better understand the comparative values of the nomination at the scale of the Tien-Shan Range; to determine the most appropriate configuration; and to develop a fully integrated and effective management system for the entire property. Subsequently a skype call was convened to discuss the report, but due to technical issues, only representatives of Kazakhstan were able to join that call. Information in response to IUCN's progress report was received on 26 February 2016 and is discussed below.

**c) Additional literature consulted:** Various sources including: Dingwall, P., Weighell, T. and Badman, T., 2005, Geological World Heritage: *A global framework, A contribution to the global theme study of World Heritage Natural sites*, IUCN, 51p. Orlovskaya, E. R., 1966, *Pervyy Paleontologicheskij zapovednik*. V sb. Trudy zapovednika Aksu-Dzhabagly. Vyp. 7. Wells, R. T., *Earth's geological history, A contextual framework for assessment of World Heritage fossil site nominations*, IUCN Working Paper 1, 43p. BirdLife International (2015a) *Important Bird Areas factsheet:*

*Aksu-Dzhabagly State Nature Reserve*. Downloaded from <http://www.birdlife.org>, accessed in October 2015. BirdLife International (2015b) *Important Bird Areas factsheet: Kenshektau Mountains*. Downloaded from <http://www.birdlife.org>, accessed in October 2015. BirdLife International (2015c) *Important Bird Areas factsheet: Bashkizylsay Unit of the Chatkal Mountains Biosphere Reserve*. Downloaded from <http://www.birdlife.org>, accessed in October 2015. Critical Ecosystem Partnership Fund (CEPF) 2015. *Biodiversity hotspots: Mountains of Central Asia*. Downloaded from <http://www.cepf.net/resources/hotspots>, accessed in October 2015. Dzhangaliev, A.D., Salova, T.N. and Turekhanova, P.M. 2003. *The wild fruit and nut plants of Kazakhstan*. Farrington, J. D. 2005. *A Report on Protected Areas, Biodiversity, and Conservation in the Kyrgyzstan Tian Shan with Brief Notes on the Kyrgyzstan Pamir-Alai and the Tian Shan Mountains of Kazakhstan, Uzbekistan, and China*. Bishkek: U.S. Fulbright Program, Environmental Studies Section. Footitt, R.G. & Alder, P.H. (2009). *Insect Biodiversity: Science and Society*. Wiley-Blackwell. Taft, J.B., Phillippe, L.R., Dietrich, C.H. and Robertson, K.R. 2011. *Grassland composition, structure and diversity patterns along major environmental gradients in the Central Tien Shan*. *Plant Ecology*, 212(8): 1349–1361. Wagner, V. 2009. *Eurosiberian meadows at their southern edge: patterns and phytogeography in the NW Tien Shan*. *Journal of Vegetation Science*, 20(2): 199–208. WWF (2006) *WildFinder: Online database of species distributions*. Downloaded from [www.worldwildlife.org/WildFinder](http://www.worldwildlife.org/WildFinder), ver. Jan-06, accessed in October 2015. WWF (2015) *List of ecoregions*. Downloaded from [http://wwf.panda.org/about\\_our\\_earth/ecoregions/ecoregion\\_list/](http://wwf.panda.org/about_our_earth/ecoregions/ecoregion_list/), accessed in October 2015.

**d) Consultations:** 7 desk reviews received. The mission was only able to meet separately with representatives of the three nominating State Parties as no joint discussions were deemed feasible by the State Parties, regarding the transnational property as a

whole. In Kyrgyzstan the mission met with the National Commission for UNESCO, State Agency of Environment Protection and Forestry, staff of Padysha-Ata State Nature Reserve and the Sary-Chelek State Biosphere Nature Reserve; as well as the local community in Sary-Chelek. In Kazakhstan meetings were held with the staff of Aksu-Jabagly and Karatau State Nature Reserves; Sairam-Ugam State National Nature Park; and representatives of the Akimat regional authority. In Uzbekistan the mission met with the State Committee on Nature Protection; State Biocontrol Inspection authority; State Museum of Geology; UNESCO Tashkent office; the National Commission for UNESCO; staff of Chatkal State Biosphere Nature Reserve; and representatives of the Tashkent regional municipality.

**e) Field Visit:** Kyung Sik Woo and Elena Osipova, 12-23 August 2015

**f) Date of IUCN approval of this report:** April 2016

## 2. SUMMARY OF NATURAL VALUES

The nominated property, Western Tien-Shan (WTS) is a transnational serial nomination, lying within the Republics of Kazakhstan, Kyrgyzstan and Uzbekistan. IUCN recalls its 2013 evaluation of the Xinjiang Tianshan nomination from China, a property which was subsequently inscribed onto the World Heritage List under natural criteria (vii) and (x). The WTS, like Xinjiang Tianshan, also lies within Central Asia's Tianshan Mountain system, one of the seven largest mountain ranges in the world. The range is aligned almost east-west, with a total length of 2,500km and

extends from the eastern Xingxingxia Gobi in Hami, Xinjiang to the western Kyzylkum Desert in Uzbekistan, encompassing the four countries of China, Kazakhstan, Uzbekistan and Kyrgyzstan. Together with the Altai Mountains in the north, the Kunlun Mountains in the south and the Pamir in the west, the Tianshan makes up the mountainous backbone of Central Asia. It is the largest mountain chain in the world's temperate arid region, and is also the largest isolated east-west stretching mountain range globally. Trans-meridionally, it can be divided into the eastern Tianshan Mountains in China and the western Tianshan Mountains in Kazakhstan, Uzbekistan and Kyrgyzstan.

The nomination dossier indicates the property consists of 13 component parts drawn from seven protected areas. The seven protected areas include in Kazakhstan: Karatau State Nature Reserve (SNR); Aksu-Jabagly SNR - 3 components; and Sairam-Ugam State National Nature Park (SNNP) - 3 components; in Kyrgyzstan Sary-Chelek State Biosphere Nature Reserve (SBNR); Besh-Aral SNR - 2 components; and Padysha-Ata SNR; and finally in Uzbekistan the Chatkal SBNR - 2 components. The component parts of the transnational serial nomination and their areas are detailed in Table 1. Only some areas have designated buffer zones. IUCN notes that the configuration of this serial nomination is complex and in some areas confusing. There are some discrepancies in the reported number of components regarding the configuration of areas for Kazakhstan, in particular the Irsu-Daubabin component of the Sairam-Ugam SNNP which appears is mapped as two different areas with the protected area.

State Party	Protected Area	Component	Nominated Area (ha)	Buffer Zone (ha)
Kazakhstan	Karatau SNR		34,300	17,490
	Aksu-Jabagly SNR	Aksu-Jabagly SNR - main part	131,704	25,800
		Aksu-Jabagly SNR - Karabastau paleontological area	100	
		Aksu-Jabagly SNR - Aulie paleontological area	130	
	Sairam-Ugam SNNP	Sairam-Ugam SNNP - Boraldaitau area	26,971	4,900
		Sairam-Ugam SNNP - Irsu-Daubabin area	45,509	8,200
		Sairam-Ugam SNNP - Sairam-Ugam area	76,573	13,900
Sub total		315,287	70,290	
Kyrgyzstan	Sary-Chelek SBNR		23,868	18,080
	Besh-Aral SNR	Besh-Aral SNR - main part	112,018	
		Besh-Aral SNR - Shandalash area	25,270	
	Padysha-Ata SNR		16,010.6	14,545.8
Sub total		177,166.6	32,625.8	
Uzbekistan	Chatkal SBNR	Chatkal SBNR - Maidantal area	24,706	
		Chatkal SBNR - Bashkizilsay area	11,018	
Sub total		35,724		
<b>Total</b>			<b>528,177.6</b>	<b>102,915.8</b>

**Table 1** Configuration of the Western Tien-Shan nominated property

The region experiences a distinct continental climate with cold, snowy winters contrasting with hot, dry summers. The climatic conditions are further modified by the mountainous terrain which creates microclimates and pronounced vertical zonality in the climate and ecology. The WTS across its various

components ranges in altitude from 700 to 4,503 m above sea level.

Even though the proposed property is nominated as the 'Western Tien-Shan', geographically implying the western part of the Tianshan mountain range, the nominated areas encompass two parts of totally

different geological origin, namely the Tianshan Mountains and the Karatau Mountains. The property has a very complex geological structure as it is situated at the junction of two structural and formational zones: North Tian-shan and Karatau-Naryn. The modern Tianshan Mountains are considered to be of relatively younger age compared to the Karatau Mountains and the clear geological distinctions between the two regions has provided different landforms and ecological characteristics.

Geologically the Tian-shan Mountains are composed of Proterozoic crystalline gneisses and sedimentary rocks of Paleozoic origin (Silurian, Devonian and Carboniferous periods). An especially thick Carboniferous limestone sequence contains numerous shallow marine invertebrate fossils for each period (and some vertebrates for some later periods). The Karatau Mountains include Paleozoic carbonaceous sedimentary rocks and Mesozoic to Cenozoic sand and shale deposits at the foot of hills. In the two smaller paleontologically focused component parts of the nominated property the shale contains numerous Jurassic plant and animal fossils. More than 60 species of plants, 100 species of insects and molluscs, crustaceans, turtles and fishes have been reported from past excavations. The dossier does not provide a complete list of fossils excavated from the nominated property in Aksu-Jabagly SNR or the findings of paleontological research undertaken over the past decade. Despite the reports from past excavations, IUCN's field mission noted limited fossil interest evident in the field. The mission was informed that all the excavated fossils are stored in a museum in St. Petersburg. It was thus not possible to confirm the fossil values in these components, either on-site or within stored collections. In the majority of the component parts of the property, there is limited comparable geological conservation interest, and these components are not presented as relevant to the consideration of criterion (viii).

In terms of species and ecosystems, the WTS includes a wide variety of landscapes which, in turn, support an exceptionally rich biodiversity including numerous endemic species. The region is characterized by a high diversity of plant communities in different species assemblages, including a combination of different types of coniferous and deciduous forests, some in combination with wild fruit tree species. A number of critically endangered plant species also occur in the property, such as Knorringiana Hawthorn (*Crataegus knorringiana*) and Karatau Honeysuckle (*Lonicera karataviensis*). Very high plant species endemism is particularly characteristic for Karatau SNR (61 endemic genera of angiosperms).

The Western Tien-Shan region is one of 12 global centres of origin for nut, fruit, and many cultivated plants of importance to agrobiodiversity (38 important agricultural crops). Over 20% of the world's cereals, vegetable and spice plants, and 90% of the major temperate-zone fruit crops are found in this region. The wild fruit and nut forests of Western Tien-Shan are considered to be an important genetic resource for the development of future strains of pest and disease

resistant domestic fruit and nut species. Many domesticated plant species, particularly fruit and nut plants are reported for the nominated property. Several are listed on national level Red Lists and some on the IUCN Red List, a number of which are considered globally threatened: Siverse's Apple (*Malus sieversii*, VU), Nedzvetsky's Apple (*Malus niedzwetzkyana*, EN) and Wild Apricot (*Armeniaca vulgaris*, EN). Other listed species include Pistachio (*Pistacia vera*, NT), Wild Grape (*Vitisvinifera*, LC), Hawthorn (*Crataegus pontica*, LC), Walnut (*Juglans regia*, NT), Plum (*Prunus sogdiana*, NE) and Regel's Pear (*Purus regellii*, NE). The walnut-fruit forests of the region are considered to be the largest forest of this type in the world. Of particular interest is the Siverse's Apple tree which of all wild apple species is considered the progenitor of today's variety of apples.

The vertebrate biodiversity found in the region of Western Tien Shan includes 61 species of mammals, 316 species of birds, 17 species of reptiles, 3 species of amphibians and more than 20 fish species, and almost all of these species are reported as occurring in the area of the nominated property. This region is also internationally important because of a number of globally threatened faunal species. These include several bird species mentioned in the nomination file, including Eastern Imperial Eagle (*Aquila heliaca*, VU), Great Bustard (*Otis tarda*, VU), Pale-backed Pigeon (*Columba eversmanni*, VU), Saker Falcon (*Falco cherrug*, EN) and Egyptian Vulture (*Neophron percnopterus*, EN). Threatened mammals include Dhole (*Cuon alpinus*, EN), Menzbier's Marmot (*Marmota menzbieri*, VU), Snow Leopard (*Panthera uncia*, EN) and the European Marbled Polecat (*Vormela peregusna*, VU).

IUCN notes that for many of the specific attributes outlined above it is difficult to assess with certainty that they occur within the component parts of the nominated property. The nomination appears to have been constructed with separate technical input from each nominating State Party and while the dossier presents extensive information on each of the components, consolidated information for the entire property is lacking. For example figures for species numbers are given separately for each component and it is not always clear how much overlap there is and thus what the total species figures would be for the entire nominated property. Information provided in response to IUCN's requests provides some additional breakdown of endemic and threatened species for the component parts, however, the species numbers are not consistent with information held by UNEP-WCMC and it is still not clear what overlap exists between the species complements for each component. There are many gaps in biodiversity data in this region.

### 3. COMPARISONS WITH OTHER AREAS

The WTS is nominated in relation to criteria (viii) and (x). At the outset this choice of criteria appears, at least in part, to be driven by an inappropriate interpretation of complementarity with the Xinjiang Tianshan property, inscribed in the eastern part of the

range in China. The nomination file indicates that “given that the East Tien-Shan site was nominated by criteria vii and ix, it seems reasonable to nominate Western Tien-Shan by criteria viii and x”. This does not represent an approach that is rooted in the actual values of the nominated area, which do include values that could be relevant under other natural criteria, and in general the justification for both criteria (viii) and (x) seems weak as currently presented. Despite the high similarity in both flora and fauna with Xinjiang Tianshan, the nomination does not reflect in any depth on how the values of WTS compare and contrast with those of the site in China nor how the serial configuration collectively corresponds to any of the natural criteria. While stating that all components “are the most representative for this geographical unit in every country”, the nomination dossier does not elaborate in any detail as to how each contributes to the property’s potential Outstanding Universal Value, or how they have been selected. In supplementary information the States Parties have indicated a reconsideration of the criteria under which they wish to nominate the property namely criteria (vii), (ix) and (x). The States Parties have also indicated a willingness to adjust the design and boundaries of the nominated property. IUCN welcomes this review. The below evaluation drawing upon the field mission and other inputs has considered criteria (viii) and (x) and the site boundaries as originally nominated, and provides a basis to further consider with the States Parties a revised approach to a nomination.

The nomination dossier includes a limited and somewhat superficial comparative analysis which for criterion (viii) compares the WTS to 15 other World Heritage Sites inscribed for their fossil values. This analysis concludes that the Dorset and East Devon Coast (UK) presents the closest comparison as it also protects Jurassic period fossils. It concludes by noting the complementarity of the WTS (the two small components within Aksu-Jabagly SNR in Kazakhstan which protect paleontological sites) to the UK site arguing that WTS contains a greater diversity of insect fossils endemic to the property and a different assemblage of fossilized vertebrate species. The nomination notes that compared with the WTS there is “no other place in the world with such a rich and interesting burial of Mesozoic insects”. The two components certainly are known internationally for their significant insect fossils, which is an exceptional example. However IUCN notes that this would be a narrow basis for considering the application of criterion (viii) and that the values for which the Dorset and East Devon Coast are inscribed embrace a wider range of values across the Mesozoic, including a significant record of insects that are subject to ongoing research, but also the significant range of marine vertebrate and other marine fossil sites, across a much larger window of time than the nominated property, and with much greater diversity and international contributions to geoscience.

The nomination’s comparative analysis did not analyse the site in terms of IUCN’s ten point framework for the assessment of fossil site nominations, but in the view of IUCN such an analysis would not show a strong

case for inscription under criterion (viii), and further notes the fundamental point that the application of criterion (viii) only relates to a small number of the component parts of the series, with the large majority of the nomination not providing any clear set of reasons to justify application of this criterion. Therefore, despite the abundant fossil record of the two of the nominated components, IUCN concludes that the WTS does not make a case for meeting criterion (viii). In the most recent information from the States Parties, it is implied that a revised proposal would not include a nomination in relation to criterion (viii).

Concerning criterion (x) the nomination’s comparative analysis looks at eight other sites in the region it describes as the Central Asian Highlands. Comparisons are made with several other mountain systems including Xinjiang Tianshan (China), Tajik National Park (Tajikistan), Golden Mountains of Altai (Russia) and Uvs Nuur Basin (Russia/Mongolia). It concludes that many of the values of the WTS are similar yet distinctive and so complement other sites, for example in providing additional habitat for some globally threatened species with wide habitat ranges such as Snow Leopard. The analysis emphasizes the importance of the WTS as a centre of origin for cultivated plants. The strongest comparisons (despite the differences in selected criteria) are logically made with Xinjiang Tianshan in China, concluding on a number of similarities but drawing several valid distinctions between these properties which are in the same Pamir-Tien-Shan Highlands biogeographic province. More analysis is however needed to appreciate the degree of complementarity with Xinjiang Tianshan in areas such as species richness; degree of endemism; and habitat needs for shared threatened species including issues of range connectivity. Supplementary analysis by the nominating States Parties has considered a number of other protected areas in this region (three additional areas in Kazakhstan and one in Uzbekistan). A table giving simplified comparisons was made across ecosystems, biodiversity (endemic and threatened species), overlap with biodiversity prioritising systems and ‘picturesqueness’ of the landscapes. Additional analysis was provided on integrity and protection and management aspects. This additional analysis provides some further insights however is a preliminary and superficial assessment related to the State Parties’ stated intentions to improve the justification of Outstanding Universal Value, reconfigure the site boundaries and proposed criteria in the short term (March-April 2016).

Additional assessment with the support of UNEP-WCMC indicates the potential of this region (but not necessarily the current selection of component parts) to demonstrate globally significant biodiversity values. This is a view consistent with IUCN’s 2013 evaluation of Xinjiang Tianshan which advocated a transnational serial approach along the extent of the Tianshan Mountain range. The nominated property is situated in three ecoregions, two of which are not yet represented on the World Heritage List: Alai-Western Tian Shan Steppe and Gissaro-Alai Open Woodlands.

Furthermore WTS belongs to the biodiversity hotspot Mountains of Central Asia; the terrestrial priority ecoregion Middle Asian Montane Woodlands; and the Steppe and Mountains of Middle Asia Centre for Plant Diversity, all of which are represented by only two existing sites on the List: Tajik National Park (Tajikistan) and Xinjiang Tianshan (China). WCMC conclude that the WTS region could constitute one of the most species rich sites in the Pamir-Tien-Shan Highlands province. It has been estimated that close to half of the species recorded within the region are endemic to Middle Asia. WTS hosts some globally threatened species and is also renowned for its Wild Sheep, with important populations of the Near Threatened Argali Sheep. The nominated property also overlaps with three Important Bird Areas (IBAs): Aksu- Dzhabagly State Nature Reserve, Kenshektau Mountains and the Bashkizylsay Unit of the Chatkal Mountains Biosphere Reserve.

Central Asia has been flagged as one of two major areas of the world where only a few World Heritage sites exist and as a priority for nomination. The Chatkalsy SNR component of the nominated property was noted in IUCN's 1982 analysis of areas for World Heritage potential, and Aksu-Jabagly SNR, another component of the property, is a mountain protected area that has been suggested within IUCN's 2002 Mountains Thematic Study as having potential to be nominated to the List. Part of this protected area also ranks highly in terms of global analysis of irreplaceable areas for species conservation.

In conclusion UNEP-WCMC's spatial analyses and literature review indicate that the biodiversity which characterizes the WTS region is potentially of global significance under both biodiversity criteria and the region clearly offers potential for complementary values to those of the Eastern Tianshan. Supplementary information provided by the State Party reinforces this view and indicates an intention by the three nominating States Parties to redesign and re-nominate the property under an adjusted set of criteria. IUCN welcomes the opportunity to revisit, within a sufficient timeframe, the justification and site configuration thus ensuring that the best serial configuration is proposed to complement the values of the Xinjiang Tianshan World Heritage property in China.

In summary, the property as currently nominated does not make a compelling case for meeting World Heritage criteria, but a reconfigured approach may have potential to do so, in particular in relation to criteria (ix) and (x).

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

The majority of the nominated property is state owned across all three countries. In Kazakhstan all areas are under government ownership, except for 13.2 ha of private property in the area of limited economic activity in Sairam-Ugam SNNP. The areas of the buffer zones

are also state property. With the exception of the smaller paleontological areas certain activities are allowed in the buffer zones, including agriculture. In Kyrgyzstan all components are state property. In Sary-Chelek SBNR there is one settlement (Arkit) within the buffer zone. In Uzbekistan the concerned components are also under state ownership.

Each component protected areas have, individually, an adequate protection status under relevant national legislation. All the protected areas except Sairam-Ugam National Park (IUCN category II) are strict nature reserves (considered equivalent to IUCN category Ia) and all have a functioning management system. However, transboundary cooperation, which is required as an essential aspect of any serial nomination, is currently substantially absent across the series, and at no point in the evaluation was IUCN able to engage with all the three responsible authorities in a joint discussion of the nomination. The nomination provides no analysis of how protection will be coordinated to guarantee consistency of the protective regime for the nominated property as a whole. In conclusion protection and management of individual components of the nominated property appears adequate; however, there is no joint transboundary protection and framework yet in place for the entire nominated property (see also comments below under management).

Despite concerns regarding the inadequacy of transboundary cooperation and an overarching management framework, IUCN considers that the protection status of the nominated property meets the requirements of the Operational Guidelines.

### 4.2 Boundaries

The boundaries of the property as nominated are inadequate for reasons discussed below, and concerns on this were relayed to the States Parties via IUCN's letter of 16 December 2015. Of fundamental concern is the lack of a convincing values-based rationale to underpin the selection of component parts which make up the nominated property. The supplementary information received provides some further justification as to the choice of components within the three countries based upon ecological values, integrity and protection levels. It also confirms that the States Parties acknowledge the need to make boundary adjustments with respect to the removal of certain zones and newly proposed criteria.

The boundaries of the various protected areas which make up the nominated property are conceived on a variety of different rationales. A number of the components of the protected areas in Kazakhstan do not have boundaries which are based on ecological principles or which follow natural features such as contours or watercourses: for example Karatau SNR and parts of Sairam-Ugam SNNP. The configuration of the Irsu-Daubabin area within Sairam-Ugam SNNP is particularly confusing and was not able to be clarified by the field mission despite many requests. Here there appears to be an isolated area in the east and a large section within the property which is excluded.

In addition the components have differing approaches to buffer zones, including whether these are provided or not. Where they do exist they are of uniform width and do not appear to follow any ecological rationale which draws into question their effectiveness in protecting critical natural values. Two components (Besh-Aral SNR, consisting of two clusters and Chatkal SBNR, also consisting of two clusters) do not have buffer zones. In the case of Besh-Aral no explanation was provided to the mission on the reason why it does not have a buffer zone; however it may be that it is a very remote area with no human disturbance and therefore a buffer zone was not considered necessary. The boundary of the nominated site in Besh-Aral SNR in Kyrgyzstan follows the state boundary with Uzbekistan. As for Chatkal SBNR, it was explained to the mission that the two clusters of the nature reserve are located completely within a national park which serves as a *de facto* buffer zone. The Uzbekistan authorities were unable to provide a map showing the location of the nominated components within the national park which could have helped to clarify the situation. IUCN is concerned at the approach to define buffer zones by excision of a protected area.

Aside from issues with the boundaries of the component parts and buffer zones, there are concerns with respect to how the zoning systems within the protected areas operate and if they provide appropriate levels of protection to key values. The maps annexed to the dossier lack information on different zones within the component protected areas and the mission was unable to review consistent mapping across the property. As noted for the Sairam-Ugam component, this is critical as a part of the national park is an excision. Supplementary information provides a table showing the zones and areas within Sairam-Ugam SNNP and proposes a further exclusion of some 80,339 ha covering the 'tourism and recreation' and 'limited economic use' zones. Maps were not provided with this supplementary information to be able to clarify these boundaries, however they are reported as in preparation.

For the nominated components under criterion (viii) in Aksu-Jabagly SNR (which are not physically connected to the main area of the nature reserve), the adequacy of boundaries cannot be assessed, due to the lack of information on the localities of previous fossil sites excavated. The size of the nominated components results from the boundary of the nature reserve, and is not necessarily based upon the fossil occurrences, which could arguably be more extensive than the protected area.

The value of the nominated property as habitat for large range species such as Snow Leopard is compromised by its lack of continuity of the serial nomination. No information on the provision of connectivity between the components has been provided in the nomination, nor in the additional information. This would be a crucial issue to consider in a revised nomination related to biodiversity. Other concerns include that the most critical habitat for the

endemic Menzbier's Marmot is also excluded from the territory of one of the components (Sairam-Ugam SNNP) where an enclave area within the national park does not belong to the national park and is used for grazing.

In conclusion the nomination and supplementary information remain inconclusive as to the manner in which the serial property is configured to protect the most important areas with regards to the proposed biodiversity values and how they complement each other in demonstrating Outstanding Universal Value, and confirms that there are a large number of matters concerning the configuration of component parts, buffer zones and connectivity that require a substantial amendment to the nomination, in order to meet the integrity requirements of the World Heritage Convention.

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

### 4.3 Management

All component parts of the property individually appear to be managed adequately and have sufficient staff capacity to address existing threats, such as poaching, illegal logging and grazing, even though capacity could always be increased. Since almost all components are either strict nature reserves (IUCN Category Ia) or, in one case, a national park (IUCN Category II) they are subject to a specific management regime which is geared to ensuring protection. In Kazakhstan the responsible management authority is an authorised state executive body – the Committee of Forestry and Wildlife at the Ministry of Agriculture. In Kyrgyzstan management authority rests with the State Agency on Environment Protection and Forestry. In Uzbekistan the Chatkal SBNR is a protected area of national importance and managed under the regional authority, Tashkent Regional Khokimiat.

Two nominated components for criterion (viii) in Aksu-Jabagly SNR were reportedly excavated for fossils in connection with research carried out in the 1960s. All the fossils excavated during the period have been stored in St. Petersburg Museum. According to information received by the mission from local residents, no scientist has visited the sites in the past 20 years. Whilst noting the advice from the States Parties that the property will not be reconsidered under criterion (viii), the mission noted the lack of recent research and/or monitoring of the fossil values and raised questions about how management capacity would be re-established to ensure active protection.

With respect to general management all park managers carry out routine monitoring, for example for fire, visitors, etc. Clearer monitoring indicators are needed for the protection of ecosystems, biodiversity, threatened species and geodiversity.

On the level of the whole tri-national transboundary property, as noted above, there is no evidence of joint management arrangements being in place at site level.

During the mission, representatives of the respective state level agencies in Kyrgyzstan and Uzbekistan expressed their readiness to start exploring options of establishing some kind of joint management system. IUCN welcomes the advice in supplementary information that a Memorandum of Agreement between the three countries is under development, however, at the time of this evaluation report only Kazakhstan had signed the agreement (as transmitted in the supplementary information) and there is very limited integrated management across the serial property as a whole.

All component parts have their own management plans and their own monitoring systems; however, there is currently no common monitoring system. From the discussions with the staff of the component protected areas it became clear that there has to date been little consideration of the implications of World Heritage and that considerable further work is needed to consider how sites could be managed, for example in terms of monitoring of the values for the series as a whole, awareness raising and education programmes focused on the Outstanding Universal Value.

All component protected areas appear to have relatively adequate budgets, however, no additional budget is currently foreseen for the joint management system of the whole transboundary nominated property. Staffing levels are variable with a reported 233 staff across the three protected areas in Kazakhstan; 92 staff are reported for the Chatkal SBNR in Uzbekistan; and 142 staff are noted for the three protected areas in Kyrgyzstan. All areas appear to have appropriately qualified technical staff.

Tourism use of the property is currently modest. Most visitor centres have limited displays on the biodiversity and geoheritage values of the nominated areas, an area that would require attention and investment.

While protection and management of individual components of the nominated property appears adequate, joint transboundary management framework for the entire nominated property is currently lacking and IUCN considers the management of the nominated property does not meet the requirements of the Operational Guidelines.

#### 4.4 Community

All component protected areas within the nominated property are state owned (with the exception of some small privately owned areas). They are generally subject to high level of protection with restrictions on access, since most of them are strict nature reserves. One exception is Sairam Ugam whose status as a national park implies lower level of protection and which also has significant integrity issues discussed elsewhere in the report. Certain types of use, such as hay production and berries collection for local use, appear to be allowed in some parts of some of the components; however, full information on these matters is not available, though it was requested during the evaluation mission. For example the components within Kazakhstan are located in a region

of high population density but population pressure in areas adjacent to the protected areas is relative low. The areas surrounding Chatkal SBNR are also subject to high population densities. Interactions with local people have usually centred on natural resource use (grazing, hay-making, logging, poaching and other harvesting). There is little evidence of participatory management engaging local people.

Overall, the nomination process appears to have had minimal impact on the local communities, over and above the current operation of the protected areas. It can be also assumed that inscription of the property will have little impact as the relationship between local communities and the component protected areas will continue as they are.

#### 4.5 Threats

A number of components of the nominated property have suffered from intensive use (grazing, logging, hay collection) in the past before they were protected, but the areas have been recovering since the establishment of protected areas. This is the case in the following components:

- Karatau SNR which suffered from extensive logging and grazing in the 1990s. The nature reserve was created in 2004.
- Sairam-Ugam SNNP was created in 2006 only.
- Sary-Chelek SBNR and Padysha-Ata SNR (created in 2003) were also subject to logging in the past.
- Grazing occurred in some parts of Besh-Aral SNR in the past.

Some of the most significant elements of the nominated property have been severely impacted by past use, such as the Siverse's Apple forest stands which are now restricted to small separated patches. Despite this the protected areas in general appear to have substantially retained their values. Aksu-Jabagly SNR (Kazakhstan), established in 1926 is the oldest nature reserve in Central Asia and one of the best preserved areas in the region.

Grazing still represents an ongoing management issue in some areas, e.g. in the Chatkal component in Uzbekistan which as noted above is located in a more densely populated region. Cattle were observed by the mission on the boundaries of the component and the impacts of grazing could be observed within it. Chatkal SBNR also suffers from a range of invasive plant species. In all three Kazakh components, illegal grazing also occurs within the protected areas. In Sairam-Ugam SNNP there is an area located completely within the national park, but excluded from its territory, which is used for grazing. Moreover, since it is an enclave, the access to the area is only possible through the territory of the national park. This area is a critical habitat for the endemic Menzbier's Marmot.

Hay collection is permitted in some components within special use zones, but as described above the exact zonation of all components is not clear. Illegal hay collection and poaching most likely also occurs in many areas. According to the nomination dossier,

Argali, Siberian Ibex (LC), Wild Boar (LC), Bear, Badger and Porcupine are being targeted by poaching in the Kazakh components of the property. Little information is available on poaching in other components. No current threat to fossil values is present in the nominated components under criterion (viii) in Aksu-Jabagly SNR.

Visitor numbers in most of the components are currently low and, since most of the components are strict nature reserves, visitation is limited to very restricted areas and is only allowed by permit. In Kazakhstan only the Sairam-Ugam SNNP is open to visitors and numbers are strictly controlled. The three protected areas in Kyrgyzstan are closed to the public however some limited access is permitted to the Sary-Chelek SBNR. A limited number of visitors and outside researchers are allowed to work in the Chatkal SBNR in Uzbekistan. It is noted that many of the property's component parts are surrounded by areas of high population density suggesting the potential for significantly increased tourism demand in the event of World Heritage status being granted. This should be considered and management measures prepared.

In conclusion IUCN considers that the integrity and protection and management requirements of the Operational Guidelines are not met by the nomination at the present time, and significant further work is required in this regard.

## 5. ADDITIONAL COMMENTS

### 5.1 Justification to serial approach

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

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

While the serial approach can be justified in principle, in relation to biodiversity criteria, by the idea of including the most representative areas of unique biodiversity of Western Tien-Shan, neither the nomination dossier nor the discussions held during the mission give enough clarity about why exactly these components have been selected in each country and how they complement each other. The supplementary information contends that the components provide the best preserved and well managed protected areas in the region.

Nevertheless it remains unclear how the values of the different components complement each other to convey an overall story for the vast Western Tien-Shan (and the relationships to other parts of the Tien Shan range). More analysis of biodiversity such as the species overlaps between the components is needed to fully justify the serial approach. As was noted in IUCN's evaluation of the Xinjiang Tianshan (China) there are significant differences in physical geography and biological features in different parts of the Western Tien-Shan and no single component can completely represent Outstanding Universal Value. IUCN welcomes the intention of the State Parties to revisit the site's value arguments, choice of criteria and site

configuration, and stands ready to support the selection of components which represent a spectrum of diverse landform types and biological values which together make the case for Outstanding Universal Value.

The areas of potential significance under criterion (viii) include only two small paleontological sites in Kazakhstan which are officially part of the Aksu-Jabagly SNR, but are separated from the main reserve area. They are otherwise not connected to the rest of the nominated property and there are no other areas within the nominated property where globally significant geological values in the Tianshan Mountains are noted, thus for criterion (viii) the serial approach has not been justified.

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

The functional linkages between the component parts of this site as nominated are unclear and there is not yet in place a convincing case made that each of the components contributes to a coherent series representing the outstanding values of the Western Tien-Shan (and possibly the Central Tien-Shan) that complements other parts of the extensive Tianshan Range.

The components of the nominated property are sometimes separated by significant distance. However, since many of them are located in the remote inaccessible mountain areas, natural corridors for wildlife movement in those areas are probably not affected by any human disturbance. Karatau SNR is located quite far away from the rest of the nominated components and it also differs from the rest in terms of its vegetation types and fauna as it is situated in the much older Karatau mountain ridge. This area also displays very high levels of endemism with high numbers of endemic species and it is debated whether it is technically part of the Tien-Shan Mountains, or not.

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

As noted above, there is not yet in place a convincing transboundary management framework for the entire nominated property, nor a joint management system for nominated components in each country. The development of a tripartite Memorandum of Agreement is a very positive step however this has not yet been signed by the State parties of Uzbekistan or Kyrgyzstan and the instrument is a high level agreement of only 3 pages which lacks any technical detail.

### 5.2 Potential to meet other criteria

Noting the States Parties' advice that this property will be re-nominated under criteria (vii), (ix), and (x), it is important to recall that the comparative analysis indicates that the WTS region has the potential to meet criterion (ix) in relation to the variety of different types of forests and combinations of plant communities,

including the wild fruit species, that are of particular interest. The nominated property is situated in three ecoregions, two of which are not yet represented on the World Heritage List, as well as coinciding with a number of biodiversity priority ecoregions and centres of diversity. IUCN also notes that the Tentative List of Kazakhstan also includes other sites in the Tian Shan range that are not considered in the nomination, and considers these should be evaluated as part of an assessment of the overall potential to reconsider the nomination.

## 6. APPLICATION OF CRITERIA

The **Western Tien-Shan** has been nominated under natural criteria (viii) and (x).

### Criterion (viii): Earth history and geological processes

The nomination under this criterion relates to the fossil site component parts within the nomination, that record a variety of abundant fossils such as insects, other invertebrates and some vertebrates. The two nominated component areas display very little evidence of this diversity in the field with only a few kinds of calcareous invertebrate fossils observed. Many fossils were removed from the site and there is little evidence of recent scientific interest as the most recent research dates from the 1960s and 1970s. The site potentially exhibits well-preserved fossil accumulations of high species diversity, and includes invertebrate as well as vertebrate assemblages. However the nominated areas fail to demonstrate how they inform the iconography of a tree of life, illustrate any major chapter of the story for the Jurassic Period or present Phanerozoic history in terms of communities and/or stages in the evolution of major groups. The nomination cannot be representative in time and space of both community structure and selected phylogenetic lineages. Fundamentally, the large majority of component parts do not contribute attributes relevant to this criterion, and thus the approach to recognising these values through the series is fundamentally flawed.

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

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

The biodiversity that characterizes the region within which the nominated serial property is located appears to be of global significance with potential to meet biodiversity criteria. The Western Tien-Shan Region is globally important as the centre of origin of a number of cultivated fruit species as is its high diversity of different types of forests and unique combinations of plant communities. The region also overlaps with several underrepresented biogeographic regions and coincides with a number of globally important ecoregional priorities and centres of diversity. Situated in Central Asia, the nominated property is also within a region identified as a priority gap on the World Heritage List. WTS could constitute one of the most species rich sites in the Pamir-Tien-Shan Highlands province and it has been estimated that close to half of

the species recorded within the region are endemic to Middle Asia. WTS hosts some globally threatened species such as Snow Leopard and is also renowned for its Wild Sheep, with important populations of the Near Threatened Argali. The Menzbier's Marmot is an endemic species found only in Western Tien-Shan and of the nominated components only in Sairam-Ugam National Park in Kazakhstan. However, this component suffers from serious integrity issues and the most critical habitat for the Menzbier's Marmot is excluded from the territory of the protected area as it is used for grazing.

While most reviewers consider that the region of the Western Tien-Shan nominated property holds potential for Outstanding Universal Value, the lack of informative and convincing analysis on biodiversity, a confusing site configuration and a weak justification for the serial approach combine to mean the present nomination is not able to meet criterion (x). In addition neither integrity, nor protection and management requirements are met.

IUCN considers that the nominated property does not meet this criterion, however, a significantly revised configuration of areas within the Western (and possibly central) Tien-Shan area has potential to meet either, or both, criteria (ix) and (x).

## 7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC/16/40.COM/8B and WHC/16/40.COM/INF.8B2;

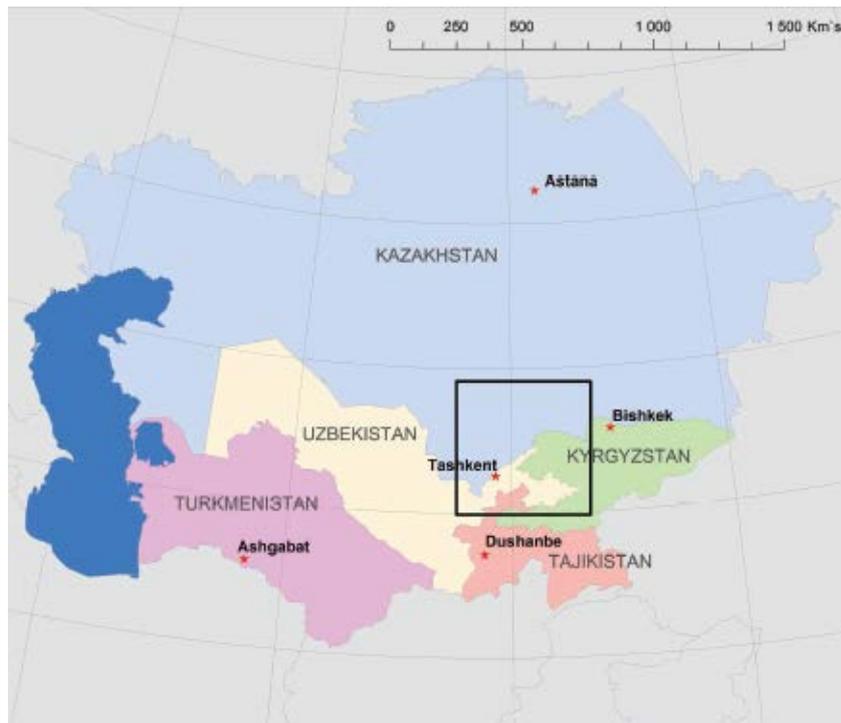
2. Defers the nomination of **Western Tien-Shan (Kazakhstan, Kyrgyzstan, Uzbekistan)** in order to allow the States Parties, with the support of the World Heritage Centre and IUCN if requested, to prepare a new and significantly revised nomination that would be based on the following actions:

- a) undertake a more in depth analysis of the natural values of the wider Tien-Shan Mountain Region, with respect to the potential to demonstrate Outstanding Universal Value, including consideration of existing World Heritage listings in the region and all relevant sites on national Tentative Lists, and reconsider fully the criteria that would best represent this potential;
- b) based on the abovementioned analysis and the possible adoption of revised criteria, undertake a rigorous selection of component parts that would provide a convincing and clearly argued serial configuration to a new nomination;
- c) ensure clear, consistent and ecologically based boundary mapping of the component parts and buffer zones of new nomination;
- d) finalize sign-off of a tripartite Memorandum for management of the revised nomination between the States Parties of Kazakhstan, Kyrgyzstan

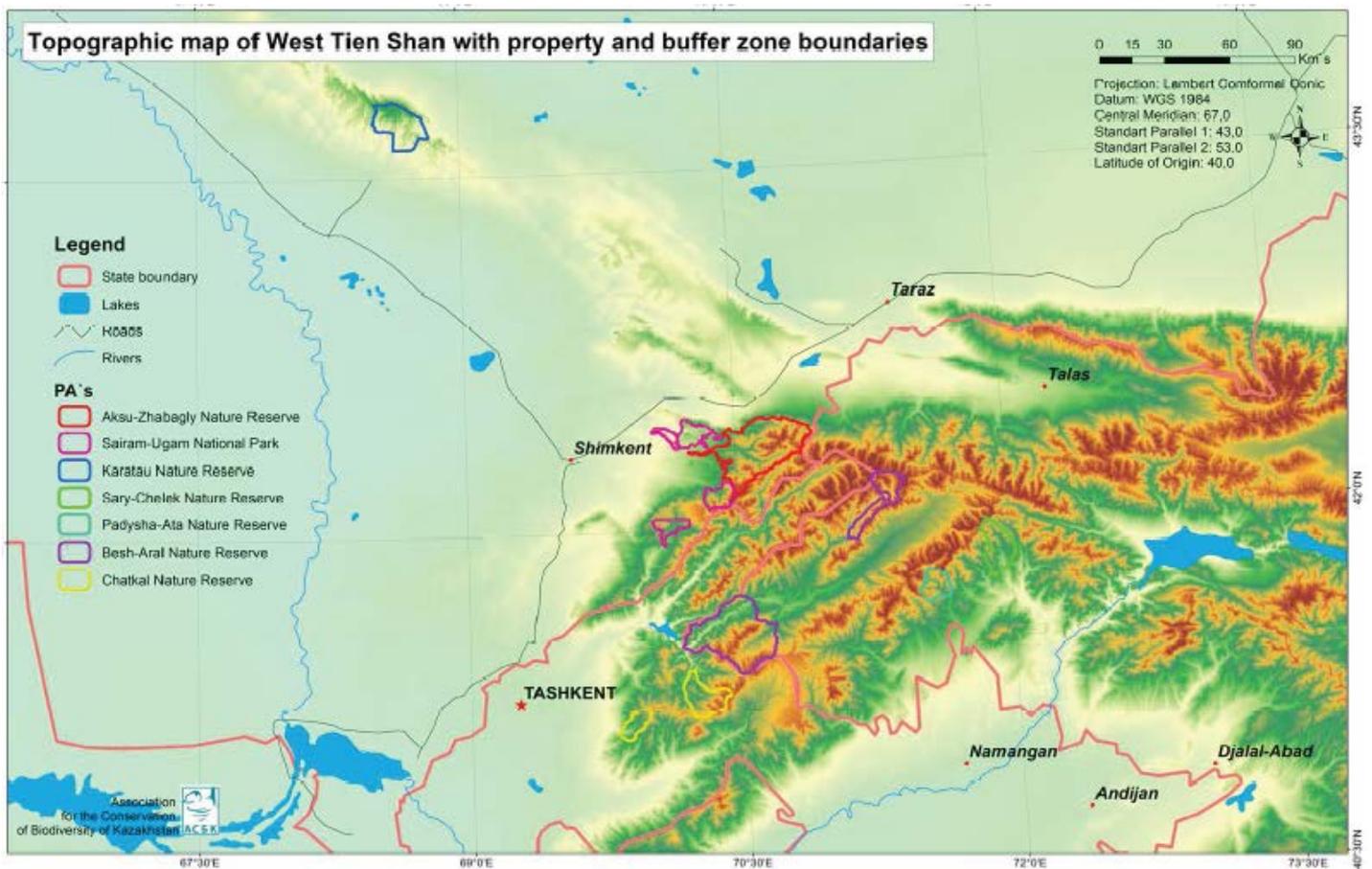
- e) and Uzbekistan, and include specific targets and timelines that would strengthen cooperation at field operational and technical levels;
- f) prepare a management framework for the new nomination, which details, at an appropriate level, integrated protection and management measures, which can be implemented through the respective national level policy and planning processes, and is fully connected to the protection and management plans for each of the selected component parts.

3. Commends the States Parties for the efforts to date towards transnational cooperation and encourages them to deepen further this cooperation in revising the nomination, and in the areas of protection and management capacity and coordination necessary to support a revised serial nomination.

**Map 1:** Location of the nominated property in Central Asia



**Map 2:** Nominated property (13 components in 7 Protected Areas) and buffer zone





**ASIA / PACIFIC**

# **MOUNTAIN ECOSYSTEMS OF KOYTENDAG**

**TURKMENISTAN**



View over Hojapil State Landscape and Paleontological Sanctuary - © IUCN Remco van Merm



# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## MOUNTAIN ECOSYSTEMS OF KOYTENDAG (TURKMENISTAN) – ID 1521

**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 World Heritage criteria.

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

## 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 16 March 2015

**b) Additional information officially requested from and provided by the State Party:** Following the IUCN World Heritage Panel a progress report was sent to the State Party on 16 December 2015 requesting a more comprehensive and convincing comparative analysis to strengthen the justification of the property's proposed Outstanding Universal Value. An additional request was made of the State Party to justify the decision to create a buffer zone within the boundary of the existing protected areas rather than outside as is normal practice. IUCN invited further dialogue with the State Party on these matters to provide additional detailed guidance. The State Party responded to IUCN's requests on 09 February 2016.

**c) Additional literature consulted:** Various sources including ASX Release, 18 February 2009. *AXG to acquire highly prospective exploration projects in Turkmenistan*. AXG Mining Limited. West Perth, WA, Australia. Azernews, 27 March 2015. *Belarus builds largest mining, processing plant in Turkmenistan*. Downloaded from <http://www.azernews.az/region/79498.html> on 28 October 2015. BirdLife International, 2015. *Important Bird Areas factsheet: Koytendag*. Downloaded from <http://www.birdlife.org> on 19 October 2015. Central Asia Newswire, 20 March 2011. *Belarus to build potassium processing plant in Turkmenistan*. Downloaded from <https://charter97.org/en/news/2011/3/20/36914/> on 28 October 2015. Degtyarev, A. 2015. *Hydrogeology Koytendag karst massif and its foothills*. Report of a RSPB expedition to Koytendag, n.p. Esri, DeLorme, FAO, USGS, NOAA, 2015. *Centres for Plant Diversity*. Downloaded from <http://www.arcgis.com/home/webmap/viewer.html?layers=29673486d08b41a2bea0a3e19d5c573e&useExistin g=1> on 19 October 2015. Esri. Janserikova, A. 2009. *Support to the implementation of the CBD Programme of Work on Protected Areas in Turkmenistan (socio-economic aspects)*. Report produced within the framework of UNDP/GEF Project (in Russian). Magin, C. 2005. *World Heritage Thematic Study for Central Asia. A Regional Overview*. Gland, Switzerland. Michel, S. and Rosen Michel, T. 2015. *Capra falconeri*. The IUCN Red List of Threatened Species 2015: e.T3787A22145706. Downloaded from

<http://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T3787A22145706.en> on 21 October 2015. Pereladov, M. and A. Degtyarev, 2015. *Hydrology and Hydrobiology of Site, Geological Connectivity, Speleological Connectivity, Historical Context*. Report of a RSPB expedition to Koytendag, n.p. Sket, B. 2015. *Koytendag Expedition of RSPB*. N.p. Stoev, P. 2015. *Report from the RSPB Field Mission to Koytendag State Nature Reserve - Caves and Sinkholes*. N.p. Williams, P. 2008. *World Heritage Caves and Karst*. Gland, Switzerland: IUCN. 57pp. WWF, 2015. *Central Asia: Southern Turkmenistan and northern Iran*. Downloaded from <http://www.worldwildlife.org/ecoregions/pa1008> on 21 October 2015. Chemonics International Inc. (2006). *Biodiversity Assessment for Turkmenistan: Task Order under the Biodiversity & Sustainable Forestry IQC (BIOFOR)*, USAID contract number: LAG-I-00-99-00014-00. Critical Ecosystem Partnership Fund (CEPF) 2015. *Biodiversity hotspots: Mountains of Central Asia*. Downloaded from <http://www.cepf.net/resources/hotspots>, accessed in October 2015.

**d) Consultations:** 6 desk reviews received. The mission met with the Turkmenistan National Commission for UNESCO; senior officials from the Ministry of Nature Protection of Turkmenistan and with representatives from the Ministry's National Institute of Desert, Flora and Fauna. Meetings were also held with the Director of the Koytendag State Nature Reserve, other protected area staff and technical specialists. The mission further consulted with the Royal Society for the Protection of Birds (RSPB), local stakeholders and community representatives including livestock and farming associations; local school teachers; and Lebaptourism (representing the regional tourism sector).

**e) Field Visit:** Sarangoo Radnaaragchaa and Remco van Merm, 4-10 October 2015

**f) Date of IUCN approval of this report:** April 2016

## 2. SUMMARY OF NATURAL VALUES

The nominated property Mountain Ecosystems of Koytendag (MEK) is located in the extreme southeast of Turkmenistan within the Central Asian region. MEK borders neighbouring Uzbekistan and covers a total area of 93,343 ha, consisting of one State Nature

Reserve (zapovednik) and three contiguous State Sanctuaries which are designated under Turkmenistan law as Wildlife Sanctuaries (zakazniks). The Koytendag State Nature Reserve (SNR) is categorized as an IUCN Protected Area Category Ia and the three Sanctuaries as Category IV. The nominated area is bound to the west and south by a buffer zone of 1-3 km in width, with a total size of 18,112 ha. It should be noted that the buffer zone has in many areas been designated inside the boundaries of the Sanctuaries, effectively reducing the size of the nominated property. Table 1 provides the breakdown of protected areas comprising the nominated property.

Protected area	Size (ha)
Koytendag State Nature Reserve	27,139
Hojapil State Landscape and Paleontological Sanctuary	26,046
Hojagaravul State Sanctuary	16,011
Garlyk Wildlife State Sanctuary	24,147
<b>TOTAL</b>	<b>93,343</b>
Buffer zone	18,112

**Table 1** Protected areas making up the nominated property of MEK

MEK includes the mountain ecosystems of the ridges of the Koytendag massif and its spurs and spans an elevational range from 380 - 3,139 m asl. Its eastern boundary follows the crest of the main ridge which coincides with the international border between Turkmenistan and Uzbekistan. Koytendag SNR was established in 1986 and protects mountain ridges and deep canyons which coincide with the folded structures represented by the system of synclines and anticlines. The varied relief consists of eroded valleys and canyons combined with terrace and karst. The Hojapil Sanctuary, also created in 1986, protects Pistachio (*Pistacia vera* - NT) and Juniper Forests (*Juniperus seravschanica* - NE), two plateaux of dinosaur footprints as well as the habitats of various ungulates, predators, reptiles and birds. The 'Kyrk gyz' canyon, 'Ketde Kol', 'Horjun Kol' and 'Aygyr Kol' karst lake systems are also found within this protected area. The Hojagaravul Sanctuary was created in 1990 to protect and preserve the landscape and geological features of the Koytendag massif, especially the Daraydere and Hojagaravul dere canyons as well as protecting forest and grassland systems which provide habitat for key species such as Markhor (*Capra falconeri heptneri* - NT) and Urial (*Ovis orientalis bocharensis* - VU). The last of the protected areas which makes up the nomination is the Garlyk Sanctuary, created in 1986. The Garlyk Sanctuary is mostly a semi-desert environment established to protect characteristic ecosystems including several rare endemic species of plants and animals in the southern part of the mountains.

MEK consists of a distinct uplifted Jurassic limestone massif, a remote western outlier of the Gissar ridge of the Pamir-Alay mountain system. The Pamir Mountains lie at the centre of the 'Pamir Knot', the term used by geographers to describe the tangle of the highest mountain ranges on the Eurasian continent. Huge tectonic forces stemming from the collision of the Indian-Australian plate with the Eurasian Plate have

progressively thrown up the Himalaya, Karakoram, Hindu Kush, Kunlun and Tien Shan mountain ranges – all radiating out from the Pamir Mountains. The mountains are mainly composed of Cretaceous and Jurassic sediments represented by limestone, sandstone, gypsum and conglomerates. The rugged inclined plateau of the MEK is dissected by many spectacular long, deep gorges or canyons (many more than 100 m deep), with steep towering walls and plunging waterfalls. In the lower parts of the western slopes of the Koytendag ridge, the landscape is dominated by steep escarpments and cliffs (cuestas), for example the valleys of the Koyten, Kamprek and Govurdak Rivers. In the central section of the Koytendag ridge, there is an extensive area of very steep-sided, winding valleys bordered by a karst landscape with numerous sinkholes and areas of subsidence.

The region's climate is characteristically continental and influenced by the surrounding system of deserts and mountains. MEK experiences lower temperatures than the surrounding plains and significantly higher levels of annual precipitation. In this arid region, MEK provides an important source of surface and underground water.

Although not nominated under criterion (viii) the nomination file includes much reference to geological values. These are framed within the justification for criterion (vii) which emphasizes geological features (karst and cave formations and dinosaur ichnites). The geological values are also included in the justification for criterion (ix) which refers to the geological distinctiveness of the nominated property compared to other Central Asian fold montane systems. An extensive complex of over 300 interconnected karst caves and associated cave formations or speleothems exists, with a network of subterranean watercourses and associated sinkholes and springs. The caves are likely to support a distinctive cave fauna and the nomination contends that the cave systems are considered to be among the most important in Eurasia.

MEK includes a range of landscape types including scree and rocky areas, alpine meadows, juniper forests, grasslands, semi-arid and desert systems. The nominated property lies at the intersection of three biomes, the Eurasian high mountains (Alpine and Tibetan), the Irano-Turanian mountains and the Sino-Himalayan temperate forests. MEK's floral values are noteworthy with 982 higher plant species recorded within the nominated property. 48 plant species are endemic to the property and 135 species are Pamir-Alay endemics. MEK contains high numbers of medicinal plants with some 242 species noted in the nomination. In addition there are 124 recorded species which are the wild relatives of commercial plants. The nomination indicates that MEK contains just under 5% of Turkmenistan's plant species. Despite this it goes on the note that "very few of the species recorded from the property are included in the IUCN Red List and hence it is not possible to ascribe an international threat status to the majority". The nomination contends that those plants limited to the Koytendag should merit a higher IUCN threat category than Least Concern and

notes that “nonetheless a handful of species from the property combine a wider international range with being near threatened or vulnerable and decreasing according to the IUCN. The most prominent species in this category are certain fruit/nut trees: Walnut (*Juglans regia* - NT), Pistachio (*Pistacia vera* - NT) and a type of Almond (*Amygdalus bucharica* - VU), all of which include the mountains of Turkmenistan in their native range.”

Among the fauna, the nomination reports 25 species of mammal, 213 birds, 34 reptiles and 2 amphibians, 10 fish species and more than 300 species of invertebrates. The Ministry of Nature Protection notes that MEK occupies less than 5% of the territory of Turkmenistan but contains two thirds of the country's ground vertebrates. A number of species are endemic or globally threatened, including a sizeable population of Markhor estimated at over 800 in 2013. Among the birdlife, the nomination reports some 50 resident species, 102 breeding migrants (including 28 wintering), 56 migratory species (including 9 wintering) and 5 occasional migrants/vagrants. Endemic and globally threatened species include the Urial (*Ovis orientalis* -VU), Egyptian Vulture (*Neophron percnopterus* - EN), Saker Falcon (*Falco cherrug* - EN), Greater Spotted Eagle (*Aquila clanga* - VU), Eastern Imperial Eagle (*Aquila heliaca* - VU), Pallas's Fish Eagle (*Haliaeetus leucoryphus* - VU), Starostin's Loach (*Troglocobitis starostini* - VU), and Predatory Bush Cricket (*Saga pedo* - VU).

IUCN's evaluation has revealed some discrepancies within the species data. For example Birdlife International lists some 144 species of birds in this region, a figure well below the 213 noted above (which is quoted as an unpublished {pers com} reference); and the nomination incorrectly lists the Markhor as Endangered on the IUCN Red List when it is considered Near Threatened (IUCN Red List 2015).

As is commonly the case in Central Asia, many localities within the nominated property and its surroundings are considered sacred by the local populations. Kyrk gyz grotto is the most notable of sacred sites with its multitude of colourful prayer cloths suspended from the cave ceiling. Settlements are few and far apart, and none are located within the boundaries of the nominated property. Note the design of the buffer zone is such that it excludes Sayat and Hojapil villages from the property, but to all intents and purposes these two villages can be considered to be located within the property. The nominated property also includes a few small agricultural fields from subsistence farms, and the sanctuaries are traditionally the grounds used by herders to graze their sheep.

### 3. COMPARISONS WITH OTHER AREAS

The Mountain Ecosystems of Koytendag has been nominated under criteria (vii), (ix) and (x). To supplement the comparative analysis within the original nomination, the State Party has provided additional analysis in its advice of 09 February 2016.

This provides some clarifications on a number of points as well as additional comparison of biodiversity values and a supplementary comparison on geological and palaeontological values.

The original nomination dossier did not undertake comparative analysis of any elements of criterion (vii), nor of geological or palaeontological values which are included in the nomination as part of the justification for this criterion. In supplementary information some further comparison was made with other criterion (vii) inscribed areas displaying similar characteristics to Koytendag. The justification for criterion (vii) highlights a number of features that are considered to contribute to its natural beauty. The altitudinal range of 3000 meters includes Turkmenistan's highest peak, Ayry Baba however, this cannot be considered exceptional on a global scale, either on the basis of maximum altitude or altitudinal range. The many gorges that dissect the landscape are certainly visually attractive, with Daray dere the longest (28 km) and deepest (300 m). However, these gorges cannot be considered to be exceptional on a global scale. For example, Tajik National Park (Tajikistan) includes many gorges that are much deeper than those present in the nominated property. The Umbar dere waterfall, the highest waterfall in Turkmenistan, cannot be considered globally outstanding with a height of only 25 meters and only seasonal flow. From an aesthetic standpoint the huge complex of caves is not easily appreciated by the casual visitor. Although the known cave system is reported to be some 64 km long, there are many other cave systems in the world that are longer than that, several of which are represented on the World Heritage List, including Mammoth Cave (Mammoth Cave National Park, USA), which at more than 643 km is the longest known cave system in the world. Other cave systems such as those in Phong Nha-Ke Bang National Park (Viet Nam) are larger in scale and more impressive in terms of criterion (vii).

MEK also includes dinosaur ichnites as part of the proposed justification for criterion (vii). In that regard, the World Heritage Committee's consideration of three recent nominations provides a clear framework for the evaluation of this aspect of the nominated property, namely the Dinosaur Ichnites of the Iberian Peninsula in 2006 (Spain only) and 2010 (Portugal, Spain), Cal Orck'O (Bolivia) in 2008, and the Korean Cretaceous Dinosaur Coast (Republic of Korea) in 2009. None of these nominations, which have much more extensive fossil site values than the nominated property were inscribed, and all three IUCN evaluations (IUCN 2008, 2009, 2010) pointed to the difficulty of inscribing fossil sites based on ichnites alone. Furthermore, the IUCN (2006) evaluation of Spain's nomination noted that fossil localities have consistently been assessed under criterion (viii) alone.

The caves of MEK are likely to have internationally important records (in speleothems) of the region's palaeoclimatic history, but that is not considered to justify Outstanding Universal Value because the same can be said for many other places, and nominations considering such values have also previously not been

inscribed. The subterranean biology is likely to be the most important aspect of the karst, however little is known of this.

Regarding biodiversity values, the nomination included a simple comparative analysis focusing the analysis on several other inscribed Central Asian World Heritage properties including Tajik National Park, Tajikistan; Golden Mountains of Altai, Russian Federation; Xinjiang Tianshan, China; Saryarka – Steppes and Lakes of Northern Kazakhstan, Kazakhstan; and Uvs Nuur Basin, the transnational site between Mongolia and Russia. It also compared MEK against several Tentative listed properties including Badhyz Grassland Ecosystem also in Turkmenistan; the Western Tien Shan, Kazakhstan, Kyrgyzstan and Uzbekistan (currently under evaluation) and Tigrovaya Balka, Tajikistan. In its supplementary information, the State Party elaborated the comparative analysis to include several additional properties. The analysis concludes on two points, first that MEK is “very different to the existing and tentative Natural World Heritage sites in Central Asia and neighbouring areas in Russia and Mongolia” and second on the basis that the “Turanian Province, Cold winter (continental) deserts and semi-deserts biome found at the MEK” is underrepresented on the World Heritage list.

IUCN consider that whilst the analysis assessed a plausible selection of comparable sites, the conclusions which have been drawn are not convincing. For example the comparative analysis notes that “there are few biological or ecological similarities” between the nominated property and Xinjiang Tianshan, although they are located in the same biogeographical province of the Pamir-Tian-Shan Highlands. Also, the comparison with Karatau, Aksu-Zhabagly and Sayram-Ugam, Kazakhstan (part

of the Western Tien Shan nomination) notes that the “fauna ... and flora are very different from that of the Mountain ecosystems of Koytendag”, and then goes on to enumerate a number of mammal and bird species present in the Kazakh site, but in fact several of these species also occur in the Turkmen nominated site.

Tajik National Park (TNP), inscribed in 2013 under criteria (vii) and (viii) includes higher altitudes (in excess of 7,000 m asl) than the nominated property (up to 3,139 m asl). The much larger TNP includes a far greater variety of ecosystems functioning at large scale than those found within MEK. TNP was also nominated for its biodiversity values, but the Committee concluded that the property did not meet criterion (x) due to relatively low species diversity and the fact that the property was home to only a small number of globally threatened species.

Additional comparative analysis on biodiversity has been undertaken in collaboration with UNEP-WCMC. When compared with other sites found in the Palearctic mountains MEK has a relatively low level of biodiversity. Table 2 compares the species richness of MEK against a number of other properties and demonstrates that MEK has lower levels of species across most taxa especially so when compared to sites in the same Pamir Tian-Shan Highlands (Xinjiang Tianshan, Tajik National Park and the Western Tien-Shan). The differences may be the result of different sizes of these properties, although two of these are serial site configurations. In addition MEK does not stand out as exceptional when compared with 14 relevant existing World Heritage for which species numbers were available: natural World Heritage sites and Tentative List sites found in mountain protected areas in the Palearctic realm.

Property, State Party	Udvardy Province	Total area (ha)	Natural WH criteria	Plant species	Mammal species	Bird species	Fish species
Mountain Ecosystems of Koytendag, Turkmenistan	Pamir Tian-Shan Highlands	93,343	(vii)(ix)(x)	982	25	144- 213*	10
Western Tien-Shan, Kazakhstan, Kyrgyzstan, Uzbekistan		528,178	(vii)(x)	>1788 (in one component)	61	316	20
Xinjiang Tianshan; China		606,833	(vii)(ix)	2622	102	370	40
Tajik National Park (Mountains of the Pamirs), Tajikistan		2,611,674	(vii)(viii)	639 – 2100**	33	162	4

\* 144 bird species according to Birdlife International \*\* 2,100 species may be for the region

**Table 2** Comparison of the nominated property with existing World Heritage and Tentative Listed mountain properties in the Palearctic Realm

With respect to the biospeleological values of the area it is clear that there has been limited investigation. However, a 2015 RSPB field mission to the caves and sinkholes of the nominated property, provides additional information including that the species diversity of aquatic subterranean fauna appears to be low; the Vulnerable Starostin’s Loach was found only in Sulyoyuk sinkhole; several species of terrestrial cave fauna were discovered, including some that may be new to science; and the most important cave in terms of its conservation value for cave-dwelling fauna

appears to be Kaptarhana cave, which remains outside the boundaries of the nominated property. There was no comparative analysis for cave fauna included in the original nomination dossier, however, some additional assessment of MEK’s geological (karst) and biospeleological values was provided in supplementary information. This additional analysis reviewed the site against a number of other properties with well renowned karstic values and high levels of diversity and endemism within their cave dependent biodiversity. The comparative analysis emphasises

that species compositions are very different from Koytendag, which is to be expected due to the high level of endemism at each site. The supplementary information notes that the karst cave system of Koytendag is globally important because it has formed in an arid environment, but unfortunately it does not compare the MEK with karst systems in arid environments elsewhere. The mineralogical interest of Gap-Gotan cave is also highlighted, both in terms of the number of minerals, including many that are rare, and the variety of speleothems, but as noted above these values are not a sufficient basis for Outstanding Universal Value.

As outlined above the nominated property does not stand out when compared with the two existing World Heritage properties (Xinjiang Tianshan and Tajik National Park) as well as the Western Tien-Shan (currently under evaluation) all within the same Pamir Tian-Shan Highlands province. The comparative data and spatial analyses do not at this point provide a compelling case for the MEK meeting criterion (ix) on the basis of ecosystem diversity and function. The relatively lower levels of endemism in the nominated property suggest that these other sites in the same biogeographic province offer better examples of unimpeded evolutionary processes. This is reinforced by the fact that MEK is significantly smaller in area than these comparable sites and includes disturbed areas within the Sanctuaries (see below).

In regard to criterion (x) the nominated property lies at the intersection of three biomes and as such supports high levels of biodiversity. However, very few of the plant species recorded in the nominated property are considered globally threatened on the IUCN Red List. It is important to note however that there are gaps in the IUCN Red List particularly among plant species. The nominated property does not overlap with any protected area with a high irreplaceability score meaning it is not considered one of the most critical global sites for the conservation of threatened species. MEK does not correspond to any Alliance for Zero Extinction (AZE) site but it does overlap with the Koytendag Important Bird Area (IBA) in recognition of its importance to several species of birdlife. MEK contains fewer endemic plant species (48) compared to Xinjiang Tianshan in China (118) although the latter is much larger than MEK. Karatau State Nature Reserve within the Western Tien-Shan (currently under evaluation) has very high plant species endemism (61 endemic genera of angiosperms) in a smaller area of 34,300 ha. Western Tien-Shan is reported as potentially being one of the most species rich sites in the Pamir-Tien-Shan Highlands province with estimates noting that close to half of the species recorded within the region are endemic to Middle Asia. Within Turkmenistan there appear to be areas with comparable or even higher levels of endemism than MEK. For instance studies in Kopetdag in the south have concluded it has the highest percentage of endemics (19.5%- 332 out of 1,700 plant varieties) for mountain regions in Central Asia.

The area of the nominated property (noted under a previous name: Kugitang) is evaluated in the 2005

IUCN World Heritage Thematic Study on Central Asia as one of 26 sites in this region with possible potential as natural and mixed World Heritage Sites. Koytendag/Kugitang is noted as one of four sites within Turkmenistan. However the nominated property was not selected as one of the sites with higher potential for meeting World Heritage criteria, and one different site in Turkmenistan (Badkhyz) was included within the final six sites in Central Asia identified as meriting consideration for nomination as natural World Heritage Sites. IUCN notes that the thematic study provided an overview of potential World Heritage candidate sites in Central Asia. The additional evaluation of this nominated property has deepened the analysis of the MEK's values and in this instance has not strengthened the case for Outstanding Universal Value.

In conclusion the natural features/phenomena and scenic/aesthetic values of MEK are not considered to be globally exceptional and therefore do not meet criterion (vii). Whilst there is more potential for the biospeleological values to be of greater significance these have not been analysed within the nomination or subject to any comparative analysis to justify a claim for Outstanding Universal Value.

The biodiversity values of MEK appear stronger under criterion (x) than (ix) in relation to plant diversity, however, in relative terms the values of the nominated property are lower when compared to other sites within the same biogeographical province (namely Xinjiang Tianshan in China, Tajik National Park in Tajikistan and the Western Tien-Shan complex in Kazakhstan, Kyrgyzstan and Uzbekistan). MEK displays lower levels of overall species richness, levels of endemism and numbers of globally threatened species. MEK does not coincide with one of the world's most irreplaceable protected areas for threatened species nor does it emerge as a Central Asia Regional priority as a candidate for the World Heritage List. In fact another site in Turkmenistan was considered to have greater potential in this regard.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

Koytendag SNR and the three Sanctuaries which constitute the nominated property, as well as the buffer zone, are all state property by virtue of the Constitution of Turkmenistan which controls all natural resources in the country including those within specially protected areas.

The core part of the nominated site, Koytendag SNR, and the adjoining Hojapil, Hojagaravul and Garlyk Sanctuaries were formally established by the "Decree of the Council of Ministers of Turkmenistan". Additionally, Garlyk caves system, Kyrkgyz, Daraydere, Umbardere, Hojapil, and Bulakdere valleys were listed as natural monuments in 1992 by Presidential decree. The protection regime for the SNR and three Sanctuaries is regulated by a number of laws, codes and regulations including the Law on

Nature Protection; Law on Specially Protected Nature Territories; The Forest Code; Law on Protection of the Fauna; Law on Protection of the Flora and the Provisions for each of the protected areas approved by the Minister of Nature Protection. The above-mentioned laws were adopted in early 1990, but they have been amended recently and have significantly improved the legal framework for protected area management, conservation and rational use of natural resources in the country.

According to the Law on Nature Protection, specially protected areas include: nature reserves, biosphere reserves, national parks, sanctuaries, natural monuments, natural territories for recreational purposes, botanical gardens and zoological parks. Koytendag SNR has the strictest protection regime in Turkmenistan, which corresponds to IUCN Category Ia – Strict Nature Reserve. Hojapil, Hojagaravul and Garlyk State Sanctuaries were established as wildlife sanctuaries (comparable to IUCN category IV) and are managed with an emphasis on wildlife protection and the preservation of paleontological, geological and mineralogical formations.

Local communities use the Sanctuaries mostly for livestock grazing, collection of medicinal plants and tourism-related activities. Livestock grazing is formally allowed within the Sanctuaries, but is strictly prohibited within the Koytendag SNR. There are no available statistics on the number of livestock in the areas adjacent to the nominated site. However, the statistics for the entire Koytendag district shows that the number of livestock has been doubled in the last 10 years. Since 2009, the Government is pursuing the national policy to increase livestock numbers.

IUCN considers that the protection status of the nominated property meets the requirements of the Operational Guidelines, but is concerned, as per the below analysis, regarding the approach to the buffer zone areas which could reduce the overall level of protection of the existing protected areas by in some cases creating buffer zones within their boundaries.

## 4.2 Boundaries

The majority of elements and processes relating to the significant natural values of the MEK are included in the nomination, however there are a number of serious concerns that the evaluation has noted concerning the design of this site.

The boundary of the nominated site in the area immediately north of Daraydere (east of Bazardepe village, between the boundaries of Hojagaravul and Hojapil Sanctuaries) excludes an area possibly due to the presence of settlements and/or farms. However, according to the vegetation map provided in the nomination dossier, this area includes “woodland and scattered scrub”, “mid-level grassland”, “lower level grasslands”, and “semi-arid grassland and semi-desert”, with no obvious gaps in contiguity or connectivity with the nominated property. The exclusion of this area from the nominated property is therefore questionable, and draws into question the

wholeness of the design in ensuring all attributes are included in relation to criteria (ix) and (x). As has been noted above, the Kaptarhana Cave, which several reviewers contend is the most important for conservation of cave-dwelling fauna, also appears to be a significant omission as it is located outside the boundaries of the nominated property, in fact it is not included in any protected area.

The field mission noted that rather than adding a buffer zone outside the existing boundaries of the protected areas it was designated within those boundaries in an attempt to avoid conflict with local communities. Supplementary information (see below) has clarified this to some extent, however, the decision to excise buffer zones from parts of the property effectively reduces its size and viability. The buffer zone configuration has also resulted in three anomalies:

1. A narrow protrusion of the nominated area exists on the north-west boundary of Hojapil Sanctuary. The original design of the boundary of Hojapil Sanctuary was stated to follow terrain features (foothills). The decision to excise the buffer zone from the original sanctuary boundaries has caused this protrusion to become exceedingly narrow, questioning the value of retaining it in the design of the nominated property;
2. A long linear intrusion of the buffer zone into the nominated property along the Hojapil valley intends to exclude the villages of Sayat and Hojapil, but effectively divides the Hojapil Sanctuary into two parts, connected only through a narrow section between the spring of Bashbulak and the Uzbek border. Despite the presence of these villages and their farm lands, the exclusion of this valley is not justified from the point of view of integrity, in particular connectivity, as it is unlikely that wildlife would avoid the valley in moving between different parts of the nominated property;
3. At the southern extremity of Koytendag SNR the buffer zone was designed to exclude a gypsum quarry that supplies a nearby cement factory. Due to a legal requirement for buffer zones to have a minimum width of 2 km, this has resulted in a square-shaped exclusion from the protected area that does not appear to be justified from the point of view of values or integrity.

In supplementary information the State Party has provided additional advice on the buffer zones. This suggests that a variable approach was taken, in some cases the buffer zones were excised from the protected areas but in others they were not. In a number of areas the Sanctuaries have been reduced in size to accommodate a buffer zone as a means to avoid conflict with local communities. This is the case in parts of Hojapil Sanctuary. In other cases the buffer zones were designated outside of the protected areas for example in Koytendag SNR and Hojagaravul Sanctuary. As for Garlyk Sanctuary, it is confirmed that the buffer zone is entirely designated inside the original boundaries of the protected area. However, the justification for that measure does not appear to

relate to the presence of villages. The supplementary information also notes that the size of Garlyk Sanctuary was reduced to focus on the mountain ecosystems and exclude the desert and semi-desert areas. IUCN notes that according to the vegetation map on page 42 of the nomination dossier, the entire Garlyk Sanctuary is classified as semi-arid grassland and semi-desert. Furthermore, the reduction in size from 40,000 ha in 1990 to 24,147 ha in 2014 represents almost a halving of the size, which does not appear to be solely due to the designation of the buffer zone inside the boundaries of the Sanctuary.

The supplementary information also provides a list of buffer zone regulations indicating measures to protect values from controlled human use. It is not clear if this offers any added protection to the nominated area over and above that provided by the Sanctuaries themselves. In fact it is that likely the protective regime is weaker in the buffer zone areas. IUCN further notes a number of integrity threats regarding the three Sanctuaries (see 4.5 below) and consider that the Sanctuaries effectively serve as a larger buffer zone to the more highly protected and ecologically intact Koytendag SNR. In this case though, the core area of the SNR represents only 27,139 ha, an area which is not likely to be large enough to support the ecological dynamics required under criterion (ix).

Finally it should be pointed out that, other than the buffer zone regulations above and the legal distinction between SNR and Wildlife Sanctuary, there is no internal management zoning scheme documented within the protected areas.

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

### 4.3 Management

The Koytendag SNR is under the jurisdiction of the Ministry of Nature Protection of Turkmenistan and has its administrative headquarters located in Bazardepe Village, Koytendag etrap (district). The administration for the SNR also holds responsibility for the management of the State Sanctuaries, buffer zone and fire protection corridor around the SNR, in other words for the nominated property in its entirety. The administration is also responsible for one additional protected area, Hojaburjybelent Wildlife Sanctuary, located further west.

Until 2014, there was no comprehensive management plan for the Koytendag SNR and the Sanctuaries which comprise the nominated property. The work of the management staff was guided by the three main objectives within the legal decree establishing the protected areas and executed through annual workplans approved by the Ministry of Nature Protection. The annual workplans directed a range of activities covering law enforcement, fire protection, scientific research and public awareness. In 2014, a management plan was developed with the support of RSPB; however at the time of this evaluation this is awaiting Ministerial approval. The management plan

which was appended to the nomination summarizes and evaluates relevant statutory, environmental and socio-economic information relating to the Reserve. The draft plan defines a vision and management for the reserve, analyses threats, provides a stakeholder analysis and proposes activities linked to a budgeted cost plan. The plan specifies objectives centred on the protection of key values (biodiversity, geodiversity and water resources); the development of nature-based tourism and measures to improve the economic livelihoods of local people. Other objectives relate to education, World Heritage promotion and effective management. Whilst noting that the management plan remains in draft form IUCN considers that it provides an appropriate level of detail to guide the management of the nominated property.

The Koytendag SNR has 43 staff (33 permanent and 10 contract), structured into four departments - administration, scientific, protection (with 19 rangers), and wildlife management departments. Ten contract maintenance and technical staff support the management of the property. As noted above these staff are responsible for the nominated property as a whole. The staff are adequately qualified and trained across a range of technical areas including reporting and monitoring of wildlife (particularly birds and their habitats), camera trapping, bird, plant and mammal surveys, use of GPS and management plan preparation. The majority of staff, especially rangers, are recruited from local communities, who have good knowledge of the surroundings. Nineteen out of 43 staff have tertiary qualifications and two staff from the scientific department hold higher professional degrees. Patrolling and monitoring activities by rangers are mostly concentrated on the SNR, the core zone of the property. As expressed by the Reserve management there is a need to increase number of rangers to provide better monitoring in the Sanctuaries and buffer zone areas.

The total budget of the SNR for 2013 was over 242,000 USD. The budget for the last 5 years has been gradually increased, however, despite the increase, funding still does not provide adequate resources to carry out monitoring, patrolling and other conservation activities especially in the Sanctuaries. The recently elaborated management plan for 2015-2019 has an annexed preliminary cost plan for the next five years. Once approved the management plan will determine the property's budget and is considered to provide a satisfactory level of financial support for the nominated property. Whilst noting that the management plan awaits Ministerial approval it provides an adequate framework to protect the property.

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

### 4.4 Community

There are no human settlements in the territory of the nominated property. Two villages (Sayat and Hojapil) are within the buffer zone, however, as noted above

the buffer zone has been excised from the protected areas, hence these are effectively inside the protected area. The other villages are either close to the boundary or in the immediate vicinity of the buffer zone. Most villages are characterized by household-size subsistent farming of vegetable, wheat, fruits and nuts. In addition, households are leasing land from farm enterprises, called “peasant associations” for cotton, vegetable and wheat plantations. The drinking water for some settlements and water for irrigation and domestic livestock is supplied from springs and streams from Daraydere. The declaration of a territory as a Sanctuary (including water areas) does not entail the withdrawal of land and water access rights for respective owners and users.

Local stakeholders, including the representatives of peasant associations, have been consulted in the course of preparation of the management plan. However, the evaluation mission was informed that there is no formal agreement between the associations and the property's management authority on the regulation of pasture management to avoid overgrazing in critical wildlife habitats and to avoid other wildlife-livestock conflict.

The mission noted that whilst local people were aware of the nomination process, it was not clear to what extent consultation occurred. The process of engagement has been beneficial and may trigger increased stakeholder involvement in the future management of these protected areas. The IUCN field mission did not ascertain any expected impact on the cultural rights of local communities, since pilgrimage sites and worshipping places are located within the Sanctuaries and access to these locations is not controlled.

#### 4.5 Threats

In general the nominated property has not noticeably suffered from past development. There are nonetheless a number of legacy impacts from past landuse and some neglect is evident in parts of the property. For example the only current access to Gapgotan cave is through an abandoned Soviet-era mine shaft. The field evaluators also observed litter in a number of the gorges visited, especially in Kyrk Gyz and Daraydere. More notable is the visual impact from gas and water pipelines, respectively in Hojapil valley (buffer zone) and in Daraydere gorge. These pipelines are almost entirely above ground and are not hidden by rocks or vegetation. The water pipeline in Daraydere gorge supplies a number of villages with drinking water, and thus performs an important service. However, its exposed nature is to the detriment of the aesthetic value of the gorge, and of visitor experience. This is exacerbated by the fact that old, unused and damaged sections of pipeline and discarded parts of a diesel pump are strewn across the floor of the gorge, with no evidence of efforts to remove them.

Several other threats of note exist for the MEK. There is a large potassium plant under construction near Garlyk and Karabulak villages. The potassium deposit

at Garlyk is believed to hold 700 million tons of potassium salts and the project would create the largest processing plant for the production of potash fertilizers in Turkmenistan. Although the plant is not yet operational, it appears to already be having impacts on the nominated property, as the gypsum required for its construction is quarried from a location in close proximity to Sulyoyuk sinkhole (the only sinkhole where the Vulnerable Starostin's Loach is found). Further south, between the Gaynarbaba spring and the intersection of the boundaries of Koytendag SNR and Garlyk Sanctuary lies a cement factory, also with an associated gypsum quarry. The impacts from these extractive activities on the conservation values are poorly understood as they have not been studied. Comprehensive Environmental Impact Assessments will be required to assess those impacts, especially impacts on the still poorly studied cave system and its hydrogeology. Information found online suggests that AXG Mining Limited has been awarded a mining license in the Koytendag region that appears to fully include the nominated property.

A further threat stems from housing and urban areas. Although settlement density is currently low, and no settlement is present within the boundaries of the property (note however Sayat and Hojapil villages in the buffer zone), pressure from urban development is likely to increase considerably in the future, which is related to the ongoing construction of the potassium plan near Garlyk and Karabulak villages. This is likely to be accompanied by associated population growth.

Poaching and collection of plants is noted as an issue in the nomination file, and data is provided on the number of infringements recorded between 2008 and 2013. The apparent recorded increase in infringements as of 2011 is stated to be a result of improved monitoring. However, this data does not permit an evaluation of which species are most affected. High fines apply to poaching of Markhor and Urial, and for the collection of plants that are included in the Red Data Book of Turkmenistan. Collection of medicinal plants is traditionally practiced, but this was stated not to be problematic as few people have the traditional knowledge, and the commercial sale of medicinal plants is considered a cultural taboo. In addition, local women sell snake and wolf oil to tourists and see this practice as an alternative source of income.

The nomination notes fire as a low level threat and refers to fire management measures including a fire prevention strategy and a fire corridor. The evaluation mission concluded that fire is not a significant threat to the property's values and the management strategies in place appear adequate.

Two of the more significant issues in the MEK relate to increasing tourism demand and its potential impact and to overgrazing within the Sanctuaries. Current tourism activity in the Koytendag SNR is controlled and low. However visitation to the Sanctuaries is uncontrolled and no data is available on visitor numbers. The most visited areas appear (on the basis of visible signs) to be Kyrk Gyz grotto and Hojapil Dinosaur Plateau. The nomination file indicates that

tourism development is the greatest threat to the property. It also refers to a number of tourism development plans that could have a negative impact on the nominated property, including the construction of tourist facilities at Umbardere, Daraydere, Koyten, Gaynarbaba and Bazardepe (all locations are either outside the nominated property or in the buffer zone), and a cable car between Kyrk Gyz and Hojapil Dinosaur Plateau (located within the property, in Hojapil Sanctuary). In the absence of a mechanism to control visitor numbers, these developments could have significant impacts on the conservation values of the property. The cable car in particular could become a concern, as it would greatly increase access to the dinosaur plateau which is not sufficiently protected against inappropriate visitation, and is already impacted by vandalism and a combination of natural (water) and human (walking) erosion. A cable car would likely also have a significant visual impact on the landscape.

Large areas within the Sanctuaries have been heavily impacted by grazing, which is permitted in these protected areas. In the affected areas, tracks from herds of sheep are omnipresent. There is a complete absence of grasses and vegetation has been reduced to less palatable shrub. Some small localized areas are even worse affected, with no vegetation left. The SNR, where grazing is prohibited, shows no signs of grazing. Nevertheless there are reports of some illegal grazing also within the SNR. Given that the Sanctuaries have traditionally been the grazing grounds for local herders, and given the national policy to increase numbers of livestock, the effects of overgrazing are not easily remediated, and are likely to continue to impact the values of the property in relation to criteria (ix) and (x).

In conclusion IUCN considers that whilst the protection and management requirements of the Operational Guidelines are met the integrity requirements of the Operational Guidelines are not met.

## 5. ADDITIONAL COMMENTS

### 5.1 Transboundary cooperation

The Koytendag SNR is bordered in the east with Surhandarinskiy Reserve in Uzbekistan, also known as Surkhan Strict Nature Reserve. On both sides there are border patrolling points. Communication between the two reserves takes place at Ministerial level but there is no formal agreement between the two reserves on transboundary management and protection. Collaboration between the two reserves in Turkmenistan and Uzbekistan is important for the contiguity of the landscapes and in particular for the conservation of the transboundary population of Markhor.

## 6. APPLICATION OF CRITERIA

The **Mountain Ecosystems of Koytendag** has been nominated under natural criteria (vii), (ix) and (x).

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

IUCN considers that any possible justification for the inscription of the nominated property under criterion (vii) would have to be based on the diversity of contrasting scenery encountered on a relatively small spatial scale. For the nominated property this diversity of landscapes while typical of the region, cannot be considered an outstanding example of Central Asian scenery, and landscapes of more exceptional aesthetic importance occur elsewhere in the region and on a larger scale, both in terms of area covered and the scale of their features. The nomination proposes a number of other attributes as justification for criterion (vii). These include the diversity of karst caves, speleothems, subterranean watercourses, sinkholes and springs as well as the paleontological values expressed through the dinosaur ichnites. The fossil values of the dinosaur footprints alone do not provide justification to meet criterion (vii). These values should normally be considered in relation to criterion (viii), but it is clear they also do not meet that criterion, based on the past consideration of a number of sites with similar values that were not inscribed.

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

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

In terms of criterion (ix), whilst of notable conservation value, IUCN considers the nominated property does not stand out in terms of biological and ecological diversity when compared with the closest comparative sites: the existing World Heritage properties (Xinjiang Tianshan and Tajik National Park) as well as the tentative listed Western Tien-Shan all within the same Pamir Tian-Shan Highlands Province. Moreover there are other areas within Turkmenistan such as the Kopetdag which are considered to have higher biodiversity value than the nominated property. The relatively lower levels of endemism in the nominated property suggest that these other sites in the same biogeographic province offer better examples of unimpeded evolutionary processes. The nominated property is also significantly smaller in size than other sites within the Pamir Tian-Shan Highlands. The ecological integrity of the nominated property is further compromised by a configuration which has incorporated the World Heritage buffer zone inside the protected areas and by the inclusion of heavily overgrazed areas within the three wildlife sanctuaries. Little is known about the biospeleological values of the nominated property and at this time a case for Outstanding Universal Value cannot be made on the basis of those values. The Kaptarhana Cave which is

recognised as having the greatest potential biospeleological significance in the Koytendag region is not located within the nominated area.

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

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

The Mountain Ecosystems of Koytendag displays lower levels of overall species richness, endemism and numbers of globally threatened species when compared to other areas within the Pamir Tien Shan Highlands such as the existing World Heritage properties (Xinjiang Tianshan and Tajik National Park), the tentative listed Western Tien-Shan and other areas in Turkmenistan such as Kopetdag in the south of the country. The nominated property does not coincide with one of the world's most irreplaceable protected areas for threatened species nor does it emerge within the most recent IUCN World Heritage Thematic Study for Central Asia as a priority candidate for the World Heritage List. A different site in Turkmenistan was considered to have greater potential in this regard. As with criterion (ix) the nominated property's values are also limited by its relative small size; the reduction in size of the nominated area as a result of excising areas within the wildlife sanctuaries to accommodate the World Heritage buffer zone; and the impacts of overgrazing. IUCN recognizes the importance of the property for a range of characteristic Central Asian flora and fauna, and in particular its value as an Important Bird Area affording a critical refuge for a high diversity of birds including birds of prey. However, on balance the comparative analyses clearly point to this property having biodiversity values that are of national and regional significance rather than being exceptional at a global level.

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

## 7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC/16/40.COM/8B and WHC/16/40.COM/INF.8B2;

2. Decides not to inscribe the **Mountains Ecosystems of Koytendag (Turkmenistan)** on the World Heritage List under natural criteria.

3. Encourages the State Party to work, with the support of IUCN if requested, to review other candidate natural World Heritage properties in Turkmenistan, in particular those identified in past global and regional analyses, so as to bring forward a nomination with the best possible chance of success;

4. Recommends the State Party to:

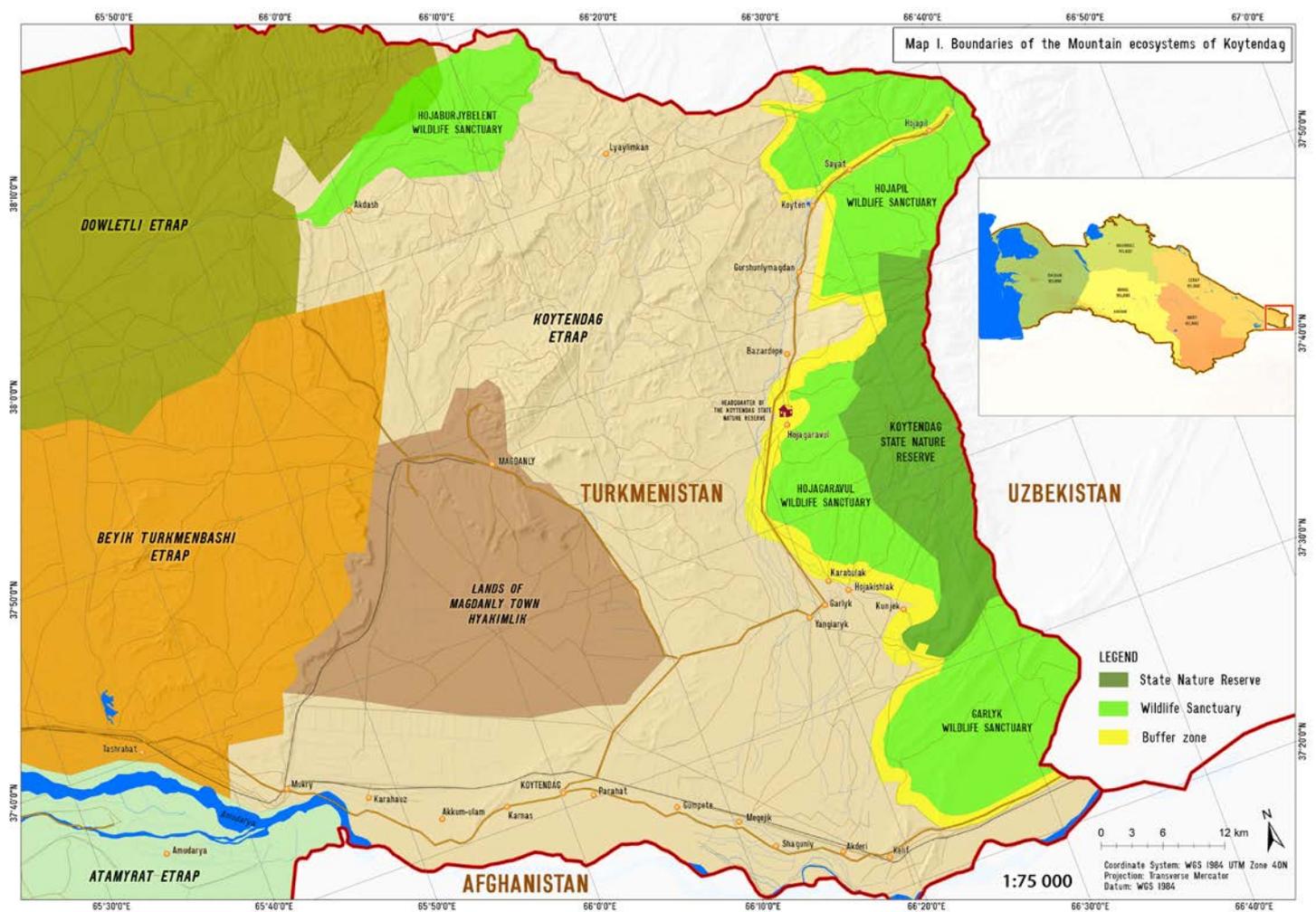
- a) monitor grazing pressures in the designated wildlife sanctuaries to regulate stock numbers and reduce pressure on native vegetation and natural systems;
- b) more effectively plan for increasing tourism demand including the development of appropriately scaled and low impact tourism related infrastructure and ensure that proposals to establish cable car access are subject to careful consideration and rigorous environmental impact assessment;
- c) ensure that no mining prospecting licenses and/or operations will be permitted within protected areas comprising the Mountain Ecosystems of Koytendag, and its buffer zone, and that any mining activity that might impact this site is subject to rigorous Environmental and Social Impact Assessment.

5. Encourages the States Parties of Turkmenistan and Uzbekistan to enhance collaboration in order to improve coordination between Koytendag State Nature Reserve (Turkmenistan) and the adjoining Surkhan Strict Nature Reserve (Uzbekistan), in particular to support improved transboundary management of wildlife populations, such as Markhor, which depend on ecological continuity between these two protected areas.

**Map 1:** Location of the nominated property in Turkmenistan



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

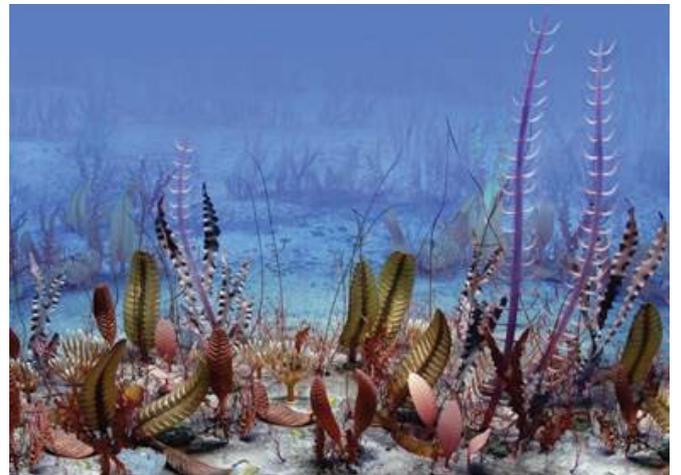




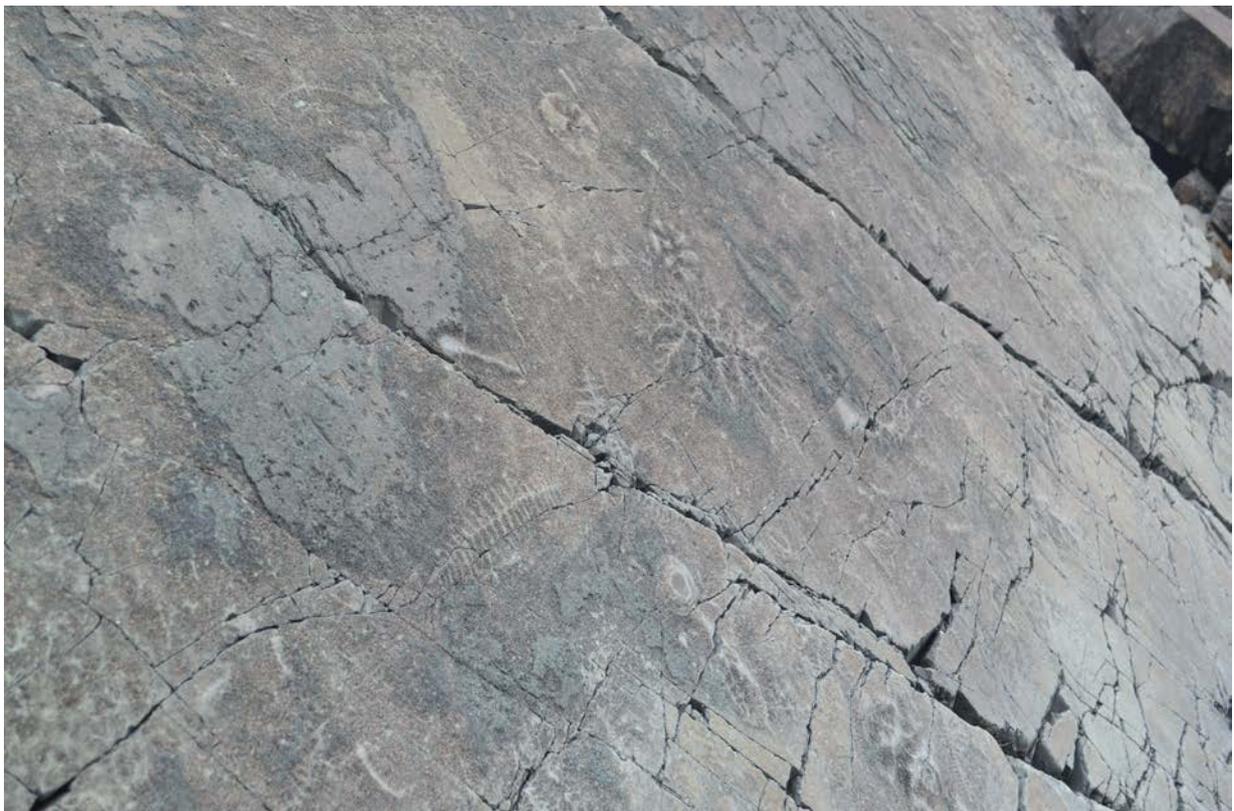
EUROPE / NORTH AMERICA

## MISTAKEN POINT

CANADA



Reconstruction of the Mistaken Point sea floor



Water Cove Surface, *Hapsidophyllas* and *Charniodiscus* - © IUCN Shafeea Mohd Leman



# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## MISTAKEN POINT (CANADA) – ID 1497

**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:** 16 March 2015

**b) Additional information officially requested from and provided by the State Party:** Following the IUCN World Heritage Panel in December 2015 a progress report was sent to the State Party on 16 December 2015 seeking its response on a number of points. These related to any information on recently discovered fossil sites in the vicinity of Mistaken Point and the views of the State Party on the potential to include such areas in future serial extensions to the nominated property should it be inscribed. Additional matters concerned clarifications and rationalization of the boundaries of the nominated property; more information on the anticipated impacts of coastal erosion; and finally views regarding any potential impacts from offshore developments and how these might be mitigated. The information in response was received from the State Party on 22 February 2016.

**c) Additional literature consulted:** Various sources including: Anderson, M.M., and S.B. Misra. 1968. *Fossils found in the pre-Cambrian Conception group of south-eastern Newfoundland*. Nature 220: 680–81. Government of Newfoundland and Labrador. 2009. *Mistaken Point Ecological Reserve Management Plan*. Parks and Natural Areas Division, Department of Environment and Conservation, Deer Lake, NL, 26pp. Government of Newfoundland and Labrador. 2013. *Mistaken Point World Heritage Site Management Plan*. Parks and Natural Areas Division, Department of Environment and Conservation, Corner Brook, NL, 47pp. Liu, A.G., D. and M.D. Brasier. 2012. *A Global Comparative Analysis of Ediacaran Fossil Localities*. UK: Oxford. Narbonne, G.M. 2011. *When life got big*. Nature 470:339-340. Narbonne, G.M. and M. Laflamme 2009. *Neoproterozoic glaciations, oxygenation, and the rise of animals in Avalonian Newfoundland*. NASA Astrobiology Institute Field Trip Guidebook. E.L. Bamforth, G.M. Narbonne, M.M. Anderson. *Growth and ecology of a multi-branched Ediacaran rangeomorph from the Mistaken Point assemblage, Newfoundland*. Journal of Paleontology, 82 (2008), pp. 763–777 A.P. Benus. *Sedimentologic context of a deep-water Ediacaran fauna (Mistaken Point Formation, Avalon zone, eastern Newfoundland)*. Bulletin of the New York State Museum, 463 (1988), pp. 8–9 M. L. Droser and J. G. Gehling. *The advent of animals: The view from the Ediacaran*. PNAS (April 21,

2015) 112 (16): 4865-4870 M.A. Fedonkin, J.G. Gehling, K. Grey, G.M. Narbonne, P. Vickers-Rich. *The Rise of Animals: Evolution and Diversification of the Kingdom Animalia*. Johns Hopkins University Press, Baltimore (2007) M.F. Glaessner. Geographic distribution and time range of the Ediacara Precambrian fauna. GSA Bulletin, 82 (1971), pp. 509–513 M.F. Glaessner. *The Dawn of Animal Life: a Biohistorical Study*. Cambridge University Press, Cambridge (1984) A.G. Liu, D. McIlroy, M.D. Brasier. *First evidence for locomotion in the Ediacara biota from the 565 Ma Mistaken Point Formation, Newfoundland*. Geology, 38 (2010), pp. 123–126 S. B. Misra. *Stratigraphy and depositional history of late Precambrian coelenterate-bearing rocks, southeastern Newfoundland*. Geological Society of America Bulletin 82 (1971):979–988. G.M. Narbonne, J.G. Gehling. *Life after snowball: the oldest complex Ediacaran fossils*. Geology, 31 (2003), pp. 27–30 Seilacher. *Early life on Earth: Late Proterozoic fossils and the Cambrian explosion*. Pp. 389–400 in S. Bengtson (ed.). Early Life on Earth. Nobel Symposium 84. (1994) Columbia University Press, New York. S. Xiao, M. Laflamme. *On the eve of animal radiation: phylogeny, ecology and evolution of the Ediacara biota*. Trends in Ecology and Evolution, 24 (2009), pp. 31–40

**d) Consultations:** 11 desk reviews received. The mission also met with national level representatives from Parks Canada and provincial level Government Ministers from Newfoundland and Labrador; the Provincial Parks and Natural Areas Division (PNAD), staff and community volunteers from the Mistaken Point Ecological Reserve Park; academics, community support organizations and centres such as the Geo Centre and Geo Park, St Johns and the Mistaken Point Ambassadors Inc. as well as other local stakeholders.

**e) Field Visit:** Mohd Shafeea Leman, 28 September – 01 October, 2015

**f) Date of IUCN approval of this report:** April 2016

### 2. SUMMARY OF NATURAL VALUES

The nominated property, Mistaken Point is located along the rugged, windswept south-eastern coast of the Avalon Peninsular in Canada's Newfoundland and Labrador Province. The property comprises a low, narrow, 17-kilometre-long coastal strip stretching from Daleys Point (1 km south of the town of Portugal Cove

South) in the northwest, to just east of Shingle Head (approximately 4.5 kms southwest of Cape Race), in the southeast. The property encompasses a 146 ha terrestrial area with an additional 74 ha buffer zone adjoining its landward margin. Virtually all of the property, plus most of its buffer zone, lies within the Mistaken Point Ecological Reserve (MPER). Mistaken Point itself, the promontory for which the entire nominated property is named, is the most obvious topographic feature within its boundaries.

Apart from a variety of rock platforms and cliff types, other geomorphological features present along the coast are small coves and gullies, larger steep-sided gulches, various headlands, small beaches, narrow sub-vertical slots eroded along faults and joints, reefs, islets, sea stacks, sea caves, and small rock arches. Geologically this coast is composed of Precambrian bedrock unconformably overlain by a late Pleistocene, up to 4-metre thick sheet of unconsolidated, very poorly sorted, granule-to boulder-grade gravel (diamicton) of glacial origin. Ninety percent of the nominated property's shoreline comprises bedrock exposures, while the remainder is occupied by nine cobble-grade gravel beaches, the longest stretch of which is about 375 metres in length. The gently to moderately rolling topography of the MPER is drained by numerous minor streams and six significant, southwest or south flowing. Blanket bogs are common and there are many small ponds.

Mistaken Point has geological links to an ancient landmass once positioned near northern South America, and with abundant evidence of deep-ocean life forms that flourished more than half a billion years ago. The property is nominated for its world renowned fossiliferous middle Ediacaran (580 to 560 million years old) geological succession including the oldest known Ediacara fauna. This comprises a two kilometre thick sequence of sandstones and mudstones most of which are deep marine turbidites, interbedded with thin layers of volcanic tuff that bury thousands of soft-bodied fossils. The fossil horizons within the nominated property lie within five rock formations that span almost the entire Middle Ediacaran Period: the Drook, Briscal, and Mistaken Point Formations of the Conception Group, and the overlying Trepassey and Fermeuse Formations of the St John's Group. More than 10,000 fossil impressions ranging from a few centimetres to 2 metres in length are to be found here including the fossils of 17 species from 14 genera.

The Ediacaran fauna are central to understanding the transition from single-celled to complex multi-celled invertebrates. There are relatively few places on earth where such soft-bodied fossils can be found, because they require special conditions for preservation. Since they have no shells or hard parts they are only preserved in anoxic, quiet-water environments.

The nominated property is put forward as the place that best illustrates the earliest stages in the emergence of biological complexity on our planet. As the nomination puts it the time "when life got big": being the first appearance of abundant and diverse, large and biologically complex organisms on Earth,

580 million years ago. The many thousands of impressions of soft-bodied, centimetre to metre-scale creatures preserved at Mistaken Point document the oldest large and biologically complex creatures known and are generally regarded as including the earliest (stem-group) ancestors of the animals. The nominated property also preserves rare insights into the interrelationships between species thus providing key information about the ecology of these ancestral animals and about the early colonization of the deep-sea floor.

Mistaken Point's fossils range in age from 580 to 560 million years, the longest continuous record of Ediacara-type megafossils anywhere, and predate the Cambrian Explosion (the relatively short evolutionary event during which the fossil record shows that most major animal phyla appeared) by more than 40 million years. Ecologically, Mistaken Point contains the oldest and most diverse examples of Ediacaran deep-sea communities known and the earliest documented examples of ecological tiering and secondary community succession. Other attributes include the first examples of metazoan locomotion, exceptional potential for radiometric dating of the assemblages, and evidence for the role of ancient oxygen levels in the regional and global appearance of complex multicellular life.

Although not nominated for its biological values the glaciated landscapes of Mistaken Point support Arctic alpine moss-heath and bog communities. At least 150 plant species have been recorded within MPER including Balsam Fir (LC), a range of berry-producing plants and various insectivorous plants such as sundews and pitcher plants. Seaweeds thrive in the intertidal and sub tidal fringes. Mistaken Point provides important habitat for a range of birdlife and is recognised as an Important Bird Area, globally significant for congregatory bird species because of its wintering populations of Purple Sandpiper (LC) and Common Eider (NT). More than 180 bird species have been sighted in the area and adjacent waters. The nominated property is also home to a range of terrestrial and marine mammals, fish and insect species typical of the region.

### 3. COMPARISONS WITH OTHER AREAS

Mistaken Point has been nominated under criterion (viii). The nomination dossier includes an excellent comparative analysis which is appropriate in its scope, logical in its methodology and objective in its conclusions. Expert reviewers were in agreement that the comparative analysis was a best practice example, done in a highly scientific and professional manner. The analysis begins by considering all World Heritage listed fossil sites, regardless of age, and considers the relationships to the iconic sites that represent the Cambrian Explosion on the World Heritage List – the Burgess Shale (within the Canadian Rocky Mountain Parks, Canada) and the Chengjiang Fossil Site (China). It documents the iconic significance of the Ediacaran Period in the record of life on Earth, then focuses on Precambrian/Ediacaran/Cambrian sites to

identify a selection of the most significant. Finally, in focusing on the Ediacaran, it first considers all Ediacaran sites, and then narrows them down. Finally, it uses a quantitative method, relying heavily on the IUCN thematic study of fossil sites, to complete the analysis (this includes in Inset 1 of the nomination a review based on the IUCN Fossil Site Evaluation Checklist, which is not reproduced in this evaluation). Comparisons were conducted on 84 valid candidate sites, with representatives from every continent except Antarctica. Based on the analysis, Mistaken Point was ranked first overall, and ranked first (or tied first) in six criteria: fossil abundance, fossil quality, thickness of fossiliferous strata, age of the oldest fossils, degree of site investigation and permanence.

The nomination further benefits from comparative work undertaken in 2012 by two leading Ediacaran fossil experts who analyzed all 109 sites worldwide where Ediacaran fossils have been discovered or were reputed to have been discovered. Through a systematic process of evaluating claims and assemblages for each site, this work ultimately concluded that the Mistaken Point assemblage was the largest and most important.

The analysis notes that there are other well-preserved Ediacaran assemblages but only three other sites preserve the record of later stages of the development of the first animals. These are the Flinders Ranges of South Australia (found at Ediacara Hill from where the period takes its name), the White Sea region of Russia and the very youngest, the Nama region of southern Namibia. Comparative analysis confirms that these other sites are younger and cover a shorter time span than Mistaken Point, but being in shallower water the other sites preserve a greater diversity of fauna. The Newfoundland area records the very first and oldest assemblages. There are three other Ediacaran fossil sites in Newfoundland, i.e. Catalina Dome; Spaniard's Bay region; and Fortune Head, Burin Peninsula which possess fossil assemblages. The State Party in its supplementary information has indicated that these sites do not encompass the stratigraphic entirety of the origin and early evolution of complex multicellular life that is evident in the nominated area. They note that new fossil discoveries are being regularly made and should sites with complementary values be found they would be open to considering further additions to the nominated property should it be inscribed.

In conclusion, the rigorous comparative analysis demonstrates the fundamental significance of the nominated property as an iconic representation of the record of life on Earth, and the best such example to be considered for inclusion on the World Heritage List.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

The property is protected under provincial legislation. Almost all of the property (99.97%) is protected within the Mistaken Point Ecological Reserve (MPER), which was established in 1987 under the Province's

Wilderness and Ecological Reserves Act (WER Act). This Act has very strict provisions to prevent removing, destroying and damaging the nominated property's fossils whilst permitting scientific research and education activities. The Parks and Natural Areas Division (PNAD) of the provincial Department of Environment and Conservation manages the nominated property. The remaining portion of the nominated property (0.03%) in the Watern Cove area is designated as a Crown Lands Reserve under the provincial Lands Act.

The largest part of the buffer zone (92.3%) also lies within the MPER, and is therefore also protected under the WER Act. In Newfoundland and Labrador, there is no requirement to register interests in and/or transactions of interests in private land. The nomination dossier reports on the completion of a process to research and document the possible existence and location of private land claims within the nominated property. No documented private land claims were found, therefore, the nominated property is considered to be provincial Crown land. The buffer zone, for the most part, is also Crown land and the State Party in supplementary information has clarified and confirmed how its design provides an appropriate level of protection and management utility.

The IUCN evaluation mission concluded that all the elements (such as the impressions of various soft bodied organisms) that are fundamental in demonstrating the Outstanding Universal Value of the property remain intact within the nominated area. The WER Act and associated Fossil Ecological Reserve Regulations as well as the MPER Management Plan provide the protection framework which governs the nominated property.

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

### 4.2 Boundaries

The boundaries of the nominated property have been chosen to include all the attributes of Mistaken Point's proposed Outstanding Universal Value. The nominated property spans the coastal profile between ordinary low water-mark and extends inland to an easily identifiable natural feature, the turf edge. The turf edge is the seaward-most extension of contiguous cliff-top vegetation and under the influence of erosion will very gradually recede inland. The property and its values are subject to dynamic erosion and therefore changing exposures, following the examples of past coastal fossil sites at Joggins Fossil Cliffs (Canada) and the Dorset and East Devon Coast (UK). A Fossil Protection Zone overlays the nominated area and extends further landward some 15 meters to account for the retreating profile over time.

In seven locations, the inland boundary of the nominated property does not follow the turf edge due to variations in the terrain for example around the river mouths. In five additional locations, it has been adjusted inland of the turf edge to include rock

outcrops that possess features of proposed Outstanding Universal Value.

The buffer zone is a strip of land 30 metres wide that extends inland from the landward boundary of the nominated property. The buffer zone's shape and size are designed to absorb the effects of anticipated natural coastal erosion for at least several hundred years. There is one location where the buffer zone is wider than 30 metres and another where the defined 'fossil protection zone' is outside both the nominated property boundary and the buffer zone. The State Party has clarified these small variations in boundaries, and IUCN considers that the configuration of the nominated area and buffer zone represents an effective solution to protecting core values and facilitating effective long-term management.

The nominated property is of an adequate size to protect the values. IUCN notes that there is no buffer zone designated seaward however, the State Party has advised that there are no oil/gas or mineral deposits of economic value in offshore areas thus alleviating concerns regarding the potential impact of offshore development. Boundaries are not marked on the ground.

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

### 4.3 Management

As stated above the property is managed by Newfoundland and Labrador Provincial PNAD, a unit of the Department of Environment and Conservation. PNAD staff work in close cooperation with several partners including Cape Race – Portugal Cove South Heritage Inc to protect, present and manage the property sustainably and to enhance tourism experiences and economic benefits for the local community. The evaluation mission noted good relations between the authority and the various stakeholders. In the event that Mistaken Point is added to the World Heritage List, a Mistaken Point World Heritage Advisory Council will be set up to advise on the management of the nominated property. The Council will ensure wide stakeholder engagement and supersede the Mistaken Point Ambassador Inc, an organization which was established in 2013 to pursue World Heritage status.

The MPER Management Plan of 2009 presents clear and appropriate management goals and policies for the reserve. There has also been a specific World Heritage plan prepared in 2013: Mistaken Point World Heritage Site Management Plan which provides guidance within the context of the legally binding reserve management plan. As noted above a Fossil Protection Zone has been established to provide dynamic protection. The Management Plan also proposes the creation of a Scientific Advisory Committee to generate specialist input. Any scientific research or monitoring undertaken at Mistaken Point requires a permit issued by the PNAD. Inappropriate

development is prohibited within the ecological reserve.

Visitation to the nominated property is currently low and has been stable with on average 1,000 visits per annum. Access is controlled through guided tours which promote education. A carefully designed visitor management system is in place ensuring carrying capacities are not exceeded.

Illegal fossil collecting which has historically been a concern is no longer considered a serious threat due to effective enforcement. Supplementary information has indicated that seaward access to the nominated property is limited to a four beach areas as the rest of the coastline is rugged and precludes boat landings. Routine monitoring of access to the beaches and the provision of regulatory signage should be considered to ensure that this point of public access does not become a threat to the fossil bearing areas within the property.

The PNAD has five staff on site at Portugal Cove South with responsibility for management, interpretation and implementing the nominated property management plan. The State Party has advised that staffing will be increased further in 2016 in order to assure the additional responsibilities anticipated should the property become a World Heritage site.

Funding comes from the Provincial Government and totals c.CAD 390,000 p.a. (c. USD 300,000) mainly to support staffing and operating costs for the reserve. Other partner organisations are separately funded and augment the resources available. As with staffing there is a commitment to increase funding should the nominated property be listed, for example the nomination notes funding will increase to c. CAD 500,000 p.a. (c.USD385,000) in 2016/17. The current protection and management structure is considered excellent with strong support from local community groups and through local stewardship initiatives.

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

### 4.4 Community

There is no reported evidence of Aboriginal settlers having occupied the area and the first European settlers date from the mid-19<sup>th</sup> Century making their livelihood from small scale fishing, hunting and meadow grazing. Today, the Southern Avalon Peninsula generally, and the Portugal Cove South area in particular, is sparsely populated, owing in large part to the closure of the commercial cod fishery in 1992.

There is solid community engagement evident in the nominated property with various community initiatives empowering stakeholders in active management and interpretation. Various mechanisms for stakeholder engagement are in place including the Mistaken Point Ambassador Inc (MPAI); Scientific Advisory

Committee; Cape Race – Portugal Cove South Heritage Inc.; Edge of Avalon Interpretive Centre; Reserve Interpreters Team, and a Fossil Guardians Team. The Interpretive Centre, Interpretive Guide Team and the Fossil Guardian Team are all created and run by the local community.

The evaluation mission reported positive support for the nomination and a healthy culture of stewardship by local people for the area. IUCN notes that community action has to a large extent driven the nomination as a means to increase the protection of this nominated property.

#### 4.5 Threats

Mistaken Point's relative isolation and exposed windswept coastal location have protected it from past development and the nominated property is relatively free from threats.

Following the discovery of Mistaken Point's fossils in 1967 a period of fossil collecting occurred over some 20 years. An estimated 200-250 fossils were removed from the nominated property, most ending up in museum collections, however, some illegal collecting also happened. Since the late 1980s protection of the nominated property has effectively stopped this practice and incidents of theft or vandalism are extremely rare. The last known major attempt at illegal fossil removal occurred in September 1998 and was foiled by local residents.

The main potential threat to the property stems from the impact of natural phenomena, particularly surface erosion, wave erosion, and potential rock falls and landslides. Some of the nominated property's fossil-bearing surfaces are partially covered, however in general the fossils are superbly displayed. High energy storm waves, particularly from the west, constitute the biggest potential threat but evidence is that the rate of erosion is very slow, a fact confirmed via supplementary information. In the longer term (decades and centuries) this might pose some threats to the future integrity of the nominated property. The improved management plan should take into consideration on an ongoing basis whether any measures to implement low-impact coastal protection are required and feasible to minimize the threats of slope failures that can damage or destroy specific fossil sites, however such interventions should be very carefully considered before any implementation, and to the extent possible natural processes should be maintained to conserve the fossil exposures over time.

Regarding public use, the remoteness of the area and limited access limit the number of tourists who are mainly geotourists or educational groups. Strong protection measure adopted by the PNAD will ensure very little impact from tourism. Access to the nominated property is strictly controlled and limited to trails connecting to important fossils sites and for placing small signage. The rest of the trails are built outside of the buffer zone within the reserve area. As noted above access to the nominated property by boat

is challenging given the rugged coastline and is not considered to pose any significant current threat.

The State Party has indicated there is no threat from offshore developments as oil, gas and/or mineral deposits are not considered to be of economic interests.

Specific points are noted in the draft decision attached to this report regarding details of management measures to be maintained in the event of the property's inscription on the World Heritage List.

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

#### 5. ADDITIONAL COMMENTS

None.

#### 6. APPLICATION OF CRITERIA

**Mistaken Point** has been nominated under natural criterion (viii).

##### **Criterion (viii): Earth history and geological processes**

Mistaken Point fossils constitute an outstanding record of a critical milestone in the history of life on Earth, "when life got big" after almost three billion years of microbe-dominated evolution. The fossils range in age from 580 to 560 million years, the longest continuous record of Ediacara-type megafossils anywhere, and predate by more than 40 million years the Cambrian explosion, being the oldest fossil evidence of ancestors of most modern animal groups. Mistaken Point contains the world's oldest-known examples of large, architecturally complex organisms, including soft-bodied, ancestral animals. Ecologically, Mistaken Point contains the oldest and most diverse examples of Ediacaran deep-sea communities in the world thus preserving rare insights into the ecology of these ancestral animals and the early colonization of the deep-sea floor. Other attributes contributing to the nominated property's Outstanding Universal Value include the world's first examples of metazoan locomotion, exceptional potential for radiometric dating of the assemblages, and evidence for the role of ancient oxygen levels in the regional and global appearance of complex multicellular life.

IUCN considers that the nominated property meets this criterion.

#### 7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC/16/40.COM/8B and WHC/16/40.COM/INF.8B2;
2. Inscribes Mistaken Point (Canada) on the World Heritage List under natural criterion (viii);
3. Adopts the following Statement of Outstanding Universal Value:

#### **Brief synthesis**

*Mistaken Point is a globally significant Ediacaran fossil site almost entirely located within Mistaken Point Ecological Reserve on the southeastern tip of the island of Newfoundland in eastern Canada. The 146-hectare property consists of a narrow, 17-kilometre-long strip of rugged naturally-eroding coastal cliffs, with an additional 74 hectares adjoining its landward margin designated as a buffer zone. The superbly exposed, 2-kilometre-thick rock sequence of deep marine origin at Mistaken Point dates to the middle Ediacaran Period (580 to 560 million years ago) and contains exquisitely preserved assemblages of the oldest abundant and diverse, large fossils known anywhere.*

*More than 10,000 fossil impressions, ranging from a few centimetres to nearly 2 metres in length, are readily visible for scientific study and supervised viewing along the coastline of Mistaken Point. These fossils illustrate a critical watershed in the early history of life on Earth: the appearance of large, biologically complex organisms, including the first ancestral animals. Most of the fossils are rangeomorphs, an extinct group of fractal organisms positioned near the base of animal evolution. These soft-bodied creatures lived on the deep-sea floor, and were buried and preserved in exceptional detail by influxes of volcanic ash – each layer of ash creating an “Ediacaran Pompeii.” Modern erosion has exhumed more than 100 fossil sea-floor surfaces, ranging from small beds with single fossils to larger surfaces adorned with up to 4,500 megafossils. The animals died where they lived, and their resultant fossil assemblages preserve both the morphology of extinct groups of ancestral animals and the ecological structure of their ancient communities. Radiometric dating of the volcanic ash beds that directly overlie the fossil-bearing surfaces is providing a detailed chronology for 20 million years in the early evolution of complex life.*

#### **Criteria**

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

*Mistaken Point fossils constitute an outstanding record of a critical milestone in the history of life on Earth, “when life got big” after almost three billion years of microbe-dominated evolution. The fossils range in age from 580 to 560 million years, the longest continuous record of Ediacara-type megafossils anywhere, and predate by more than 40 million years the Cambrian explosion, being the oldest fossil evidence of ancestors of most modern animal groups. Mistaken Point contains the world’s oldest-known examples of large, architecturally complex organisms, including soft-bodied, ancestral animals. Ecologically, Mistaken Point contains the oldest and most diverse examples of Ediacaran deep-sea communities in the world thus*

*preserving rare insights into the ecology of these ancestral animals and the early colonization of the deep-sea floor. Other attributes contributing to the property’s Outstanding Universal Value include the world’s first examples of metazoan locomotion, exceptional potential for radiometric dating of the assemblages, and evidence for the role of ancient oxygen levels in the regional and global appearance of complex multicellular life.*

#### **Integrity**

*The clearly defined property boundary encompasses coastal exposures preserving all the features that convey its Outstanding Universal Value. All of the key fossils and strata are within the property. The width of the property and its buffer zone, which in large part corresponds to the Mistaken Point Ecological Reserve, are sufficient to absorb the very gradual, long-term retreat of the coastline due to natural erosion. The natural erosion of the site will refresh the fossil exposures over time.*

*The vast majority of Mistaken Point’s fossils – including several type specimens – remain in situ in the field and are thus available for study in their ecological context. Several hundred fossil specimens were collected prior to Mistaken Point Ecological Reserve being established; most of these are currently housed in the Royal Ontario Museum and form the bulk of the type specimens for taxa named and defined from Mistaken Point. Nonetheless the property is thought to contain more specimens of Ediacara-type impression fossils than the sum total of every museum collection on Earth.*

*Few traces of past human activities remain and none directly affect the property’s key attributes. Visitation to the site is modest and strictly controlled. The prospect of modern development within or adjacent to the property is minimal and does not impinge upon its coastal outcrops. Incidents of vandalism are very rare and no successful fossil thefts have occurred since the property was designated as an ecological reserve in 1987. No inhabitants reside permanently within the property or its buffer zone.*

#### **Protection and Management requirements**

*The property is provincially owned and is managed by the Parks and Natural Areas Division of the Newfoundland and Labrador Department of Environment and Conservation. Virtually all of the property, plus most of its buffer zone, lie within Mistaken Point Ecological Reserve which is protected under the Province’s Wilderness and Ecological Reserves Act (1980) and Fossil Ecological Reserve Regulations (2009). With one exception, the remaining portions of the property and buffer zone are protected as Crown Lands Reserves under the provincial Lands Act (1991). Only one small part (0.5 percent) of the buffer zone has been identified as private land; current and anticipated land use is complementary to the rest of the buffer zone.*

*The property’s key coastal exposures are further protected by the ecological reserve’s Fossil Protection Zone; access to this zone is by permit only.*

*Undertaking activities such as scientific research at Mistaken Point requires a permit issued by the managing agency. Development is prohibited within the ecological reserve.*

*The comprehensive management plan developed for the property and its buffer zone is adaptive and will be revised as required. Input from local residents regarding management issues is channelled through the property's World Heritage Advisory Council. For management purposes, the property is best treated as a finite fossil site. Except for official salvage of scientifically valuable specimens, collecting fossils is illegal. For conservation reasons, public viewing of the fossils is by guided tour only. Daily patrols of the property are conducted year-round and a volunteer Fossil Guardian Program is in operation.*

*The most significant threats to be managed are the ongoing issue of change resulting from natural erosion processes, and impacts of human activity. Under the monitoring plan, vulnerable fossil localities are regularly surveyed and any problems documented. The rate of erosion appears very slow and any loss of fossils to erosion may be offset by new exposures. Monitoring processes should trigger appropriately considered management responses to document fossil evidence, if any significant losses from erosion are identified. The carrying capacity of the property is limited and the cumulative environmental impact of visitation is closely monitored and limited. Limited signs and visitor access to aid presentation of the property are carefully designed and sited to avoid adverse impacts upon the property's Outstanding Universal Value.*

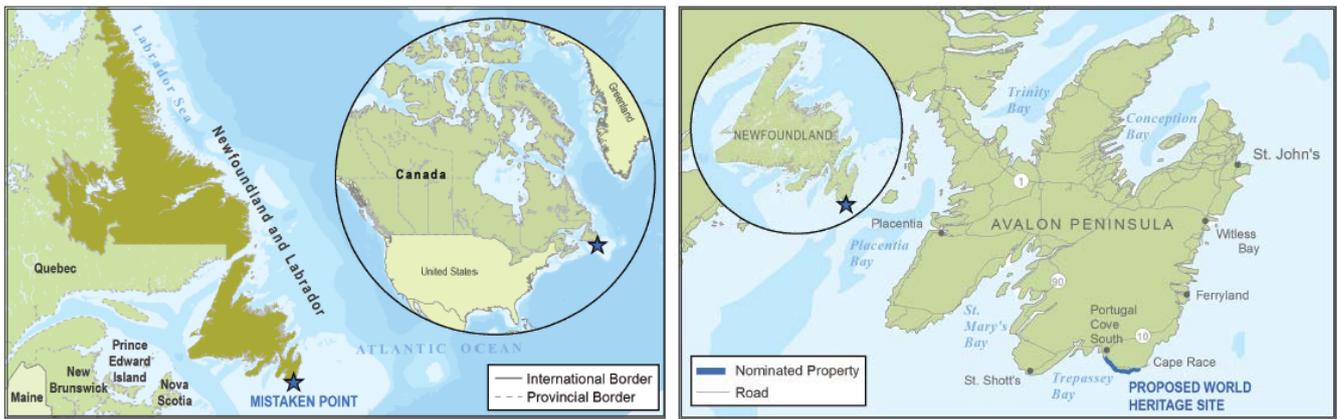
*Through its long-term pledge to provide operational funding and staffing, the Government of Newfoundland and Labrador is committed to ensure that the highest possible standards of protection and presentation are maintained in the property.*

4. Commends the State Party and all of the stakeholders involved for the development of this nomination including the rigorous and objective comparative analysis which is a model of good practice for fossil sites, and the excellent local engagement in the protection, management and presentation of the nominated property;

5. Requests the State Party to:

- a) appropriately mark and communicate the boundaries of the property and its buffer zone, including beach landing sites to reinforce protection through enhanced visitor and local awareness;
- b) monitor and mitigate if appropriate potential threats from coastal erosion, especially on the western part of the property, taking great care to evaluate the feasibility and impacts of any interventions prior to implementation;
- c) consider the possible addition of any significant new Ediacaran fossil site discoveries in the region where these would add further attributes to the Outstanding Universal Value of the property.

**Map 1:** Location of the nominated property in Canada and on the island of Newfoundland's Avalon Peninsula



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



**EUROPE / NORTH AMERICA**

**VIRGIN KOMI FORESTS  
(significant boundary modification)**

**RUSSIAN FEDERATION**



Yugyd Va National Park - © IUCN Nikita Lopoukine



# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## VIRGIN KOMI FORESTS (RUSSIAN FEDERATION) – ID No. 719 Rev

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** Not to approve the significant boundary modification.

**Key paragraphs of Operational Guidelines:**

Paragraph 77: Boundary modification removes significant attributes relevant to the application of natural criteria.

Paragraph 78: Boundary modification does not meet conditions of integrity and protection and management requirements.

**Background note:** The Virgin Komi Forests were inscribed by the World Heritage Committee at its 19<sup>th</sup> Session in Berlin, Germany, 1995. In decision CONF 203 VIII.A.1, *“the Committee decided to inscribe an area of 3.28 million ha, which is fully protected as a National Park, Zapovednik and buffer zone. It requested the Centre to write to the national authorities to encourage them to upgrade the legal status of an additional 700,000 ha so that this adjacent area could be incorporated in the site.”*

The property has subsequently been considered by the Committee, in relation to its State of Conservation on a number of occasions, and was visited by a World Heritage Centre/IUCN Reactive Monitoring Mission in 2010. IUCN recalls previous Committee’s decisions (Decision 36 COM 7B.24, 37 COM 7B.24, 38 COM 7B.78 and 39 COM 7B.23) on the State of Conservation of the property requesting the State Party, *inter alia*, to reverse the boundary changes made to the Yugyd Va National Park component of the property to take into account the respective decision of the Supreme Court of the Russian Federation and its Board of Appeal and halt gold mining activities at Chudnoe.

The State Party of the Russian Federation submitted a request for a significant boundary modification in January 2015 proposing the excision of two areas and the addition of areas in the southern part of the property. The Committee’s attention is drawn to the original evaluation (<http://whc.unesco.org/en/list/719/documents/>) in order to avoid repeating information, together with the State of Conservation Reports, and 2010 mission report, available from the same weblink.

### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 16 March 2015

**b) Additional information officially requested from and provided by the State Party:** Following the IUCN World Heritage Panel a progress report was sent to the State Party on 16 December 2015. This indicated that the IUCN World Heritage Panel considered that there was a number of significant issues that led to concern about the nomination, notably in relation to the inappropriate removal of attributes that support the Outstanding Universal Value of the property, and the lack of conformity with the position of the Supreme Court of the Russian Federation regarding the maintenance of the boundaries of the property, and with past decisions of the World Heritage Committee on the State of Conservation of this property.

**c) Additional literature consulted:** Documentation regarding the original inscription and the State of Conservation of the property, as available on the UNESCO World Heritage Centre website.

**d) Consultations:** 4 Desk reviews received. The mission also met with the Minister of Natural Recourses and Environmental Protection of Komi Republic; the Deputy Chef of Department of Subsoil for the North-West Region; the Director of Center for

Protected Areas; the Acting Director of National Park Yugid-va; the Head of Division in Republic of Komi of Federal Service for Supervision of Natural Recourses; the Co-developer of the Nomination dossier, the Program coordinator Birds and Humanity; the Director General Gold Minerals; the Director General Kozhimboskoe RDP; the current Head of Environmental Education Centre; representatives from the Institute of Biology, Komi Scientific Center, Russian Academy of Science; NGO Save the Pechora Committee; Greenpeace Russia.

**e) Field visit:** Nikita Lopoukhine, 16<sup>th</sup> - 20<sup>th</sup> October 2015

**f) Date of IUCN approval of this report:** April 2016

### 2. SUMMARY OF THE BOUNDARY MODIFICATION

The property was inscribed under criteria (vii) and (ix) (Decision 19COM VIII A.1) in 1995, and the revised boundary is proposed in relation to the same criteria. The proposed significant modification to the boundaries comprises an excision of some of the northern areas of the property, and additions of other areas, primarily to the west of the central part of the property. IUCN has not been able to reconcile all of the figures provided in the nomination. According to the nomination, the nominated property covers

3,473,085ha comprised in four different protected areas; thus the proposed areas for addition (183,222ha) represents 5.3% of the area of the property and could be considered via the Minor Boundary Modification process. However, as the excisions are concerned with mining areas, the State Party has, as recommended previously by the World Heritage Committee, submitted it through the process for a Significant Boundary Modification.

The documentation provided follows the format of a completely new nomination, but does not clearly address the main questions to be considered for a significant boundary modification. The documentation neither articulates the new values the additions bring to the property, nor does it describe the potential impacts related to the excisions. The proposed excisions primarily relate to two areas, both of which have been considered in previous decisions of the World Heritage Committee:

- 1) Tracts in the northern part of Yugyd Va National Park (YVNP) that encompass operating quartz mines (Zhellanoye and near Kozhym). A detailed map of this area is included in the nomination.
- 2) Areas of the suggested gold mining operation (Chudnoe) that are located at the northeastern part of YVNP. No inset map is included in the nomination.

The total area of excision is not provided in the nomination, but can be estimated to be in the order of 50,000 ha. As noted in the IUCN evaluation report of 1995, the areas proposed for excision were explicitly recommended for inclusion within the property at the time of inscription. IUCN at that time also raised some serious concerns that the mining activities would “seriously impair the values of the site” and recommended to abandon these activities. The area is noted as significant for nature conservation within the property; for instance reviews note that the Institute of Biology of Komi Republic has identified 70 species of vascular plants, bryophyta, lichen and fungi inscribed in the Red Data Book of Komi Republic in this area. The area is in a different river catchment and adds distinctly different biodiversity values to the areas proposed for addition.

The nomination also appears to propose minor changes to boundaries near Vuktyl (Incut 2, Annex A 1.1.2 in the nomination). These changes appear to show an excision of some lands adjoining Pechora River, and leaving some small fragments of the property isolated on the west side of the river. However the inset maps do not correspond to the current World Heritage Site boundaries officially submitted by the State Party to the World Heritage Centre; thus it requires further clarification.

The proposed additions comprise forest areas of 183,222 ha. These include areas discussed during the 2010 Reactive Monitoring Mission and recommended for consideration to add to the protected areas (and potentially either to the buffer zone or to the property). These areas comprise areas of spruce forests between the National Park and Nature Reserve that make up the property in the basin of the Ilych river and

are clearly only a small part of the estimated 700,000ha that was recommended for consideration by the Committee at the time on inscription. Despite being a relatively small part of the recommended additions, the area includes pristine forests, alpine meadows and mountain tundra and would result in a more holistic coverage of the western slopes of the Ural and increase the coherence of the western boundary of the nominated property.

The original inscription was of a serial property, with one area of the Pechoro-Ilychsky Zapovednik as a relatively small detached component to the south-west of the property, and this configuration is not changed in the new nomination (the additions proposed are contiguous with the existing property).

### 3. COMPARISONS WITH OTHER AREAS

The re-nomination retains the criteria of the original inscription, and the additions and excisions do not fundamentally require a review of the global comparative analysis. A comparative analysis was reported in the 1995 IUCN evaluation report. The nomination document nevertheless provides a short table comparing the property with three other World Heritage properties (Putorana Plateau and Volcanoes of Kamchatka, Russian Federation, and Waterton Glacier International Peace Park, USA/Canada) in relation to overall biodiversity. The nomination document does not provide any analysis of the values of the proposed additions and does not deliver a comparison with similar areas in the region in relation to the additional areas.

### 4. INTEGRITY, PROTECTION AND MANAGEMENT

#### 4.1 Protection

The proposed additions are located in the Conservation Area of the Yugyd Va National Nature Park and the Pechoro Ilychsky (Nature) Reserve (Zapodvenik). The nomination document does not specifically refer to the protection status of the new areas, and it was noted by the evaluation mission that the proposed additions have not yet been gazetted, and that it is proposed this would be done after the World Heritage Committee decision.

With regard to the excisions, these would exclude from the World Heritage property areas that are protected within the boundaries of YVNP, including the Chudnoe gold mining area which has been the subject of intense past consideration by the World Heritage Committee. The proposal to exclude that area from YVNP has also been the subject of intense national interest and has been declared illegal by the decision of the Supreme Court of the Russian Federation, and confirmed on appeal. In this context it is particularly important to note that the proposal for this boundary modification does not take into account this legal decision regarding the boundaries of YVNP. In principle the excisions are not acceptable, given the clear legal confirmation of those legally protected areas as part of YVNP. The

attention of the Committee is drawn to the discussion of these matters in State of Conservation Reports, and its past requests to the Russian Federation to not excise mining areas from the nominated property.

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

#### 4.2 Boundaries

The proposed excisions will have significant impacts on the integrity of the property as well as on its Outstanding Universal Value. There is high potential for downstream impacts by the continued mining activities and the proposed gold mining, as considered at the time of the inscription of the property, and by both the previous monitoring mission and the current evaluation. In the case of Chudnoe, in addition to the direct loss of values and the impact of mining, there would also be implications for road construction and traffic of heavy vehicles that require access through the property.

The proposed extensions potentially improve the integrity of the property. The proposed forest extension will contribute to connectivity but only add lower elevation forests found already elsewhere in the property. However the nomination does not make clear how the forest areas proposed for additions were chosen, as there are many other forest areas around the property that could merit consideration. Some of the forest blocks proposed for additions have been exploited in the past and therefore seem of limited value.

The State Party does not propose any buffer zone to the property (as requested by the Committee and following the Reactive Monitoring Mission in 2010). It is argued that the buffer zones of the two protected areas forming the inscribed property are included in the property and that the eastern side does not need a buffer zone. However IUCN notes that in principle a buffer zone for a World Heritage property should be located outside the boundaries of a property, thus this issue remains to be considered. IUCN notes that a buffer zone can be created via the Minor Boundary Modification process of the Convention's Operational Guidelines.

In conclusion and on balance, the proposed boundary modification as a whole will adversely impact on the integrity of the property, in particular the proposed excisions in the northern parts of the property.

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

#### 4.3 Management

The property is managed by various agencies and protected area administrations. A Management Plan for the YVNP was approved in 2008, and the one for the Pechoro Ilychsky Zapovednik in 2005. The State Party has submitted individual business plans for

YVNP and the Zapovednik resulting from an UNDP-GEF financed project but dating back to 2011 and 2010 respectively. No information is included on the execution of these plans. According to the nomination document the National Park financing from the federal government over 2013-15 amounted to c.USD \$3 million, which is an adequate level of finance. In spite of recommendations from the Committee (Decision 37COM 7B.25) and the 2010 Reactive Monitoring Mission an integrated management plan for the property was not submitted with the nomination dossier. IUCN notes that additional documentation described as a management plan was received by the World Heritage Centre in February 2016, although not clearly indicated as supplementary information for the nomination. This is a four-page cover document describing the property and stating that it has two components protected areas, and that each of them has a management plan, and then attaching the individual Business plans for YVNP and Pechoro-Ilychsky Zapovednik. IUCN considers that this cannot be considered as an adequate integrated management plan for the property as a whole. The submitted plan is also considered within the State of Conservation report on the property.

As noted above, the excisions to the property would impact the management of the property by reducing the effectiveness of the conservation of YVNP and creating the risk of additional impacts on YVNP from industrial activities. This is particularly the case in relation to the proposals for new mining at Chudnoe. In the case of the other areas, IUCN recalls the position of the joint World Heritage Centre/IUCN 2010 Reactive Monitoring Mission, that the State Party should develop a strategy to phase out the Zhelannoe and Obeiz quarries, which pre-date the inscription of the property.

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

#### 4.4 Community

The mission had limited opportunities to engage with community representatives, but noted the economically depressed situation of the town of Inta, previously a coal-mining town. A local NGO was met; it is opposed to the proposed excision of land. It appears that more could be done to engage local communities in the management of the property. No sustainable tourism strategy for the overall property exists, and this could be an appropriate focus for further work at the community level to consider how the property can contribute further to local wellbeing, whilst ensuring its effective protection.

#### 4.5 Threats

As noted above the principal threat to the property linked the boundary modification is related to mining-related impacts, both direct and indirect. The proposed additions do not appear to add significant additional concerns to the property regarding threats. Additional discussion of threats to the existing property are

considered in the State of Conservation reports and are not considered here, since they do not relate to the proposed boundary modification.

IUCN considers that the proposed boundary modification does not meet the integrity and the protection and management requirements outlined in the Operational Guidelines.

## 5. ADDITIONAL COMMENTS

### 5.1 Serial property

The property is inscribed as a serial property, with a detached component to the South-West, which the IUCN evaluation mission clarified is an area that includes a moose rearing facility. Since no change is proposed to this configuration IUCN has not evaluated the consideration of the serial property. The proposals for minor changes to the boundaries (Incut 2, Annex A 1.1.2 in the nomination) appear to have a serial configuration, but IUCN considers need clarification, since the map provided does not appear to correspond to the existing boundaries of the property.

## 6. APPLICATION OF CRITERIA

**Virgin Komi Forests** (Russian Federation) is proposed to be modified through a Significant Boundary Modification, and is inscribed under criteria (vii) and (ix).

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

The proposed excisions would impact negatively on the aesthetic quality of the property by creating significant disturbance to the northern part the area that would greatly detract from its wilderness values. The changes proposed are also contrary to the legal protection of the property, as confirmed by the decision of the Supreme Court of the Russian Federation regarding the integrity of the existing boundaries of Yugyd Va National Park, and are thus unacceptable. The proposals are also not consistent with the World Heritage Committee's clear position on the matter, since the time of the original inscription on the World Heritage List.

The proposed additions to the property would add to the integrity related to this criterion, but at the present time do not appear to fully meet the protection and management requirements. These additions should be formally gazetted as an addition to the Yugyd Va National Park, and be included in its management plan. In addition it should be evaluated whether all of these areas should be included in the property, or in a buffer zone to it. When the appropriate protection is in place, these additional areas would appear to be potentially suitable to be proposed for inclusion in the property via the Minor Boundary Modification process, which would also ensure that the added value that they bring to the property is adequately justified. The State Party is invited, if it wishes to do so, to seek further

advice from the World Heritage Centre and IUCN in this regard.

IUCN considers that the boundary modification proposed does not meet this criterion.

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

The areas proposed for excision include notable nature conservation values relevant to criterion (ix) and are the recorded location of biodiversity values of conservation significance within the property. In addition to direct impacts, the proposed excisions would also create indirect impacts on the property through facilitating mining that would entail pollution risk and greatly increased road traffic within the property. The mining activities proposed have been consistently noted since the time of inscription on the World Heritage List as presenting a threat that would seriously impair the values of the property. The same considerations regarding the legal protection of the property also apply, as noted above.

The additions to the property would, in principle, increase the ecological connectivity of the property along its western boundary, and including additional areas of primary forest and other ecosystem related values. As noted above, there is a need for clear justification of the values which would be added by these areas, a further reflection on the detailed nature of the boundaries (including the possible relationship to a buffer zone), and to establish effective protection and management.

IUCN considers that the boundary modification proposed does not meet this criterion.

## 7. RECOMMENDATIONS

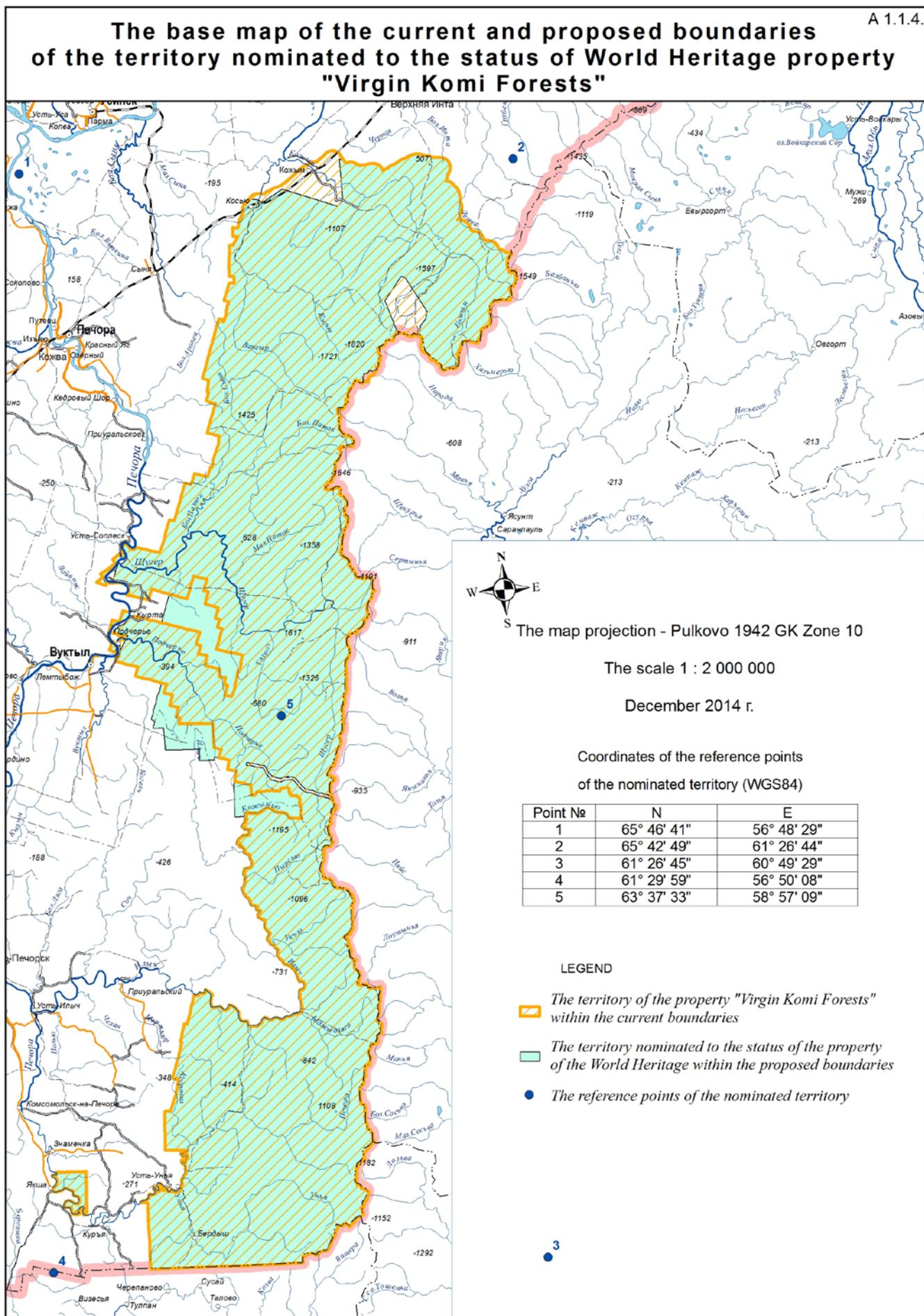
IUCN recommends that the World Heritage Committee adopt the following draft decision:

The World Heritage Committee,

1. Having examined Documents WHC/16/40.COM/8B and WHC/16/40.COM/INF.8B2;
2. Recalling Decisions 36 COM 7B.24, 37 COM 7B.24, 38 COM 7B.78 and 39 COM 7B.23;
3. Does not approve the significant boundary modification of **Virgin Komi Forests (Russian Federation)**;
4. Requests the State Party to implement fully the existing requests of the Committee in relation to the State of Conservation of the currently inscribed property, and its surrounding landscape;
5. Invites the State Party, with the support of the World Heritage Centre and IUCN if requested, to submit for inclusion in the property via a Minor Boundary Modification *only* the additional areas to the west of the property, when protection and management measures

are fully in place. It further recommends to the State Party the creation of a buffer zone to the property, in line with the Committee's previous recommendations on this matter.

Map 1: World Heritage Site and proposed Significant Boundary Modification



**EUROPE / NORTH AMERICA**

**WESTERN CAUCASUS  
(significant boundary modification)**

**RUSSIAN FEDERATION**



Lagonaki Plateau - © IUCN Chimed-Ochir Bazarsad



# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## WESTERN CAUCASUS (RUSSIAN FEDERATION) – ID No. 900 Rev

**IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE:** Not to approve the significant boundary modification.

**Key paragraphs of Operational Guidelines:**

Paragraph 77: Boundary modification removes significant attributes relevant to the application of natural criteria.

Paragraph 78: Boundary modification does not meet condition of integrity and protection and management requirements.

**Background note:** Western Caucasus was inscribed on the World Heritage List at the 23<sup>rd</sup> Session of the World Heritage Committee, in 1999. At the time of inscription the Committee decided specifically to include the Lagonaki Plateau within the property, following the agreement of the Russian Federation to include this area. The Committee also did not include in the property areas that were nominated in the Sochi National Park, although the reasons for that are not documented. The decision of the Committee records that IUCN's original recommendation had been to defer the property, and the Bureau (which at that time presented a recommendation on nominations to the Committee) had adapted this to referral. The World Heritage Committee then inscribed parts of the nominated area on the World Heritage List.

In the official decision it is recorded that: *“The Committee decided to inscribe the site on the World Heritage List under criteria (ii) and (iv). The site includes: The territory of the Caucasus State Biosphere Reserve (CSBR) with the exception of the Khosta Yew-Box Grove but including the entire Lagonaki plateau. IUCN noted that previous concerns relating to the integrated management of this area and the status of the Lagonaki-Dagomys road had been adequately addressed by the State Party. IUCN recommended that the State Party elaborate a master management plan for all the protected areas included in the nomination.*

*The Observer of the Russian Federation, in thanking the Committee, stated that nature conservation is being taken into account in the protection of this property and all future measures for its extension. He noted the interest of the State Committee for the Environment in the enlargement of the territory of the nomination by means of incorporation of the strict conservation zone of the Sochi National Park in the near future”.*

The property has been subject to four monitoring missions between 2008 and 2012. IUCN recalls previous Committee's decisions (Decision 36 COM 7B.23, 37 COM 7B.23, and 38 COM 7B.77) on the State of Conservation of the property requesting the State Party not to allow capital construction on Lagonaki plateau (ski tourism) as well as on Mt Oshten/Mt Fisht; to create a functional buffer zone; not to weaken the legal protection status; and to implement an overall management plan and coordinating body for the property. In 2013, the State Party had already proposed to submit a proposal for a boundary modification in order to exclude parts of the Lagonaki plateau from the property. The Committee subsequently took note of this intention and in its decisions has recalled that such a proposal had to be clearly justified in terms of the Outstanding Universal Value (OUV) for which the property was inscribed, should be based on reliable scientific data and should be submitted as a significant boundary modification, in accordance with Paragraph 165 of the Operational Guidelines.

The Committee's attention is drawn to the original IUCN evaluation ([http://whc.unesco.org/archive/advisory\\_body\\_evaluation/900.pdf](http://whc.unesco.org/archive/advisory_body_evaluation/900.pdf)) in order to avoid repeating information.

### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 16 March 2015

**b) Additional information officially requested from and provided by the State Party:** Following the IUCN World Heritage Panel a progress report was sent to the State Party on 16 December 2015. This indicated that the IUCN World Heritage Panel did not have further questions but that IUCN would nevertheless welcome the opportunity to discuss the evaluation of the proposed modification with the State Party, and notably a number of proposals that appear to be both

inappropriate regarding the impact on the Outstanding Universal Value of the property, and not in conformity with past requests of the World Heritage Committee. These include the removal of areas that clearly carry attributes that are part of the justification for inscribing the property on the World Heritage List, and significant changes that would result in a loss of integrity of the property by creating *de facto* a serial World Heritage listing, without connectivity between its components.

**c) Additional literature consulted:** Documentation regarding the original inscription and the State of Conservation of the property, as available on the

UNESCO World Heritage Centre website, as well as other sources.

**d) Consultations:** 9 Desk reviews received. The mission also met with the Minister of the Krasnodar Region; the Deputy Head of Federal Supervisory Natural Resources and Management Service; the Deputy Director, Department of International Cooperation, Ministry of Natural Resources and Environment of the Russian Federation; the Head of Division, Department of International Cooperation, Ministry of Natural Resources and Environment of the Russian Federation; the Head of Division, Department of Environment and Land Relations, Northern Caucasus Resorts; the Head of Committee for tourism and resorts of Adigea; the Head of Department of environment protection and natural resources of Adigea; the Director, Center of mountain tourism development; representatives of WWF Russia, Greenpeace Russia, Environmental Watch on North Caucasus, NABU-Caucasus, Caucasus State Nature Reserve.

**e) Field visit:** Carlo Ossola and Chimed-Ochir Bazarsad, 22 – 25 October 2015

**f) Date of IUCN approval of this report:** April 2016

## 2. SUMMARY OF THE BOUNDARY MODIFICATION

The Western Caucasus was inscribed under natural criteria (ix) and (x) at the 23<sup>rd</sup> Session of the Committee in 1999 (Decision 23COM VIII A.1). The original IUCN evaluation and the original nomination record the values of the property as currently inscribed, and a retrospective Statement of Outstanding Universal Value is under preparation by the State Party, and will be presented to the World Heritage Committee. It is to be noted that it was an explicit decision of the World Heritage Committee to include the Lagonaki Plateau in the World Heritage property, considering the significance of its values. The Committee also did not include the strict conservation zone of Sochi National Park in the inscribed property at that time, although the IUCN evaluation does not provide a basis to exclude those areas. The Russian Federation clearly indicated to the World Heritage Committee, at the time of inscription, their interest to include additional areas in Sochi National Park in the nominated property (see background note above).

The State Party of the Russian Federation submitted a request for a significant boundary modification in January 2015 proposing the excision of two areas and the addition of a number of areas to the property. The proposed excision is of 6,550 ha, a large part of the area of the Lagonaki Plateau. The proposed addition is of four separated plots of Sochi National Park (SNP) located at the southern and south-western border of the inscribed property (62,152 ha); of the Sochi State Wildlife Sanctuary (SSWS) (6,202 ha); and of the Buxus Colchica Plantings Natural Monument in the north of the property (1,474 ha). In addition, the nomination dossier also mentions a proposed boundary revision in the area of the Caucasus State

Natural Biosphere Reserve and Natural Monument Buinyi Ridge to exclude the area of “Lunnaya Polyana”. In summary the results is an addition of 64,278 ha, which would correspond to an increase in the property of c. 21.5%. The revised maps for the property are not fully clear, but also present some minor boundary corrections in the northern part of the property (without indications of the size nor of the rationale for the proposed changes).

A significant impact of the proposed boundary modification would be to divide the property in three separated component parts: a large central element (central part of the Caucasus Strict Reserve, with some parts of the SNP and the SSWS), a small element on the eastern part of the Lagonaki Plateau (Kamennoye More Range) and a third element on the south-western part (the Ashe Upper River area of the SNP). Thus the property would change from being a single area, to a *de facto* serial property.

The impacts of the changes are discussed further below. The documentation provides selected information on Sochi National Park and its biodiversity in general but does not indicate clearly the additional value of the proposed additions. The rationale for the excision of the Lagonaki Plateau is also not clearly set out in the nomination, but would result in diminishing the Outstanding Universal Value of the property, by taking out an area which is deemed of the highest biodiversity in the whole property, and was explicitly included at the time of inscription in view of its significant contribution to OUV.

## 3. COMPARISONS WITH OTHER AREAS

The re-nomination retains the criteria for inscription of the original inscription and a comparative evaluation can be found in the 1999 IUCN evaluation document.

The nomination document does not provide an analysis which clearly describes the values of all proposed additions and does not deliver a comparison with similar areas in the region which would enable assessment of the importance of the additions for the biodiversity of the Caucasian Range and for the conservation of the pristine ecosystem in comparison with other parts of the Caucasus Range. The nomination document only provides a short table comparing the proposed addition of Sochi National Park in terms of vascular plant number with a number of selected other (Russian) protected areas including at least one other area in the Caucasian region. No comparison is provided for the other additions.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1 Protection

The areas proposed for extension of the property have differing types of conservation status. Whilst large parts (62,152 ha) are located in the Sochi National Parks (SNP) natural conservation zone (equivalent to IUCN Protected Area Category Ia), other parts

(6202 ha) are located in the Sochi State Wildlife Sanctuary (equivalent to IUCN Protected Area Category IV). In the State of Conservation reports on the property, it has been noted that recent legislative changes raise serious concerns about the adequacy of the protection status of SNP and SSWS, particularly the amendments adopted by the Ministry of Natural Resources and Ecology in 2015 to the Decrees of the two protected areas. These amendments changed the zoning regime of the two protected areas, expanding the recreational zones, where tourism infrastructure could be allowed, at the expense of the specially protected zones. The most recent information on these matters is presented in more depth in item 7B of the Committee's agenda.

Another proposed extension is the Massif of Buxuc Colchica Natural Monument adjoining the current boundary of the property on the north-west, that has the status of Natural Monument of regional importance (1,474 ha; IUCN category not assessed). Given the previous State of Conservation requests of the Committee expressing the need to revise the "certificates" of the Nature Monuments included in the property to ensure all logging, including sanitary cutting, construction of roads, overpasses, power lines and other communication infrastructure are not allowed and the construction of capital construction projects for recreational use is prohibited, it has to be concluded that the legal protection status is not fully adequate. Thus for the proposed additions, these matters would need to be addressed prior to a recommendation for approval.

Information on the protection status of the smaller additions is not provided in the nomination dossier. It is assumed that they are included in the other legally protected areas already composing the inscribed property including Natural Monuments of regional importance with the need for revision of their "certificates" (see above).

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

## 4.2 Boundaries

IUCN has considered both the excision and the additions to the nominated property, which are discussed below.

The proposed excision of the Lagonaki Plateau, although a relatively small percentage of the overall property, would clearly negatively affect the integrity of the nominated property as it removes an area which has been consistently considered as an essential element to express OUV under the criteria for which it was inscribed, for its rich biological diversity, particularly its high carabid species diversity, and the fact that it covers two-thirds of the site's vascular plant species including many endemics (IUCN evaluation 1999). IUCN notes that the World Heritage Committee explicitly decided to include this area in the property due to the significance of its values.

Reviewers consistently note the values of the Lagonaki Plateau as significant. It is noted as extraordinarily rich in landscape and biological diversity, and as the most botanically valuable part of Western Caucasus due to the plateau's natural isolation, geological age and unique limestone substrate, as well as widespread karst formation and location on the border of two great Caucasus regions; on the junction of Colchis and Caucasus botanical provinces; and on the junction of two climate zones - temperate and subtropical Mediterranean.

Specific values include more than 800 vascular plant species (84% of mountain flora of the entire Caucasus Reserve), 60 liverwort species (31% of all liverwort species known in the Caucasus), 200 leafy moss species (53% of moss flora of the entire Caucasus Reserve), approximately 580 species of lichens (30 species are new to Russia and are not known outside of Lagonaki Plateau), and 67 mushroom species. The plateau is a natural habitat for rare and endemic species of amphibians: Southern Crested Newt (*Triturus karelinii* - LC), Southern Banded Newt (*Triturus vittatus* - LC), Smooth Newt (*Triturus vulgaris* - LC), Caucasian Toad (*Bufo verrucosissimus* - NT), Caucasian Parsley Frog (*Pelodytes caucasicus* - NT) and reptiles (*Darevskia alpine* - VU, *Darevskia derjugini* - NT, *Vipera dinniki* - VU). More than 20% of nesting birds of the Lagonaki plateau are considered as endangered, including Cinereous Vulture, Griffon Vulture, Bearded Vulture, Peregrine Falcon, Caucasian Snowcock, Caucasian Grouse, Horned Lark, Wallcreeper and others. It is possible that the plateau is the location of the only nesting place of Eurasian Dotterel (LC) in the entire Western Caucasus. The Lagonaki Plateau is characterized by the highest diversity of terrestrial molluscs on the Caucasus. The greater part of them is the regional and local endemic species. The insect fauna is of great interest and endemism of some groups of insects is higher than 60%. For example, there are 68 species of ground beetles, out of which 11 (16%) are narrowly endemic to Western Caucasus. The same can be said of half of the 10 species of bumblebees.

The excision may also allow for an even more intensive development of the excised area for tourism, and would potentially result in it suffering from the enhanced adverse effects of these developments in the immediate surrounding of the inscribed property.

The nomination document argues that previous degradation of the habitats of the Lagonaki plateau through grazing (dating long back before the first inscription of the property) has resulted in a loss of values. However, the 2016 SOC report notes a positive dynamic for the Lagonaki plateau where restoration of the natural plant communities has been ongoing in the areas that had been previously damaged by excessive grazing in 1980-1990s. This trend is encouraging and it will enhance integrity rather than reduce it and therefore speaks against excising the area from the property. Thus whilst conservation issues do face Lagonaki, they provide no reason to exclude it from the nominated property.

IUCN thus considers there is ample and clear documentation that justifies maintaining the Lagonaki Plateau as a crucial element of the property. The values are entirely different to those of the proposed additions, and thus their removal would be a severe negative impact on its Outstanding Universal Value and its associated conditions of integrity. As noted below (section 5) there are additional integrity concerns regarding the impacts of the excision in proposing a serial configuration to the property. Moreover the nomination dossier does not present any rationale to justify the exclusion of the Lunnaya Polyana area in the central part of the property.

The proposed excision of Lunnaya Polyana is not justified in the proposal, and is of concern as it would be an excision in the middle of the property. On the assumption that the excision relates to plans for development in this location, then it can be assumed that apart from any direct impacts, there would also be associated increased road access which could only be achieved within the property, and would create additional impacts.

In contrast to the negative impacts of the excisions, the proposal to include the strict conservation zone of Sochi National Park is consistent with the interest expressed by the State Party and noted by the Committee at the time of inscription of the property on the World Heritage List, and in principle could be welcomed. However, the nomination dossier fails to clearly identify the values of the proposed additions in terms of their contribution to OUV. Reviewers note the significance of these areas, in relation to the protection of migration routes of the Brown Bear (LC), Red Deer (LC), Wild Boar (LC) and Ibex (LC), and as principal autumn-spring feeding areas. Thus these areas in Sochi National Park along the southern border of Caucasian reserve are important to the integrity of the existing property. Endemic amphibians, reptiles and plants are also an important feature in the upper areas of the River Mzymta.

In the view of IUCN the extensions on the southern part of the property appear to add important habitats and species distribution areas on lower altitudes, thus enhancing the biodiversity of the property; however this requires more detailed information to fully understand the values as a whole. The justification for these additions in the nomination is based mostly on the plant species but does not reflect interrelations between faunal and plant components of the ecosystem, especially seasonal animal migrations, even though these are known as significant. In this respect, low-mountain habitats are very important to maintain the population of mammals within the property.

The addition of an area separated from the rest of the property by a valley (i.e. the protection areas of SNP at the Ashe Upper River) adds new habitats for the species related to the southern macroslope of the Caucasus and would include further important areas for the seasonal migration of ungulates and large carnivores, such as Bear. However, this addition would

create concerns on ecological connectivity with the rest of the site. For an extension in the south-western part, it would be important to create a buffer zone to cover the gap between the main component of the SNP and the Ashe Upper River component part to ensure the ecological connectivity.

Due to the recent infrastructure development in the south of the property, the eastern part of the Sochi National Park and the Sochi State Wildlife Sanctuary are important for the protection of the whole ecosystem of the Western Caucasus. A future revised nomination should therefore also consider the potential integration of these important areas of the south-eastern part of the SNP and of the SSWS into the property. For the proposed addition of the Buxus Colchica Plantings Natural Monument, no additional values are documented; it has to be noted that extensive stands of *Buxus colchica* (NT) are also included in SNP. The boundary revisions in the northern part of the property follow a Committee request to finalise the delineation of the northern boundary and can be considered adequate.

The State Party does not propose any buffer zone to the property (as has been repeatedly requested by the Committee and the Reactive Monitoring Mission in 2012). Given the extensive tourism development (especially in the south of the property, and the area of the upper Mzymta Valley) this request remains valid and would become even more important if the protected areas of SNP and SSWS were included in the property.

In summary, taken as a whole, the proposals would result in a clear negative impact on the Outstanding Universal Value of the property, through the excision of the Lagonaki Plateau. The additions, if proposed and better justified, would however appear to increase the integrity of the property, but both need further justification and cannot be accepted in conjunction with the removal of the Lagonaki Plateau.

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

#### 4.3 Management

The property is managed by various agencies and protected area administrations with diverging numbers of staff. The management capacity is highest within the newly proposed SNP, but remains inadequate in the Caucasus State Natural Biosphere reserve (which also covers the newly nominated Sochi State Wildlife Sanctuary) and the regional Protected Areas. The coordination between the staff and agencies involved in management activities does not seem sufficient. In spite of recommendations from the Committee (Decision 37 COM 7B.23) and the 2012 Reactive Monitoring Mission, no information has been provided on the implementation of the 2010-2014 integrated management plan for the property. Given that the plan ended in 2014 and a revised plan has not been submitted, a lack of management plan for the property

is apparent. In addition, as noted below, the serial configuration of the property is not matched with appropriate management arrangements.

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

#### 4.4 Community

The areas of the nominated property are public land either under federal ownership or under ownership of federal entities of the Russian Federation (Krasnodar Krai and the Republic of Adygeya). There are no people living in the nominated property. The evaluation mission met with several NGO representatives; however consultation seems to be limited and there is no mechanism in place to involve local communities and NGOs into decision-making or management.

#### 4.5 Threats

The threats to the property are documented in a long history of State of Conservation reports, which are available to the World Heritage Committee on the documents page of the property, on the website of the World Heritage Centre (<http://whc.unesco.org/en/list/900/documents/>). In summary threats to the property, as well as to the newly proposed areas, include extensive tourism infrastructure development, road construction (Lunnaya Polyana road) and illegal logging. Intensive tourism development (especially at the south-eastern boundary of the property and at Lagonaki) and increasing visitor number to the property itself present the most imminent threat as the south-eastern neighbouring areas are critical wintering areas for ungulates and large-carnivores, which are important to be maintained. IUCN considers that it is of the utmost importance that the State Party acts to protect and conserve the existing property, including Lagonaki Plateau, and the whole of Sochi National Park (including the important natural complexes located in the Upper Mzymta Valley).

IUCN considers that the proposed boundary modification does not meet the integrity and the protection and management requirements outlined in the Operational Guidelines.

### 5. ADDITIONAL COMMENTS

#### 5.1 Justification for Serial Approach

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

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

The nomination does not provide any justification for the serial approach. In this case a serial approach is clearly not justified, since the property is already a contiguous area, and the loss of connectivity represents a clear negative step in terms of integrity.

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

The nomination dossier does not provide any information on functional linkages nor does it provide any proof that despite the separate components ecological connectivity can still be guaranteed. The areas are clearly both functionally linked, and currently part of a contiguous property. The excised area both reduces functional linkage, and will be likely to further impact it, as the excised area would be more likely to be subject to additional tourism development.

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

No management framework is provided.

### 6. APPLICATION OF CRITERIA

**Western Caucasus (Russian Federation)** is proposed to be modified through a Significant Boundary Modification, and is inscribed under criteria (ix) and (x).

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

The proposal comprises an excision of the Lagonaki plateau that will significantly impact the ecosystems included in the property and substantially remove one of the most significant areas in the property, the values of which are also distinct from those of the rest of the property. The excision will also reduce ecosystem connectivity, create fragmentation of natural systems, and is likely to increase existing pressures and threats thus further reducing the already ineffective protection and management of the property. Furthermore the changes would introduce an inappropriate serial configuration to the property by creating new and isolated component parts, by excising an area in the middle of the property. These changes are clearly inappropriate, and run contrary to the provisions of the Operational Guidelines for the application of this criterion, and the related conditions of integrity and protection and management requirements. The changes are also directly contrary to the Committee's explicit decision at the time of inscription regarding the inclusion of the Lagonaki Plateau. IUCN considers that this excision cannot be recommended for approval.

The proposed additions to the property cover a different set of ecosystem values to the proposed excision. These additions would provide additional integrity to the property, notably in protecting it from intensive land-use and providing greater connectivity. There is however a lack of detailed justification of the values of some of these areas, and there are also areas where protection and management should be strengthened. IUCN considers that in view of both the combination of the proposal with a clearly inappropriate excision of the Lagonaki Plateau, the lack of information on the values of the proposed

additions, and the clear need to further improve protection and management, the boundary modification as a whole cannot be recommended for approval.

IUCN considers the proposed boundary modification does not meet this criterion. IUCN further considers that a revised proposal, supported by a clear rationale based on scientific information to include only the additional areas, has the potential to meet this criterion.

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

The excision of the Lagonaki Plateau would result in the loss of some of the most significant species conservation values within the property, that were regarded as an explicit requirement for the inclusion of the property on the World Heritage List at the time of inscription, and thus represents a crucial negative impact on the Outstanding Universal Value of the property. As noted under criterion (ix) the excision will also reduce effectiveness of protection and management, and for similar reasons as those noted above is entirely inappropriate under this criterion. IUCN considers that the proposed excision cannot be recommended for approval.

The proposed additions to the property do not provide the same nature conservation values as the Lagonaki Plateau, but they would provide benefits in terms of additional integrity to the property, and the additional protection and connectivity would benefit key species, such as Brown Bear by protecting feeding and migration areas. These factors mean that these areas require strengthened protection in order to protect the OUV of the property. These proposed additions reinforce the importance of these areas being considered by the World Heritage Committee in relation to the Conservation of the Western Caucasus. As with the case for criterion (ix), IUCN considers that the overall boundary modification cannot be recommended for approval.

IUCN considers the proposed boundary modification does not meet this criterion. IUCN further considers that a revised proposal, supported by a clear rationale based on scientific information to include only the additional areas, has the potential to meet this criterion.

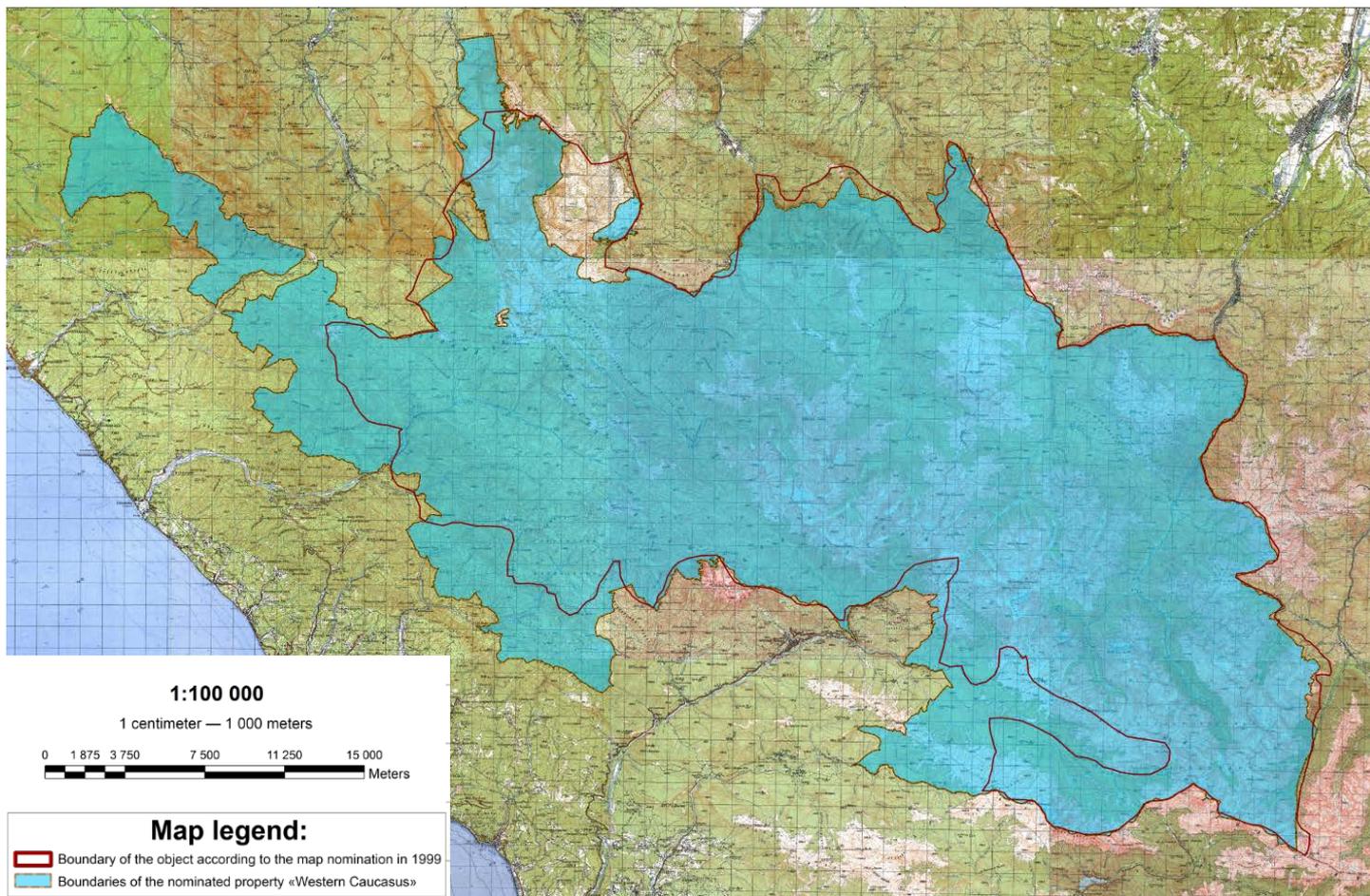
## **7. RECOMMENDATIONS**

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

The World Heritage Committee,

1. Having examined Documents WHC/16/40.COM/8B and WHC/16/40.COM/INF.8B2;
2. Recalling Decisions 32COM.7B.25, 34COM.7B.24, 35COM.7B.24, 36COM.7B.23, 37COM.7B.23 and 38COM.7B.23;
3. Does not approve the significant boundary modification of **Western Caucasus (Russian Federation)**;
4. Encourages the State Party to resubmit a nomination of the proposed extensions to the property within the Sochi National Park and the Sochi State Wildlife Sanctuary in order to enhance protection of the property including in relation to large-scale tourism infrastructure development, and to indicate how the additional areas contribute to strengthening the integrity of the property, and to also address the measures necessary to provide effective protection and management for those areas, in the context of an extended property;
5. Requests the State Party to implement fully the existing requests of the Committee in relation to the State of Conservation of the currently inscribed property, and its buffer zones and surrounding landscape.

**Map 1:** World Heritage Site and proposed Significant Boundary Modification





LATIN AMERICA / CARIBBEAN

## ARCHIPIÉLAGO DE REVILLAGIGEDO

MEXICO



*Manta birostris* in San Benedicto - © IUCN German Soler



# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## ARCHIPIÉLAGO DE REVILLAGIGEDO (MEXICO) – ID 1510

**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 (vii), (ix) and (x).

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

## 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 16 March 2015

**b) Additional information officially requested from and provided by the State Party:** A progress report was sent to the State Party on 16 December 2015 following the IUCN World Heritage Panel meeting. The letter reported on progress with the evaluation process and sought further information in a number of areas including the State Party's willingness to extend the marine no-take zone up to 12 nautical miles (nm) offshore from the islands to correspond with the outer boundaries of the nominated property; additional information on deep sea biodiversity and ecosystems within the nominated property and a comparative analysis of their values; and clarification on the numbers of endemic and threatened species within the property. The information in response was received from the State Party on 26 February 2016.

**c) Additional literature consulted:** Various sources including: Critical Ecosystem Partnership Fund (CEPF) 2015. *Biodiversity hotspots: Mesoamerica*. Downloaded from <http://www.cepf.net/resources/hotspots>, accessed in October 2015. Dutton, P.H., Jensen, M.P., Frey, A., Lacasella, E., Balazs, G.H., Zárate, P., Chassin-Noria, O., Sarti-Martinez, A.L. and Velez, E. 2014. *Population structure and phylogeography reveal pathways of colonization by a migratory marine reptile (Chelonia mydas) in the central and eastern Pacific*. *Ecol. Evo.* (22):4317-31. Hillary, A., Kokkonen, M. & Max, L. (2002). *Proceedings of the World Heritage Marine Biodiversity Workshop*. Hanoi, Viet Nam. Ketchum, J.T. and Bonilla, H.R. 2001. *Taxonomía y distribución de los corales hermatípicos (Scleractinia) del Archipiélago de Revillagigedo, México*. *Revista de Biología Tropical*, 49(3): 803–848. Wanless, R.M., Aguirre-muñoz, A., Angel, A., Jacobsen, J.K., Keitt, B.S. and McCann, J. 2009. *Birds of Clarion Island, Revillagigedo Archipelago, Mexico*. *The Wilson Journal of Ornithology*, 121(4): 745–751. Wilkenson, T., Wiken, E., Bezaury-Creel, J., Hourigan, T., Argardy, T., Herrmann, H., Janishevski, L., Madden, C., Morgan, L. and Padilla, M. 2009. *Marine Ecoregions of North America*. Jehl Jr, J. R., & Parkes, K.C. (1982). *The status of the avifauna of the Revillagigedo Islands, Mexico*. *Wilson Bulletin* 94(1):1-19. Reyes Bonilla, H., Ketchum Mejia, J. T., Cupul Magana, A. L & Alvarez del Castillo Cirdenas, P. A.

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**d) Consultations:** 10 desk reviews received. The mission also met with representatives of the State Party of Mexico; senior officials and staff of Mexico's protected area authority: Comisionado Nacional de Áreas Naturales Protegidas, (CONANP); and the Federal Attorney for Environmental Protection (Procuraduría Federal de Protección al Ambiente - PROFEPA). Meetings and interaction also took place with various NGOs, Universities, Conservation Foundations and Institutes including Grupo de Ecología y Conservación de Islas (GECI); Instituto del ciencias del mar y limnología (UNAM); Pelagios Kakunjá, A.C.; Universidad de Guadalajara; Fondo Mexicano para la Conservación de la Naturaleza (FMCN); and the WWF Marine Programme La Paz. The mission also consulted with military officials from the Mexican Navy including from the Socorro Naval Base.

**e) Field Visit:** German Soler and Wendy Strahm, 3-13 November, 2015

**f) Date of IUCN approval of this report:** April 2016

## 2. SUMMARY OF NATURAL VALUES

The nominated property Archipiélago de Revillagigedo is located in the eastern Pacific Ocean inside the Exclusive Economic Zone of Mexico, some 390 km southwest of the southern tip of the Baja California Peninsula, and 720 to 970 kms west of the Mexican mainland. Archipiélago de Revillagigedo is a serial nomination made up of four remote islands and their surrounding waters: Isla San Benedicto, Isla Socorro, Isla Roca Partida and Isla Clarión. The nominated area covers some 636,684 ha and includes a marine protected area extending 12 nm around each of the islands. A very large rectangular buffer zone of 14,186,420 ha surrounds all four nominated components. Ocean depths within the buffer zone of the nominated property reach 3,700 m, particularly to the west of Isla Roca Partida, and to the west and south of Isla Clarión. Due to their volcanic origin, depths around the islands increase abruptly at distances of between 10-12 kms from the island shorelines. Archipiélago de Revillagigedo is part of a submarine mountain range with the four islands representing the peaks of volcanoes emerging above sea level. Apart from two small naval bases, the islands are uninhabited.

The island landscape of the nominated property is striking with imposing cliffs, coastlines and volcanos, some of them very active. The highest volcano in Socorro rises 1,050 m above sea level and is very active with hydrothermal vents reaching the surface to produce clouds from the boiling waters. The Archipiélago de Revillagigedo was declared a Natural Protected Area and Mexican Biosphere Reserve in 1994. The reserve was also designated as a Ramsar wetland of international importance in 2004.

Isla Socorro, the largest and highest of the four islands, is a shield volcano, reported as the only silicic peralkaline volcanic island in the Pacific Ocean. The island is still volcanically active with the most recent activity recorded in 1993. On Isla San Benedicto, the Barcena volcano erupted in 1948 and 1952, denuding the island of all flora and fauna. Roca Partida is the smallest of the islands and also the crest of a submarine stratovolcano. Isla Clarión, the western most of the islands in the group, was formed by volcanic eruptions during the Miocene and older Eocene. The Clarion Fracture Zone was named for this island, and it is the first sub-aerial expression of the fracture zone as it approaches the Mexican mainland. The nomination asserts that the four islands of the nominated property are one of a few places worldwide which illustrate the geologic evolution process of island formation.

The Archipiélago de Revillagigedo represents an exceptional convergence of two marine biogeographic regions: the Northeastern Pacific and Eastern Pacific. More particularly, the property lies along the junction where the California and Equatorial current mix, generating a complex and highly productive transition zone. Due to its location, the Archipiélago de Revillagigedo strongly influences connectivity within

the Tropical Pacific Ocean and the islands are recognised as important stepping-stones and stop overs for migratory species.

The marine ecosystems of the archipelago are known to be largely undisturbed and harbour abundant populations of sharks, rays, and large pelagic fish that attract recreational divers from around the world. The surrounding waters host some of the largest aggregations of pelagic fauna in the world such as manta rays, tunas, turtles, whales and sharks. For millennia the archipelago has been a key breeding ground for the Humpback Whale (*Megaptera novaeangliae* - LC), and may host a separate sub-population from mainland Mexico. One of the most outstanding aspects of the property are the Giant Manta Rays (*Manta birostris* - VU) which aggregate around the islands. These animals exhibit behaviour which includes close up interest in divers that is reported nowhere else in the world. Furthermore, the seascape has sheer drops in crystal clear water and encompasses abyssal plains with depths down to 3,700 m all contributing to underwater scenes of great beauty.

Due to its geographic isolation, the Archipiélago de Revillagigedo supports functional species assemblages with a high level of endemism. Following a request for additional information on the endemic and threatened species found within the nominated property, the State Party provided an updated list of 61 endemic species. However, it is clear that there are gaps in biodiversity knowledge, for instance in deep sea areas, and species conservation assessments are still needed for plants and invertebrates.

Practically all of the terrestrial breeding birds on the islands are endemic (4 endemic species with 1 Extinct in the Wild); and 11 endemic subspecies, 2 Extinct) with only 2 or 3 recent bird introductions. Four endemic species of reptiles including 2 lizards and 2 snakes, and 9 invertebrates (with potentially many more once further studies are undertaken) have been recorded on the islands. It is noted that the Archipiélago de Revillagigedo exhibits the highest terrestrial endemism of any of the Mexican islands. Unique evolutionary strategies have developed, such as that of the Burrowing Owl (*Athene cunicularia* - LC), which after 200,000 years of isolation has adapted to survive with no terrestrial mammal prey. Revillagigedo is also regionally and globally important for seabirds with 46 species recorded as using the waters around the island, with 12 of these breeding, including the only known breeding site for the Critically Endangered Townsend's Shearwater (*Puffinus auricularis*). The islands are of great importance to seabirds with Masked, Blue-footed, Red-footed and Brown Boobies (LC), Red-billed Tropicbirds (LC), Magnificent Frigatebirds (LC) and many other species dependent on the island and sea habitats. Among the marine fauna, 251 fish species of which 10 endemic species have been recorded, as well as 22 species of scleratinian corals, 25 species of elasmobranchs, 4 species of sea turtle, 6 marine mammals and a high diversity of invertebrates, especially crustaceans and molluscs.

Plant diversity is less well-documented and, whilst overall species richness is low as is common in oceanic islands, the levels of plant endemism are high with 33 higher endemic plant species and 2 species of fungi recorded. The nomination reports that 31.6% of the plants on Socorro Island are endemic, 26% on Clarión and 45% on San Benedicto. The terrestrial vegetation is generally tropical and varies from island to island. Socorro as the largest island supports 9 vegetation associations including cloud forest, tropical dry forest, grasslands, shrublands and saltmarshes. Twenty-two species of marine algae have been recorded in the sub-tidal areas of the property.

Supplementary information has confirmed a total of 36 endemic species are included on the IUCN Red List with 22 of these species considered globally threatened (VU, EN or CR). The Archipiélago de Revillagigedo hosts particularly important numbers of threatened fish and bird species.

### 3. COMPARISONS WITH OTHER AREAS

The nomination included a comparative analysis which in most areas is considered logical and systematic. The nomination's analysis however, has some shortcomings, lacks detail, and also has some discrepancies in species data, which were evident and needed to be clarified, particularly regarding endemic and threatened species. The nomination reviews marine World Heritage sites narrowing these to comparable properties in the Pacific. Some 13 sites were chosen based on logical comparative criteria. It is clear that the nominated property has values which match or in some cases exceed these other inscribed sites. The Archipiélago de Revillagigedo is considered most comparable to Galápagos Islands in Ecuador and Malpelo Fauna and Flora Sanctuary in Colombia but is argued as being in better condition and suffering less from the impacts of invasive species and fishing.

Concerning criterion (vii) both the landscape and seascape of the Revillagigedo Archipelago exhibit impressive active volcanos, cliffs, arches, and a general landscape and underwater scenario which are all striking. The vision of Roca Partida, a lone guano-covered rock in the middle of nowhere, and the active volcano of San Benedicto with its bare lava with very little vegetation after its last eruption in 1952, is visually very impressive. On Socorro, the rock and soil of diverse geomorphology are of different colours and textures adding to the beauty of the landscape. The islands also serve as breeding grounds for the northern populations of Humpback Whales, which aggregate around the Archipelago's shallow waters during the winter months to mate and give birth to their young. The songs of these majestic cetaceans can be heard during the winter months while diving, adding another sensation to the already outstanding marine seascape. Two aspects of criterion (vii) need to be considered: firstly the superlative natural phenomenon, in this case the natural features and processes of the islands including active volcanism as well as the aggregations of marine life around the islands. Secondly the exceptional natural beauty and

aesthetics of the islands and their marine setting. It is clear on both counts that the Archipiélago de Revillagigedo has comparable values with other similar island systems in the Pacific. For example the Malpelo Fauna and Flora Sanctuary (Colombia) exhibits similar aggregations of large marine predators and pelagic species (Hammerhead, Silky and Whale Sharks as well as tuna). Cocos Island National Park (Costa Rica) is also well-known for its diving experiences with large numbers of sharks, rays, tuna and dolphins. These sites therefore share some charismatic species with the nominated property, however, the Archipiélago de Revillagigedo displays greater numbers within a wider range of pelagic and benthic habitats than these properties. The archipelago boasts the largest congregation of resident manta rays; the greatest diversity of sharks (20 species) in the Tropical Eastern Pacific; provides critical breeding for marine turtles (one of three main breeding grounds for the Green Turtle - *Chelonia mydas* (EN) in the Pacific Ocean); and is home to a wintering population of Humpback Whale. The unique interaction between divers and manta rays provides a special added dimension to the appreciation of the site's natural phenomena and beauty.

Unlike for the biodiversity values, which are its major focus, the nomination dossier does not provide commentary in the comparative analysis of the values of the site under criterion (viii). Reviewers note that there are both interesting volcanic and tectonic values, and also geological features that are not mentioned in the nomination, such as those related to coast geomorphology. There are some features that are distinctive in relation to other better known and more widely researched volcanic island systems included on the World Heritage List, such as sites in Hawai'i, the Canary Islands, Galápagos and Iceland. However the majority of reviewers (including those with a focus on geological values) do not support a case for Outstanding Universal Value under this criterion, noting that the features do not correspond to major geological themes related to volcanism or tectonism, and the main frame of reference taken for the justification of the criterion appears to be regional rather than global. In addition the claims that are made are of a relatively specialised nature. The nominated property is not recognised in past thematic studies as representing a gap under criterion (viii). Considerable further work would be needed with a large range of comparisons to consider if any revised case could be made under this criterion, however IUCN's conclusion based on the lack of justification in the nomination, and the mainly unfavourable views of desk reviewers, is that there is no basis for Outstanding Universal Value to be recognised under criterion (viii).

Comparative analysis, and further consideration by IUCN and UNEP-WCMC suggests there is a case for the Archipiélago de Revillagigedo's biodiversity values to meet World Heritage criteria. The Tropical East Pacific Province is one of the most represented marine provinces on the World Heritage List with three existing sites (Area de Conservación Guanacaste, Costa Rica; Cocos Island National Park, Costa Rica; and Coiba National Park and its Special Zone of

Marine Protection, Panama). However it is important to note that this Province is one of only two in the higher order Tropical Eastern Pacific Realm, the other being the Galapagos Province. Within the Tropical East Pacific Province, the nominated property belongs to its own marine ecoregion (Revillagigedo). The nominated property therefore lies within a distinctive marine ecosystem, one that is characterised by a transition zone where temperate nutrient rich waters from the Californian Current mix with warm waters from the North Equatorial Current, creating important stepping stones for the migration of marine species.

The presence of three other World Heritage sites in the same marine province means the Archipiélago de Revillagigedo has not been recognised as a gap in any of the recent IUCN/UNEP-WCMC themed studies. However, the Archipiélago de Revillagigedo was recognised in the Proceedings of a 2002 World Heritage Marine Biodiversity Workshop as one of 120 tropical coastal, marine and small island ecosystems that may merit consideration for inscription on the World Heritage List. The proceedings of this 2002 marine workshop highlighted the Archipiélago de Revillagigedo for its particular “biogeography and endemism; its charismatic mega-fauna; for being the only Eastern Pacific atoll; for constituting a stepping stone in migration of coastal marine species from the western to eastern Pacific; and for its highly intact marine ecosystems”. Based on the strong relationships to the application of criterion (x), IUCN considers that on balance a case can be made for inscription under criterion (ix), and this is supported by the high degree of integrity of the ecosystem.

The geographic isolation of the Archipiélago de Revillagigedo combined with specific oceanographic conditions has contributed to making the archipelago a unique site both for terrestrial and marine conservation and makes for a strong case for inscription under criterion (x). Despite low species richness, the nominated property encompasses high levels of endemism. The waters and islands of the archipelago are home to at least 94 endemic species (almost half of which are plant species), with one third of the terrestrial species being endemic. The property also hosts a large number of threatened species compared to seven other similar World Heritage properties in the Tropical East Pacific, Galapagos and Warm Temperate Northeast Pacific marine provinces. 80% of the fish species are globally threatened. Important marine phenomena also occur in the waters of the Archipiélago de Revillagigedo, including the largest aggregation of resident Manta Rays, the greatest diversity of sharks in the Tropical Eastern Pacific and a wintering sub-population of Humpback Whales. The Archipiélago de Revillagigedo is also the only breeding site of the endemic and Critically Endangered Townsend's Shearwater. The importance of Revillagigedo for rare species is evident in its ranking as one for the world's most irreplaceable protected areas. It ranks in 133<sup>th</sup> place for overall biodiversity and 94<sup>th</sup> with regards to threatened species. These rankings are very high when measured against the more than 173,000 protected areas assessed in this analysis.

The property hosts several globally threatened species on the IUCN Red List (2015) including the Clarion Wren (*Troglodytes tanneri* - VU), Socorro Mockingbird (*Mimus graysoni* - CR), Townsend's Shearwater (*Puffinus auricularis* - CR), Whale Shark (*Rhincodon typus* - VU), Dusky Shark (*Carcharhinus obscurus* - VU), Scalloped Hammerhead shark (*Sphyrna lewini* - EN) and Giant Manta Ray (*Manta birostris* - VU). The island of Socorro has been designated as an AZE (Alliance for Zero Extinction) and EBA (Endemic Bird Area) with the following trigger species: Socorro Mockingbird, Townsend's Shearwater and Socorro Wren. The islands of Revillagigedo have also been proposed as a marine Important Bird Area (IBA), however, this has not yet been confirmed.

In supplementary information the State Party has provided updated information on submarine and deep sea biodiversity. This notes that limited knowledge is available for this category of the property's biodiversity but recent research supports the probability that Revillagigedo has significant values in this realm also.

In summary, IUCN considers that comparative analysis supports the case that the nominated property meets criteria (vii), (ix) and (x).

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

The Archipiélago de Revillagigedo is Mexican federal territory and all parts of the nominated area are hence state-owned and controlled. In 1994 the Archipiélago de Revillagigedo was declared a protected area by Presidential decree under the designation of national Biosphere Reserve, and it was designated as a Ramsar site in 2004. The nominated property is protected under a range of legislation pertinent to different agency jurisdictions. The principal piece of protective legislation is the *General Law of Ecological Balance and the Protection of the Environment (LGEEPA)* and its regulations with respect to protected areas.

The islands are managed as a natural protected area by the Natural Commission of Natural Protected Areas (CONANP), an agency of Mexico's Secretariat of the Environment and Natural Resources (SEMARNAT). The property is managed in close collaboration with the Mexican Navy (SEMAR) which operates military bases on Socorro and Clarión Islands. The presence of the Navy strengthens the protection of the natural values of the property. In addition, dive boat operators collaborate with the authorities on reporting any fishing boats in the area.

The Mexican government has gone to great lengths to ensure the protection of these islands. The conservation of the area has strong inter-institutional support including the direct support of the Mexican Navy with infrastructure (including an airstrip) and full-time staff. The property also benefits from effective partnerships with several NGOs (GECI, WWF, Pelagios) and universities.

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

## 4.2 Boundaries

The boundaries of the nominated property extend 12 nm seaward from each of the four islands. The site design ensures that all the attributes of potential Outstanding Universal Value are included within the boundary and it is considered an adequate size for most of the populations of animals that reside within the property. However, it is important to note that pelagic species such as sharks, manta rays, cetaceans and tunas will transcend these boundaries on a regular basis. Hence it is essential that responsible fisheries management in the surrounding waters takes place in order to protect these species on their long inter-oceanic journeys. Currently the marine portion of the nominated property is divided into three zones (based on the zoning of the Biosphere Reserve). First, there is a core area (no-take) of 6 nm around each island where no fishing is allowed except for scientific purposes, 3.5 nm where fishing is not allowed (except for scientific purposes and fishing for aquariums) and finally 2.5 nm where fishing (commercial and sport fishing) is allowed under very strict permits given by the Mexican Government.

To ensure complete protection IUCN recommends the extension of the no-take fishing zone to 12 nm corresponding with the nominated area. In its supplementary information the State Party has confirmed its willingness to consider this extension of the no-take zone and has proposed, in collaboration with Mexico's Commission of Fisheries (CONAPESCA), to review the legal instruments that could lead to its formal establishment. Whilst no timeframes were provided it was noted that such agreement will be provided to the World Heritage Centre and IUCN when signed. In the meantime the State Party has indicated it will implement a number of actions leading to the establishment of the no-take zone including revision of the management plan and series of actions to improve protection and regulate diving and maritime traffic.

The nominated property has an enormous buffer zone of over 14 million ha which, if well-managed, would considerably increase the conservation value of the property. As is noted below, measures are needed to strengthen buffer zone management.

Whilst IUCN recommends that the entire marine area of the nominated property be covered by a no-take zone, it nevertheless considers that the boundaries of the property as nominated meet the requirements of the Operational Guidelines.

## 4.3 Management

As noted above CONANP is charged with the management of the nominated property. CONANP is an experienced and competent national level management body. They also work in close collaboration with a number of very active NGOs (in

particular GECI and Pelagios), universities, the private sector (dive companies) and the Mexican Navy to achieve management objectives. CONANP is adequately equipped to manage the property.

In 2014 the Secretariat of the Mexican Navy, SEMARNAT, and PROFEPA signed a collaboration agreement for the "Protection of Ecosystems and Natural Resources". This agreement enables inspection and surveillance measures in Mexico with special emphasis in the conservation of their environmental resources. One of the most important consequences is the mobilization of eight patrol boats for surveillance of Mexican waters.

Legally in Mexico every protected area needs to have an advisory committee composed of all stakeholders (representatives of the federal government, research institutions and academics, non-governmental organizations, and providers of tourist services) and in 2011 an advisory committee, meeting twice a year, was created for the Archipiélago de Revillagigedo.

The Management and Conservation Plan for the Archipiélago de Revillagigedo, published in 2007 and updated in 2012 with a legal requirement that it be updated every five years, is considered fully adequate for the management of the nominated property. The plan has monitoring measures in place particularly focused on alien invasive species (AIS) and effectiveness of AIS management programmes. Surveys on key indicators such as bird and lizard abundance are being undertaken. The plan appropriately emphasizes the importance of interagency cooperation to support surveillance and protection. Of positive note, since 2013 work plans have been jointly implemented by relevant authorities including SEMAR, SEMARNAT, PROFEPA, the Commission of Fisheries (CONAPESCA) and CONANP. Through its supplementary information the State Party has indicated the management plan will be reviewed to consider recommendations proposed by the IUCN mission, including the revision of administrative regulations to exclude fishing activities and better control tourism.

The Reserve receives what appears to be only modest annual operational funding from the federal government (USD 9,000-18,000 p.a.). Staff salaries are separately funded and the government allocation is supplemented by funding from various sources, much of it linked to projects such as the Conservation Program for Sustainable Development (PROCOCES) on baseline invertebrate studies or the Conservation Program for Species at Risk (PROCER) which focuses on habitat restoration for the endemic Socorro Dove. Other special purpose funding comes from NGOs, research institutes, international aid and foundations. The evaluation mission learned of funding to construct a biological research station linked to the Naval station on Socorro. Funding can also be raised from the Fondo Mexicano para la Conservación de la Naturaleza, an endowment fund that contributes to protected area conservation. In sum the modest government funding is supplemented such that an

annual budget of USD 43,000 was available to the property in 2015.

The nomination dossier is inconsistent in its information on staffing levels but CONANP has 6-8 permanent staff supplemented by a number of volunteers to cope with seasonal tours demand. Staff numbers are low given the large size of the property and vast surrounding marine buffer zone. This limited capacity within CONANP highlights the importance of effective interagency collaboration. The joint work with the Navy is critical to boost management presence.

The State Party has reported a number of new management proposals including proposals to purchase new patrol boats and surveillance drones and the introduction of GPS tracking to monitor sport fishing and to explore catch and release recreational fishing in cooperation with CONAPESCA. CONANP will also discuss with the Mexican Navy options to deal with solid waste and waste water to reduce impact to the surrounding areas as well as to explore the use of renewable energy and sustainable practices.

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

#### 4.4 Community

The nominated property is uninhabited apart from the presence of a Mexican Navy station on Socorro (around 100 people) and a very small base on Clarión (around 10 people). There are thus no known issues concerning community tenure or rights. As noted above the Advisory Committee established for the Archipiélago de Revillagigedo fulfills a stakeholder engagement function to ensure some broader input into the management of the nominated property.

#### 4.5 Threats

The Archipiélago de Revillagigedo is remote and largely uninhabited so threats are relatively low. The naval station on Socorro has resulted in localized impact surrounding the base, 8 km of sealed road, a recently reconstructed 1.6 km airstrip, and a 70m long port capable of docking a medium-sized battleship. A number of invasive animals were introduced to the islands as a result of this human occupation.

The greatest threat to the islands is introduced species. Major conservation successes by the Mexican Government working with NGOs have seen the eradication of pigs and sheep from Clarión in 2002, and sheep from Socorro by 2010. Unfortunately rabbits (and iguanas) remain on Clarión, and cats and mice on Socorro. However, it must be stressed that no rats have ever reached the Archipiélago de Revillagigedo, which is extremely rare and fortuitous in a tropical island system. There are also some potentially invasive plant species, including some grass species and a relatively small area of guava (*Psidium guaiava*) which should be removed. These invasive species cause great damage by increasing erosion, predating native species and out-competing or hybridising with

native vegetation. However, the single largest threat to the islands is the potential introduction of rats to Socorro, given that the naval base is resupplied every 2 weeks, and at times large ships dock at the port. The mission was informed that a biosecurity plan had received GEF funding and would soon be prepared. There is strong commitment evident on the part of concerned authorities to ensure that no new invasives arrive on the islands but this will require constant vigilance.

To date tourism has been restricted by the Mexican Government to a set number of diving boats, and no people are allowed on-shore without a permit. A 2014 study estimated the diving carrying capacity at approximately 33,400 dives per season, however, surveys suggest actual figures maybe as high as 53,300 dives per season. Diving regulations are set in the management plan, and given the restricted number of potential dive sites and their small area, it is unlikely that diving impacts within the nominated area will increase. The mission strongly advised that no new dive boat permits be issued in order to reduce future pressures from ecotourism. It would also be useful to introduce a system for installing and maintaining permanent anchor points for the dive boats, which station themselves in the same places at a limited number of dive sites.

Fishing is restricted through the marine area zoning system, however, there are concerns regarding policing and instances of sport fishing. For example a "sport fishing fleet" of around 10 vessels from San Diego, USA, conducts several trips per year, capturing large amounts of fish which is then sold in the United States. Improved monitoring is needed to prevent sport fishers entering no fishing zones and to manage their impacts and the possibility noted above of GPS tracking should be advanced. Enhanced measures are also needed to differentiate uses and controls in the buffer zone as opposed to marine areas outside. At present the buffer zone is simply a line on a map and there seems to be no appreciable difference between what one can do inside versus outside the buffer zone. If fishing in the large proposed buffer zone was managed to be sustainable, this would counteract the potential or real threat of over-fishing in the region.

Finally occasional fires (it would seem from the naval stations, lightning, or volcanic activity) were listed as a potential threat and seem to have been a problem in areas where herbivore grazing reduced the native vegetation to introduced grasses (particularly on Clarión). The nomination notes that the removal of sheep as well as rabbits, which is considered as a priority action for Clarión, will diminish the fire risk, plus naval personnel are trained in fire-fighting.

In conclusion the nominated property is of adequate size and includes all elements necessary to express its outstanding values in the terrestrial and marine realms. Integrity of the marine area will be further strengthened if the entire area of the property becomes a no-take zone, and fishing regulations are strengthened in the large proposed buffer zone. For terrestrial values it must be noted that past development, i.e. the

introduction of invasive sheep, pigs, cats, rabbits and mice, have considerably damaged some of its values, but rats were never introduced to the islands which is exceptional for subtropical islands of this size. It is to be commended that pigs and sheep have been eradicated and the numbers of cats on Socorro have been severely reduced with the hope that they too will be eradicated.

CONANP, the site managers, and all its partners are well-organised and committed to protecting the property and there are long-term regulatory as well as financial procedures in place to ensure that its values and integrity are maintained and improved. Government funding should be increased to ensure it is adequate and sustainable to guard against over-dependence on short-term, project-dependent funding from a variety of sources.

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

## 5. ADDITIONAL COMMENTS

### 5.1 Justification to serial approach

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

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

A serial configuration is appropriate given the vast marine areas involved in any contiguous design which would connect all four islands. The proposed site design is thus considered a feasible approach to protecting the values of this region in a way that is manageable. All of the four islands are necessary to illustrate the Archipiélago de Revillagigedo's ongoing evolutionary processes and endemism, especially as from the terrestrial point of view there are endemic species (or subspecies) specific to each island. Each island has its own particular characteristics that collectively add to the Outstanding Universal Value of the property as a whole. The connectivity of the Archipiélago de Revillagigedo is crucial to some of the more mobile species such as sharks, whales, manta rays, tuna and birdlife which migrate from one area to another and indeed in some cases from much further afield.

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

The islands are functionally linked given that they are connected by the vast marine buffer zone, with the marine species moving between the islands. Many species overlaps occur between the different components of the property, while each island also has a particular suite of species depending on variations in volcanic activity and ecological characteristics. The interconnecting massive buffer zone supports the dynamics of this extensive marine and island system.

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

The nominated area is managed as a single entity under a common management plan and single managing agency CONANP.

## 6. APPLICATION OF CRITERIA

The **Archipiélago de Revillagigedo** has been nominated under all four natural criteria (vii), (viii), (ix) and (x).

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

Both the landscape and seascape of the Archipiélago de Revillagigedo exhibit impressive active volcanos, arches, cliffs, and isolated rock outcrops emerging from the middle of the ocean. The clear surrounding waters create exceptional scenic vistas with large aggregations of fish gathering around the steep walls and seamounts, as well as large pelagic marine species including Giant Manta Rays, whales, dolphins and sharks. One of the most remarkable aspects of the property is the concentration of the Giant Manta Rays which aggregate around the islands and interact with divers in a special way that is rarely found anywhere in the world. Furthermore, the property encompasses an underwater seascape with abyssal plains at depths close to 4,000 meters and sheer drops in crystal clear water, all contributing to an awe-inspiring underwater experience. A large population of up to 2,000 Humpback Whales visit the islands. The songs of these majestic cetaceans can be heard during the winter months and while diving, add another sensory dimension to the marine seascape.

IUCN considers that the nominated property meets this criterion.

#### Criterion (viii): Earth history and geological processes

The nominated property provides well-exposed and pristine evidence of the interaction between geological processes and oceanic erosion in the formation of volcanic islands, and a range of features of geological interest, including some that are not described in the nomination document. However the claims made for global significance are not supported by convincing comparative analysis in the nomination, and appear to not demonstrate as strong a level of scientific interest as better known sites, such as those in Hawai'i, the Canary Islands, Galápagos and Iceland. The main frame of reference taken for the justification of the criterion appears to be regional rather than global, and the nominated property is not recognised in past thematic studies as representing a gap under criterion (viii). Whilst further work would be needed to consider if any revised case could be considered under this criterion, based on the lack of justification in the nomination, and the mainly unfavourable views of desk

reviewers, there does not appear to be a basis for Outstanding Universal Value to be recognised under criterion (viii).

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

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

The Archipiélago de Revillagigedo is located in the northern part of the Tropical East Pacific Province, a transitional zone influenced mainly by the California current but mixed with the warm waters from the North Equatorial Current. This location results in the convergence of a multitude of fauna and flora, and creates a unique set of biological and ecological processes. The isolation and relatively pristine state of these islands has supported evolutionary processes which result in a high degree of endemism in both the terrestrial as well as marine realms. In the marine realm the waters surrounding these islands are composed of majestic aggregations of sharks, rays, cetaceans, turtles and fish, a number of which are endemic or near-endemic. On land, important evolutionary processes have led to the speciation of two endemic lizards, two endemic snakes, 4 endemic birds, at least 33 endemic plant species, and innumerable invertebrates. In addition, 11 endemic subspecies of birds have evolved on the islands, indicating the potential for future evolution on these remote and well protected islands.

IUCN considers that the nominated property meets this criterion.

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

The geographic isolation of the Archipiélago de Revillagigedo, shaped by the prevailing oceanographic conditions, results in high marine productivity, rich biodiversity and exceptional levels of endemism, both terrestrial and marine. The islands are the only breeding site for the Townsend's Shearwater, one of the rarest seabirds in the world. The Archipiélago de Revillagigedo is also home to numerous endemic species which include the Socorro Dove, Socorro Mockingbird, Socorro Wren, Clarión Wren (as well as 11 endemic bird subspecies), 2 lizards, 2 snakes, and numerous endemic plants and invertebrates, all which contribute to the importance of these islands in conserving terrestrial biodiversity. In the marine realm at least 10 reef fish species have been identified as endemic or near-endemic including the spectacular Clarión Angelfish (VU), which can be observed in 'cleaning stations' feeding on the ectoparasites of the Giant Manta Rays. These rays, some of them unusually completely black, aggregate in some of the largest numbers known worldwide. The property is a haven for a rich diversity of shark species with up to 20 having been recorded. Up to 2,000 Humpback Whales also migrate through these nutrient rich and productive waters. The islands are also of significant importance to seabirds notably Masked, Blue-footed, Red-footed and Brown Boobies, Red-billed Tropicbirds, Magnificent Frigatebirds and many other species which can be seen soaring around the rocky outcrops where they nest and fish in the sea.

IUCN considers that the nominated property meets this criterion.

## **7. RECOMMENDATIONS**

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

The World Heritage Committee,

1. Having examined Documents WHC/16/40.COM/8B and WHC/16/40.COM/INF.8B2,
2. Inscribes the **Archipiélago de Revillagigedo (Mexico)** on the World Heritage List under natural criteria (vii), (ix) and (x);
3. Adopts the following Statement of Outstanding Universal Value:

#### **Brief synthesis**

*The Archipiélago de Revillagigedo is located in the eastern Pacific Ocean, some 390 km southwest of the southern tip of the Baja California Peninsula, and 720 to 970 km west of the Mexican mainland. The Archipiélago de Revillagigedo is a serial nomination made up of four remote islands and their surrounding waters: Isla San Benedicto, Isla Socorro, Isla Roca Partida and Isla Clarión. The property covers some 636,684 hectares (ha) and includes a marine protected area extending 12 nautical miles around each of the islands. A very large buffer zone of 14,186,420 ha surrounds all four islands. Ocean depths within the buffer zone of the property reach 3.7 km, particularly to the west of Isla Roca Partida, and to the west and south of Isla Clarión. Due to their volcanic origin, depths around the islands increase abruptly at distances of between 10-12 km from the island shorelines. The Archipiélago de Revillagigedo is part of a submarine mountain range with the four islands representing the peaks of volcanoes emerging above sea level. Apart from two small naval bases, the islands are uninhabited.*

*The Archipiélago de Revillagigedo represents an exceptional convergence of two marine biogeographic regions: the Northeastern Pacific and Eastern Pacific. More particularly, the property lies along the junction where the California and Equatorial current mix generating a complex and highly productive transition zone. The islands and surrounding waters of the Archipiélago de Revillagigedo are rich in marine life and recognised as important stepping-stones and stop overs for wide ranging species. The property harbours abundant populations of sharks, rays, large pelagic fish, Humpback Whales, turtles and manta rays; a concentration of wildlife that attracts recreational divers from around the world.*

*Each of the islands displays characteristic terrestrial flora and fauna and their relative isolation has resulted in high levels of species endemism and micro-endemism, particularly among fish and bird species, many of which are globally threatened. The islands provide critical habitat for a range of terrestrial and*

marine creatures and are of particular importance to seabirds with Masked, Blue-footed, Red-footed and Brown Boobies, Red-billed Tropicbirds, Magnificent Frigatebirds and many other species dependent on the island and sea habitats. The Archipiélago de Revillagigedo is the only place in the world where the critically endangered Townsend's Shearwater breeds.

### **Criteria**

#### **Criterion (vii)**

Both the landscape and seascape of the Archipiélago de Revillagigedo exhibit impressive active volcanos, arches, cliffs, and isolated rock outcrops emerging from the middle of the ocean. The clear surrounding waters create exceptional scenic vistas with large aggregations of fish gathering around the steep walls and seamounts, as well as large pelagic marine species including Giant Manta Rays, whales, dolphins and sharks. One of the most remarkable aspects of the property is the concentration the Giant Manta Rays which aggregate around the islands and interact with divers in a special way that is rarely found anywhere in the world. Furthermore, the property encompasses an underwater seascape with abyssal plains at depths close to 4,000 meters and sheer drops in crystal clear water, all contributing to an awe-inspiring underwater experience. A large population of up to 2,000 Humpback Whales visits the islands. The songs of these majestic cetaceans can be heard during the winter months and while diving, add another sensory dimension to the marine seascape.

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

The Archipiélago de Revillagigedo is located in the northern part of the Tropical East Pacific Province, a transitional zone influenced mainly by the California current but mixed with the warm waters from the North Equatorial Current. This location results in the convergence of a multitude of fauna and flora, and creates a unique set of biological and ecological processes. The isolation and relatively pristine state of these islands has supported evolutionary processes which result in a high degree of endemism in both the terrestrial as well as marine realms. In the marine realm the waters surrounding these islands are composed of majestic aggregations of sharks, rays, cetaceans, turtles and fish, a number of which are endemic or near-endemic. On land, important evolutionary processes have led to the speciation of 2 endemic lizards, 2 endemic snakes, 4 endemic birds, at least 33 endemic plant species, and innumerable invertebrates. In addition, 11 endemic subspecies of birds have evolved on the islands, indicating the potential for future evolution on these remote and well protected islands.

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

The geographic isolation of the Archipiélago de Revillagigedo, shaped by the prevailing oceanographic conditions, results in high marine productivity, rich biodiversity and exceptional levels of endemism, both terrestrial and marine. The islands are the only breeding site for the Townsend's Shearwater, one of the rarest seabirds in the world. The Archipiélago de Revillagigedo is also home to the endemic Socorro

Dove, Socorro Mockingbird, Socorro Wren, Clarion Wren (as well as 11 endemic bird subspecies), 2 lizards, 2 snakes and numerous endemic plants and invertebrates, all of which contribute to the importance of these islands in conserving terrestrial biodiversity. In the marine realm at least 10 reef fish species have been identified as endemic or near-endemic including the spectacular Clarión Angelfish, which can be observed in 'cleaning stations' feeding on the ectoparasites of the Giant Manta Rays. These rays, some of them unusually completely black, aggregate in some of the largest numbers known worldwide. The property is a haven for a rich diversity of shark species with up to 20 having been recorded. Up to 2,000 Humpback Whales also migrate through these nutrient rich and productive waters. The islands are also of significant importance to seabirds notably Masked, Blue-footed, Red-footed and Brown Boobies, Red-billed Tropicbirds, Magnificent Frigatebirds and many other species which can be seen soaring around the rocky outcrops where they nest and fish in the sea.

#### **Integrity**

The Archipiélago de Revillagigedo is remote and largely uninhabited so threats to the property are relatively low. Invasive introduced species represent the greatest threat to the ecology of these islands and their surrounding waters. Major conservation successes by the Mexican Government working with NGOs have seen the eradication of larger invasives such as pigs and sheep from various islands. Ongoing vigilance will be needed to ensure the natural systems of the archipelago are not impacted by damaging invasive species. Enhanced biosecurity measures directed by a biosecurity plan are required to protect the ecosystems of the archipelago from this threat.

To date tourism has been restricted by the Mexican Government to a set number of diving boats, and no people are allowed on-shore without a permit. Diving carrying capacities and regulations are set in the management plan, and given the restricted number of potential dive sites and their small area, it is unlikely that diving impacts within the nominated area will increase. Fishing is restricted through the marine area zoning system, however, there are concerns regarding policing and instances of sport fishing. The extension of a no-take fishing zone by 12 nautical miles to align with the property boundaries is considered essential to bolster protection of the island's marine resources as is the enforcement of strengthened fishing regulations in the property's large buffer zone.

In conclusion the nominated property is of adequate size and includes all elements necessary to express its outstanding values in the terrestrial and marine realms. Integrity of the marine area will be further strengthened if the entire area of the property becomes a no-take zone, and fishing regulations are strengthened in the large proposed buffer zone. For terrestrial values it must be noted that past development, i.e. the introduction of invasive sheep, pigs, cats, rabbits and mice, have considerably damaged some of its values, but rats were never introduced to the islands which is exceptional for subtropical islands of this size. It is to

*be commended that pigs and sheep have been eradicated and the numbers of cats on Socorro have been severely reduced with the hope that they too will be eradicated.*

#### **Protection and Management requirements**

*The Archipiélago de Revillagigedo is Mexican federal territory and all parts of the property are hence state owned and controlled. The property is protected under a range of legislation pertinent to different agency jurisdictions with the principle protective legislation being the General Law of Ecological Balance and the Protection of the Environment (LGEEPA). The islands are managed as a natural protected area by the Natural Commission of Natural Protected Areas (CONANP) in close collaboration with a number of other government authorities and various NGO and university partners. Of particular importance is the effective collaboration with the Mexican Navy who provide staffing and infrastructure support to monitor the islands and ensure the enforcement of regulations. This cooperation among agencies is doubly important to augment relatively modest staffing and government financial resources which are applied to the property.*

*Improved monitoring is needed to prevent sport fishers entering no fishing zones and to manage their impacts. Efforts are also needed to ensure that fishing in the very large surrounding buffer zone is managed to be sustainable so as to counteract the potential or real threat of over-fishing in the region.*

*Management emphasis should be applied to the control and where possible eradication of alien invasive species from the islands and their marine environments. A biosecurity plan should also direct quarantining and response mechanisms to ensure protection from potential introduction threats. This is particularly important to maintain the island's rat free status which is both unusual in a sub-tropical island system and crucial to maintaining healthy functioning ecosystems and protecting key species.*

*Additional research and inventory is needed to better understand the biodiversity values of the property in particular submarine and deep sea ecosystems.*

4. Requests the State Party, in order to further strengthen the integrity and long term management of the property, to:

- a) increase legal protection and revise the management plan in order to extend the no-take zone to 12 nautical miles from the islands, thereby aligning it to the boundary of property;
- b) strengthen monitoring and targeted management of alien invasive species within the property and introduce and rigorously implement a biosecurity plan to guard against the future spread of introduced species;
- c) ensure careful management of tourism in anticipation of future increases in the activities of recreational divers in order mitigate adverse impacts on marine environments and important species such as Humpback Whales and Giant Manta Rays;
- d) install, with the support of the diving boat operators, a limited number of permanent mooring buoys in agreed and limited locations, to reduce the impact of anchoring and to prohibit anchoring outside of these locations; and
- e) undertake further research into the property's biodiversity and ecology particularly in sub-marine and deep sea ecosystems in order to better understand and manage for the protection of the full marine resources of the property.

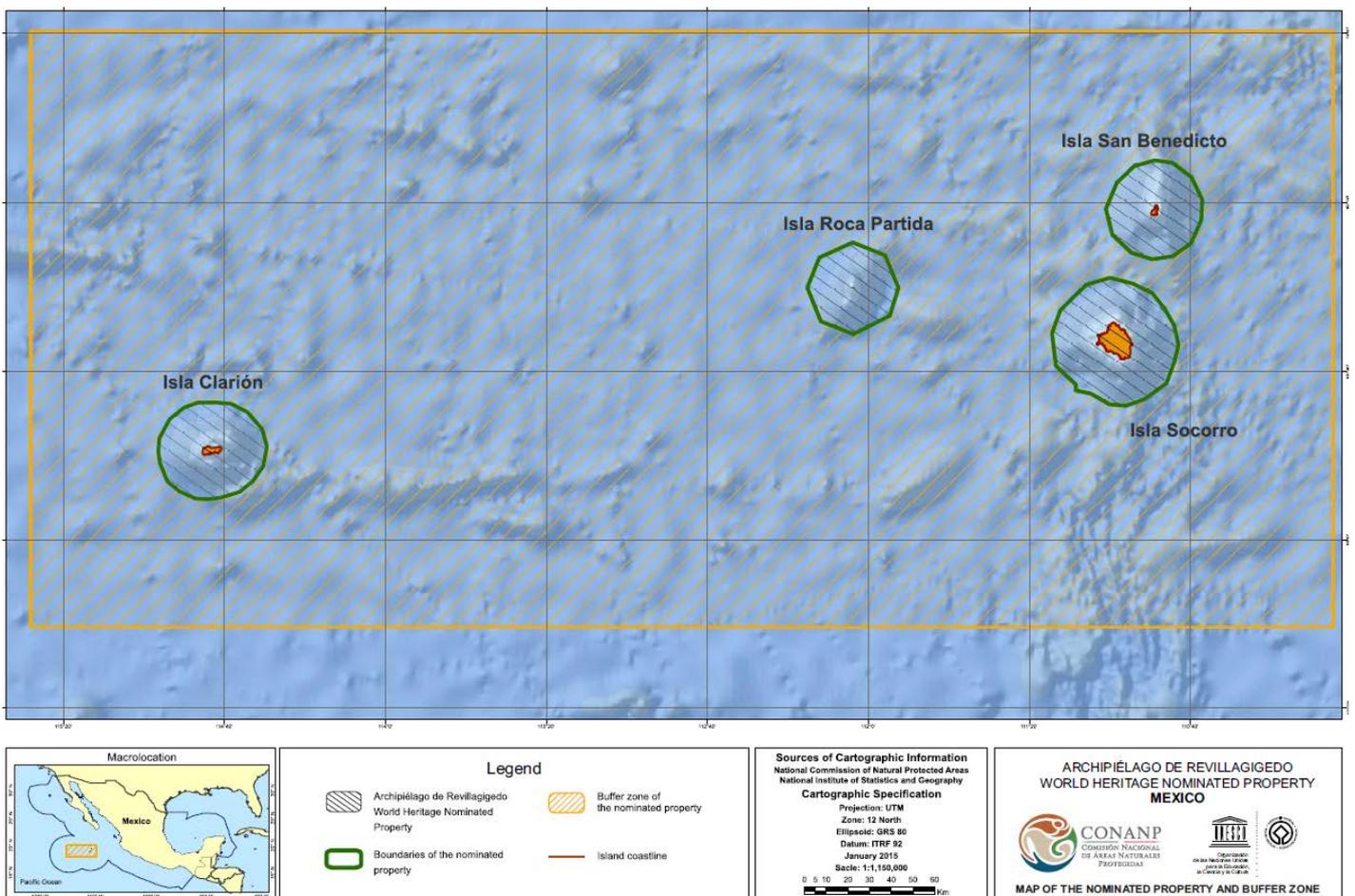
5. Commends the State Party for establishing strong inter-agency collaboration to protect the property and encourages strengthened cooperation particularly with the Mexican Navy and the Commission of Fisheries (CONAPESCA) to tighten uses and controls in the buffer zone; to improve capacity to address illegal fishing including sport fishing; to regulate diving activity; and to provide effective biosecurity measures for the property.

6. Request the State Party to provide to the World Heritage Centre a report on progress regarding the establishment of the extended no-take zone; improved monitoring and regulation of fishing; proposed improvements to overall management capacity, improved biosecurity measures and other matters by 01 December 2018, for review by IUCN.

**Map 1:** Location of the nominated property in the Pacific Ocean



**Map 2:** Nominated property (4 components) and buffer zone





## **B. MIXED PROPERTIES**

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



**AFRICA**

# **ENNEDI MASSIF: NATURAL AND CULTURAL LANDSCAPE**

**CHAD**



Aloba Arch - © IUCN Guy Debonnet



## WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

### ENNEDI MASSIF: NATURAL AND CULTURAL LANDSCAPE (CHAD) – ID No. 1475

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

**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.

**Explanatory note on boundaries of the nomination:** The nominated area and buffer zone of the nominated property have been revised on two occasions in the course of the evaluation. The first changes occurred after the first request for supplementary information submitted by ICOMOS on 28 September 2015, and new maps were shared by the State Party to the ICOMOS Panel during their discussion on the nomination dossier on 28 November 2015. The core zone was mostly increased in the North-West and South-East, and the buffer zone was modified to surround the entire property, with a major addition to the West, when it was only covering a minor area around Fada in the original submission. This is referred to in the report as the “interim boundary” of the nomination and was not officially communicated to IUCN, and was not evaluated formally by the IUCN World Heritage Panel.

The second set of changes occurred following the joint IUCN and ICOMOS progress report and request for supplementary information sent on 16 December 2015. The State Party responded to this letter on 25 February 2016 and submitted yet another map. This time the nominated area was cut in the North to follow the 17<sup>th</sup> Parallel North, reducing the area from 3 044 500 ha in the original nomination to 2 441 200 ha, i.e. a reduction of about 20%. The buffer zone was fully removed from the North, and reduced to a 1km only corridor to the East and South, while the Western buffer zone remained more or less as it was submitted on 28 November 2015 to ICOMOS. This is the final boundary of the nomination, and it is this boundary that has been evaluated below.

The State Party indicates that this last minute substantial change in boundaries is motivated by the fact that an oil exploration concession was granted in this area. This substantial reduction of the nominated property removes significant attributes of potential Outstanding Universal Value, and impacts the integrity and effective management of the property, as discussed in the below report.

#### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 16 March 2015

**b) Additional information officially requested from and provided by the State Party:** Following the IUCN World Heritage Panel a joint progress report with ICOMOS was sent to the State Party on 16 December 2015. Further information was sought on a range of matters including the need of a further analysis of biological characteristics for criterion (ix), adaptation of the boundaries to include additional areas, institutional governance and traditional management by local communities. The State Party responded on 25 February 2016. It is noted that the information most recently provided by the State Party's includes a major change to the proposed boundaries of the property, reducing substantially the nominated area, and this is discussed in the below report.

**c) Additional literature consulted:** Various sources, including Goudie, A. and Seely, M. (2011) *World Heritage Desert Landscapes: Potential Priorities for the Recognition of Desert Landscapes and Geomorphological Sites on the World Heritage List*.

IUCN, Gland. Mitchell, NI (2013) *Study on the Application of Criterion (vii)*. IUCN, Gland. Hekkala, E., Shirley, M., Amato G., Austin J., Charter S., Thorbjarnarson J., Vliet, K. Houck M., Desalle R. and Blum M. (2011). *An ancient icon reveals new mysteries: mummy DNA resurrects a cryptic species within the Nile Crocodile*. *Molecular Ecology* 20, 4199 – 4215. Britto J., Martinez-Freiria F., Sierra P., Sillero N., Tarroso P., Fenton B. (2011). *Crocodiles in the Sahara Desert: An Update of Distribution, Habitats and Population Status for Conservation Planning in Mauretania*, PLoS ONE, e14734. IUCN evaluation of Tassili n'Ajjer (Algeria), Air and Ténéré Natural Reserves (Niger), Wadi Rum (Jordan). Tubiana, J. (1999), *Les crocodiles de l'Ennedi*, Le Point.

**d) Consultations:** 8 desk reviews received. The mission met with the Governor, Prefect, and Sub-Prefect of Fada; the district chief representative; the Director of Biodiversity Conservation of National Parks and Hunting, Ministry of Environment, Delegation of the European Union in the Republic of Chad; the Minister of Culture and the General Secretary of the Ministry of Culture, Youth and Sports; the General Secretary of the Chad National Commission for UNESCO; the Head of the Rural Development and

Food Security section; representatives from the technical committee, NGOs, religious authorities, experts involved in the nomination. The mission met with the National World Heritage Committee and some representatives of local communities.

**e) Field Visit:** Guy Debonnet (IUCN) and Christian Dupuy (ICOMOS), 4 to 15 October 2015

**f) Date of IUCN approval of this report:** April 2015

## 2. SUMMARY OF NATURAL VALUES

The Ennedi mountains are situated in north-eastern Chad, in the administrative regions of “Ennedi - Est” and “Ennedi - Ouest”. The Ennedi mountains are one of the six major mountain massifs rising out of the Sahara Desert, which is the largest hot desert and one of the most inhospitable regions in the world.

While the originally nominated property “Massif de l’Ennedi: paysage naturel et culturel” (Ennedi Massif) covered most of the massif, the final configuration proposed by the State Party of an area of 2 441 200 ha excises the entire northern part of the mountains. The proposed boundaries to a large extent follow the contours of the mountain landscape, except to the North where the State Party amended the boundaries during the evaluation process, and now follow a straight line boundary on the 17<sup>th</sup> Parallel North which does not respect ecological, physical or landscape features. A buffer zone was originally only proposed in the area surrounding the regional capital of Fada, as the State Party considered this was the only area of potential pressure on the property. This buffer zone has also been revised during the evaluation process following feedback from IUCN and ICOMOS and now encompasses 777 800 ha and surrounds the Western, Southern and Eastern borders of the property to minimize potential pressure on the property. Following the most recent amendments to the boundaries, there is no buffer zone on the Northern border and a 1km only corridor to the East and South.

The Ennedi mountains are located in the eastern part of the Sahara and are 1450 m at their highest point; rainfall is estimated between 50 and 150 mm per year but varies greatly according to location and exposure. The mountains create a rapid climatic transition in the space of a few kilometres from hyper-arid conditions to semiarid conditions. Such climatic variations normally stretch over hundreds of kilometres.

The Ennedi massif is composed of sandstone resting on a granitic Precambrian base. Over time, water and wind erosion sculpted the Ennedi plateau, cutting steep canyons and valleys, and creating spectacular landscapes with dramatic and scenically extremely impressive features, including natural arches, rock pillars peaks and cliffs. In larger canyons, permanent water is held in so called Gueltas (notably Archei, Bashikélé, Maya and Koboué), and these play an important role in the ecosystem and are critical for the survival of fauna, flora and people.

Numerous rock paintings and archaeological sites testify to the ancient human occupation and the wetter conditions which prevailed in the Ennedi mountains as a result of its unique orographic position. The current semi-arid conditions in the massif have allowed species of plants and animals which inhabited the wider region when climatic conditions were more favorable to continue to survive in the mountains today. Relict species also occur, mostly trees, which are survivors of the ancient times although they are not capable of reproducing. In the Ennedi gueltas and canyons, a variety of plants and animals is found, far away from their normal distribution ranges in the sub-tropics and tropics; the massif has been dubbed the Garden of Eden of the Sahara.

One of the most striking conservation features is the small population of crocodiles, estimated at around 10 individuals, which live in the Guelta Archei. During the last glacial period when wetter conditions prevailed, the hydrological and river system of the Ennedi mountains was connected to other river systems to east and the west; these fluvial connections allowed crocodiles to move into the region. With the return of the drier conditions, these fluvial connections dried out and only a small population was able to survive in the Ennedi refugium, thanks to the presence of permanent water in the Guelta Archei.

## 3. COMPARISONS WITH OTHER AREAS

The originally submitted comparative analysis was very weak, especially for criterion (ix). However a strengthened comparative analysis for criterion (ix) was provided as part of the supplementary information requested by IUCN, and has been further extended during the evaluation by the IUCN World Heritage Panel.

With respect to criterion (vii), the Ennedi Massif as a whole is undoubtedly of great significance and IUCN’s highly experienced field mission, together with the input of reviewers, testify to the exceptional and impressive natural landscape of a very large scale in the original nomination. IUCN notes the range of rock formations, many of which are outstanding on their own, but are notable for the very large number and density of these phenomena, creating a truly unique landscape of high aesthetic quality and diverse and changing vistas.

The property compares favourably to the World Heritage site of Wadi Rum (Jordan) which is also a desert landscape of great beauty. The Ennedi has both greater scope and a greater variety of landscapes, and is much more natural, remote and isolated. In Twyfelfontein in Namibia, listed as a World Heritage Site for its cultural values, the sandstone formations are less impressive and the tourism impact stronger than Ennedi.

The site contains very large concentration of rock arches, probably only exceeded by Arches National Park in the USA. With a height of 120 metres, the Aloba stone arch is reportedly the second highest

stone arch in the world, after Shipton's Arch in Western China which stands at 365 m. With a span of 77 meters, Aloba Arch is also amongst the widest known natural arches in the world. These features together with the phenomenon of the gueltas also contrast favourably with the World Heritage listed areas of Aïr Ténéré (Niger) and Tassili n'Ajjer (Algeria), both of which are recognised under criterion (vii). The Ennedi, as a whole, can be seen to be of at least equivalent scenic beauty to either of these two sites. The Aïr Mountains are geologically very different and the scenic beauty of the site is linked to different landscape phenomena such as the impressive dune landscape of the Ténéré desert and also to the mountains of the Aïr, characterized by cipollino marble outcroppings, which have a distinct bluish color. The mountain range of Tassili n'Ajjer is characterized by eroded sandstone forming so-called rock forest (sometimes called tassilian landforms) and is therefore more comparable to the Ennedi. However, the area is of a different character, with more human use and interactions, and subsequent impacts, reflected in its listing for natural and cultural values.

Different mountain ranges in the Sahara present similar characteristics and all are serving as refugia to some extent. This is in particular the case for the Tibesti (Chad), Hoggar (Algeria), Tassili n'Ajjer (Algeria), Aïr (Niger), Gilf Kebir (Egypt) and Djebel Ouweinat (Egypt/Sudan/Libya) massifs. However, the nomination file shows that, of these, the species diversity is the highest in the Ennedi (526 species); the species density of Ennedi is second highest and it is also the only one of these massifs which still harbours a relict crocodile population.

Only Tibesti and Aïr and Ennedi contain species coming from the tropical regions of Africa and of these three areas, the percentage of tropical species found in the Ennedi is extremely high (74,5 %) and higher than Tibesti and Aïr and Tenere. Of those massifs, two are currently inscribed on the World Heritage List under criterion (ix): Tassili n'Ajjer in Algeria and Aïr and Ténéré in Niger.

The comparative analysis in the nomination in relation to criterion (ix) has been extended by a comprehensive review by UNEP-WCMC and IUCN. The Ennedi Massif is a unique ecosystem of the Sahara: an island of biodiversity in the vast Sahara desert, with the presence of Sahelian and subtropical species and relict species. The property is in the Sahara province of Udvardy, which is already represented on the World Heritage List with four sites, one of which inscribed under biodiversity criteria, namely Aïr and Ténéré Natural Reserves, in Niger. In addition to this, there are also eight sites on the Tentative List, including five biodiversity sites. The nominated property covers two terrestrial biomes: the Afrotropic Deserts and Xeric Shrublands and the Afrotropic Tropical and Subtropical Grasslands, Savannas, and Shrublands, which are already well represented on the World Heritage list with 5 and 20 existing World Heritage site, respectively.

The Ennedi Massif is situated in two ecoregions: the East Saharan montane xeric woodlands and the Sahelian Acacia savannah. The Eastern Saharan montane xeric woodlands is not currently represented on the World Heritage but there are also many Tentative List sites in these two ecoregions. The 'gueltas' are particularly important for biodiversity: thanks to the almost constant availability of water, they host a high percentage of relict flora and rare species; for instance, in the Maya gorge, 44% of the trees are relict species. Other examples include crocodiles in the Guelta d'Archei and the vegetation of the Maya guelta. The flora of the Guelta of Bachikélé is also important, notably with a population of *Rauwolfia caffra*, a tree that normally grows in tropical and equatorial Africa. The nominated property does not belong to any biodiversity hotspots, high biodiversity wilderness areas, priority ecoregions, endemic bird areas or centres of plant diversity.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

The nominated property is protected through a special decree (Decree 260/PR/PM/MCDT/2016) of 5 March 2016, which establishes the area as a "mixed protected site (cultural and natural)". The decree also establishes the buffer zone as noted in the supplementary information. This protection status is based on the Law 14-60 dated 2 November 1960 concerning the protection of monuments, natural sites and sites and monuments of pre-historical, archaeological, scientific, artistic or picturesque values, the protection of historical or ethnographical objects and the regulation of excavations.

The legal protection of the nominated site is somewhat weak in relation to the nature of the proposed listing, and is assessed as equivalent to the regime of protection of an IUCN category III protected area. This designation would seem appropriate to protect individual natural and cultural features which are attributed to criteria (iii) and (vii), but it seems less appropriate to provide adequate large-scale legal protection to an area of 24 000 km<sup>2</sup> nominated under criterion (ix), and which is *de facto* a multiple use area. The protection status as currently in place foresees no zonation or other differentiated protection regime.

Part of the nominated property was also designated as a wildlife reserve, the Fada-Archei Faunal Reserve (Reserve de faune Fada – Arche), created in 1963 (Decree 232-PR-EFLC-PNR), but the legal status of this reserve has now expired. This former Reserve has an area of 211 300 ha and covers part of the buffer zone and a small portion of the property. It was confirmed to the mission that the Reserve is not being managed and thus only has past status on paper.

The field mission was however informed that the Minister for Agriculture and the Environment signed an MOU with the NGO African Parks Network (APN) on 3 February 2015 to assess the feasibility of creating a

new protected area in the Ennedi mountains. The State Party should be encouraged to use this current process to create a new protected area in order to provide a more robust legal protection for the nominated property, prior to considering its possible inscription.

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

## 4.2 Boundaries

The initial nomination file indicates that the entire Ennedi Massif was included in the property given that the attributes justifying the criteria for inscription are dispersed throughout the mountain range. In light of the fact that the entire massif was originally included the nominated property, it was reasonable to assume that most areas where the values for criteria (vii) and (ix) could be found were within the nomination. However, the boundaries have been modified twice during the nomination process, with the most recent modification significantly reducing the area and thus effectively undermining the integrity of the nomination as was originally submitted.

The final revised nomination covers only the central and southern parts of the Ennedi mountain range, excluding the north of the massif which was originally included. During the evaluation mission it was noted that even the original nomination had excluded some important areas, and lacked an adequate buffer zone, and during the December ICOMOS Panel the State Party had presented an increased (not decreased) boundary, and a larger buffer zone as its proposal. That interim configuration was not available for evaluation by IUCN, but is also no longer proposed. The original submission and the final revised submission are included as maps 2 and 3 at the end of this report, to allow the Committee an easy means to compare them.

The revised boundary, which could not be considered during the field mission, clearly excludes a range of important attributes noted in the nomination. IUCN also notes that both cultural and natural attributes are now excluded from the nomination as revised, such as Niola Doa which was cited in the nomination as one of the most significant rock art sites – the implications of the change will be assessed by ICOMOS. The northern part of the Ennedi Massif borders the hyper arid Mournia depression which is an important transition zone between the desert environment and the massif and the region where the sharpest gradient in rainfall occurs (from hyper arid to semi-arid), and which is cited in the nomination as unique. The southern edge of the massif borders a much wetter area, which is sahelian rather than saharian. While there is very little data in the nomination on the geographical location of the attributes justifying criterion (ix), it seems logical that this northern area of rapid climatic transition is important, and its exclusion clearly impacts the justification of criterion (ix). In summary it is no longer possible to conclude that the nomination includes all necessary attributes that reflect

criteria (vii) or (ix), following the excision of the northern part of the Ennedi Massif.

Aside from the direct impacts on integrity that result from reducing the area, this very late change in the northern boundaries of the property is stated to be motivated by the fact that oil exploration/exploitation rights have been granted to companies across the whole of the northern part of the massif since 2012, which is directly in contradiction to what was said to the evaluation mission during its field visit.

The new proposal includes a partly enlarged buffer zone, which had been recommended by the evaluation mission, but this zone is still very narrow to the south of the nominated property, and does not provide a buffer to the entire nominated property, as the northern area, which is adjacent to the area where extractive exploration permits seem to have been delivered has no buffer zone.

It would appear that the interim proposal of increased boundaries, as had been presented to ICOMOS in December 2015, reflecting the whole of the massif and an adequate buffer zone, may have provided a solution that would have met integrity requirements, but this configuration has not been formally proposed for evaluation by the State Party.

In conclusion, the newly revised boundaries of the nominated property are not appropriate to the natural features and values that are the basis for its nomination under natural criteria, exclude key attributes of Outstanding Universal Value, and do not provide appropriate protection to the property from adjacent land uses.

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

## 4.3 Management

The nomination file states that the traditional management by the indigenous people has until now safeguarded the integrity of the proposed property. It states that these indigenous communities have lived in harmony with their environment for millennia and that they are the guarantors for the preservation of the site. However the nomination confirms that the traditional management is poorly documented as it is governed by oral traditions.

The nomination indicates that this traditional management should be complemented by additional professionalised management to be able to respond to the challenges facing the site, for example from extractive industries or anticipated impacts from climate change. However, such management is not yet in place.

The Ministry for Culture, Youth and Sports has planned to put in place a National Multidisciplinary Inter-ministerial Scientific Committee (Comité Scientifique National Interministériel et Pluridisciplinaire – CSNIP) should the nominated

property be inscribed on the World Heritage List which would be in charge of coordinating the management of the property. The goal is to also establish Local Organisation and Implementation Committees (Comités Locaux d'Organisation et d'Exécution), which would participate actively in the management and conservation of the site. A site manager and a deputy would also be appointed and would have direct responsibility for the management of the site and liaising between the CSNIP and local committees. The proposed management system, while probably sufficient for a property nominated under criterion (vii) only, is not adequate for a property nominated under criterion (ix), as no field staff, field resources or management structure are planned to ensure the necessary protection and management measures.

A feasibility study to establish a protected area in the Ennedi appears to be underway, conducted by APN; but it is still unclear how this would eventually be designed, and also how this proposal might interact with the proposed management structure of the nominated property. There is currently neither fully functioning management, nor budget and adequate management plan available for the nominated property. In summary there is much work to be done to address the strong need for a more robust management framework, although the proposed partnership with APN has good potential to offer solutions in this regard.

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

#### 4.4 Community

According to the original nomination c.40 000 nomadic or semi-nomadic pastoralist people live in the region of the property (including its buffer zone), following traditional lifestyles. Community representatives who met with the evaluation mission were aware of the nomination process and supportive of it, and indicated their pride in the fact that the nominated property is proposed for inscription on the World Heritage List. Support for the nomination was expressed by the representative of the different Chefs de Canton at the initial meeting in Fada. The management plan foresees that local communities will remain actively involved in the management of the site through the proposed local committees. It is also clearly specified in the nomination file and the management plan and was confirmed to the field mission that the existing tenure and land use rights of the local communities will not be affected by a potential inscription.

#### 4.5 Threats

The site is very isolated and remote, requiring several days of travel through a barren landscape to reach it, and has a low level of population using its natural resources. Human use is still limited and issues such as overgrazing are limited to a few areas. The nomination document mentions the following threats: pastoralism, agriculture, poaching, harvesting of wood

for firewood and construction, mining and oil exploration / exploitation and tourism.

Pastoralism is the basis of the local economy. Concentration of livestock around areas with permanent water access may result in a heavy localized grazing pressure. The grazing pressure at this stage does not seem to have reached a critical stage and even in the most heavily used areas, no desertification was observed by the field mission. The increasing pastoral pressure is however a clear potential threat in relation to criterion (ix) and it will need careful management in the future. Zoning to ensure that the most fragile/sensitive areas are protected from overgrazing should be established and the issue of increasing livestock numbers should also be clearly addressed with the pastoral communities.

Agriculture is not traditionally practiced in the property and the potential to develop it is limited due to the lack of water; the rural activities are currently limited to some small-scale gardens in areas like Fada, where permanent water is available. Nevertheless, agriculture could possibly be developed further in some oueds by accessing underground water supplies and there seem to be no measures in place to regulate or limit those activities. It is also of concern that the proposed budget of the management plan includes the introduction of drip irrigation in the property. Whilst the regulation stipulates that intensive agricultural use in particular by unlimited usage of water resources is not allowed in the property, this issue should be considered cautiously in the new management plan, in view of the potential impacts due to the limited water supplies to maintain the natural processes.

Wood is harvested by the local communities for cooking, charcoal production and construction. Firewood collection does not seem to currently present a significant threat, but could become an issue in the future as a result of increasing population and visitor numbers. The management plan foresees the introduction of solar energy and improved stoves and gas cooking for tourists; wood harvesting should also be clearly addressed and limited in the management plan.

Poaching has decimated much of the wildlife in the property and is reported to have led to the local extinction of several key species such as Oryx, Addax, Dama Gazelle, Ostrich and Lion. Some Cheetah (VU) are reportedly still present as well as Argali Sheep (NT) and Dorcas Gazelle (VU), in small numbers. The sharp decline in wildlife reportedly occurred past times when conflict has affected the property. The present situation is that there is still a viable population of some key species, but these continue to be threatened.

Large scale mining activities is forbidden in the property and there are no mining or oil exploration/exploitation permits overlapping with the property as designed after the boundaries modification; however, as noted above, the area that is permitted for oil exploration and was excised from the nomination in February 2016, north of the 17<sup>th</sup> Parallel,

contains significant attributes critical to the case for Outstanding Universal Value, and any future oil exploitation activities in the vicinity of the property and possibly inside the massif may have indirect effects on its protection.

Tourism is little developed in the area due to logistical challenges; visitor numbers are currently estimated between 200 to 600 people a year. Nevertheless, this sector of activities is expected to rise in the future. A specific section of the management plan is devoted to those activities, and will need to be fully implemented; this sector should be managed and developed sustainably in the future, in close association with the local communities and so that impacts on the values and integrity of the property are minimized.

Vandalism is a common problem in emblematic scenic sites and rock art sites, but overall the problem is very limited and seems well contained. The issue is recognized and local communities are being sensitized on this issue.

Due to the environmental conditions, decomposition of waste is very slow in a desert environment. Waste management is therefore an important issue in particular given the nomination of the property under criterion (vii). Littering can be a problem linked to tourists and local people but there is also an issue on the management of waste of the settlements in the property. Nevertheless, the problem of littering is remarkably limited compared to many other similar properties.

There is no road system in the property but multiple tracks all over. Off-road driving is common, impacting the sparse vegetation. While the number of vehicles is low, tracks can be found everywhere, impacting on the intactness of the landscape and on the fragile vegetation. There is therefore a need to set up a more rigorous track system and limit off-road driving, especially in the more densely inhabited and visited area around Guelta Archei.

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

## 5. ADDITIONAL COMMENTS

None.

## 6. APPLICATION OF CRITERIA

The **Ennedi Massif: natural and cultural landscape** has been nominated under natural criteria (vii) and (ix), as well as under cultural criteria (iii) which will be evaluated by ICOMOS.

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

The Ennedi Massif is one of the 6 major mountain massifs rising out of the Sahara Desert, which is the

largest hot desert and one of the most inhospitable regions in the world. The massif is composed of sandstone and is sitting on a granite Precambrian base. Over time, water and wind erosion sculpted the Ennedi plateau, interspersed with canyons and cliffs, creating a spectacular landscape of dramatic rock formations, including natural arches, pitons, mushroom rocks, labyrinths, pinnacles, chimney rocks, needles and other distinct structures. Many of these rock formations are outstanding on their own, but the exceptional number and density of these phenomena creates a truly unique landscape of high aesthetic quality and constantly changing vistas. However the nomination as conceived does not meet the integrity requirements in relation to this nomination and, as revised, appears to exclude key attributes in the northern part of the Ennedi Massif.

IUCN considers that there is potential for a revised and extended nomination of the Ennedi Massif to meet this criterion, but the property as nominated does not meet this criterion.

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

The plateau is cut by steep canyons and valleys, in which water can accumulate and vegetation can grow. These canyons play an important role in the ecosystem. In larger canyons, so called Gueltas are formed, some of which have permanent year round water. This permanent water is critical for the survival of fauna, flora and people.

The wetter conditions which prevail in the Ennedi mountains as a result of its unique orographic position also allowed species of plants and animals, which inhabited the wider region when climatic conditions were more favourable, to continue to survive in the mountains until today. In addition relict species also occur, mostly trees, which are survivors of these ancient times although they are not capable of reproducing. In the Ennedi gueltas and canyons, plants and animals can be found, which are far away from their normal distribution ranges in the sub-tropics and tropics. The Ennedi has therefore been called the Garden of Eden of the Sahara.

Probably the most striking example of a relict population is the small population of crocodiles, estimated at around 10 individuals, which can be found in the Guelta Archei. During the last glacial period when wetter conditions prevailed, the hydrological and river system of the Ennedi mountains was connected to other river systems to east and the west. These fluvial connections allowed crocodiles to move into the region. With the return of the drier conditions, these fluvial connections dried out and only a small population was able to survive in the Ennedi refugium, thanks to the presence of permanent water in the Guelta Archei.

The Ennedi Massif is therefore an outstanding example of a very specific relict ecosystem and refugium harbouring a population of fauna and flora which testifies of a major climatic change in the Sahara Desert. However the nomination as revised does not

include or protect the full range of these features, and the integrity requirements are therefore not met. The attributes which express this criterion are largely not mapped and documented, but given that the spectacular gradient from hyper-arid to semi-arid noted in the nomination is found in the north, this area clearly includes significant and distinctive attributes. Whilst not nominated in relation to criterion (x) it should also be noted that significant loss of wildlife populations is noted from the nominated property, which also is a factor in considering the application of criterion (ix) in relation to the functioning of the ecosystem.

IUCN considers that there is potential for a revised and extended nomination of the Ennedi Massif to meet this criterion, but the property as nominated does not meet this criterion.

## 7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopts the following draft decision, noting that this will be harmonised as appropriate with the recommendations of ICOMOS regarding their evaluation of this mixed site nomination under the cultural criterion and included in the working document WHC/16/40.COM/8B:

The World Heritage Committee,

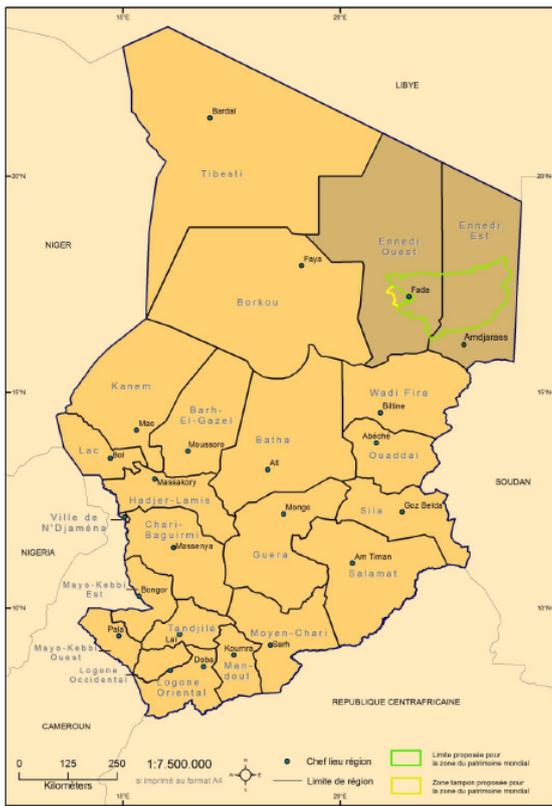
1. Having examined Documents WHC/16/40.COM/8B and WHC/16/40.COM/INF.8B2,

2. Defers the nomination of the **Ennedi Massif: natural and cultural landscape (Chad)** on the World Heritage List, noting the potential of a larger area, based on the extended version of the original nomination to meet criteria (vii) and (ix);

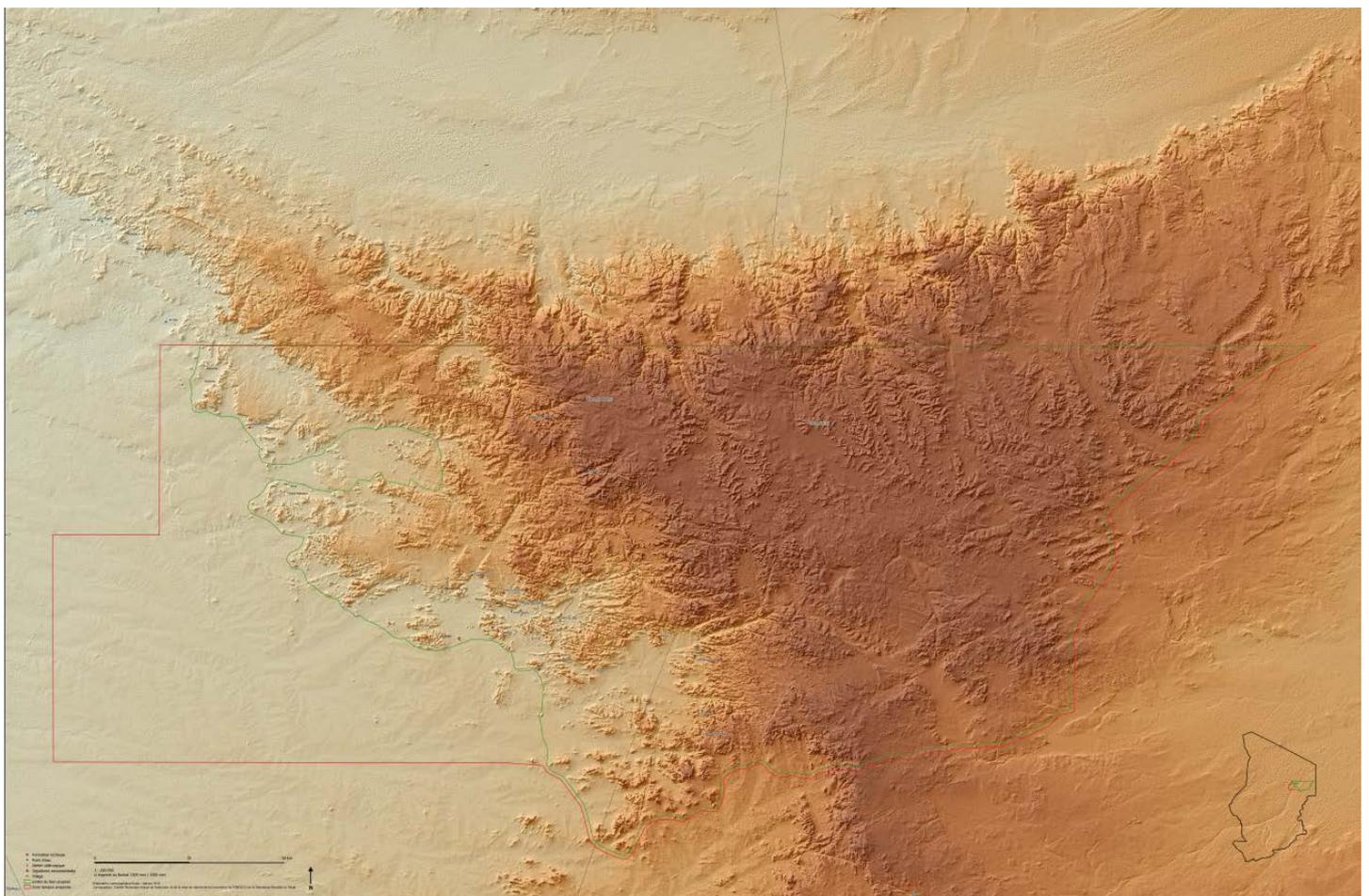
3. Recommends the State Party to present a revised nomination, corresponding to the extended boundaries of the original nomination and meeting the requirements of the Operational Guidelines, which:

- a) comprises a nominated property and buffer zone which ensure the protection of all the attributes which could justify an inscription under criteria (vii) and (ix), including the conditions of integrity;
- b) includes a detailed botanical inventory of the site, to identify all important refugia and areas for relict flora that may justify the application of criterion (ix);
- c) strengthens the legal protection status of the proposed property by the creation of a protected area with a regime of protection adequate to the values of the property and meeting the protection requirements of the Convention ;
- d) establishes a management plan for the whole property, meeting the international standards and which clearly:
  - i. spells out management operations to conserve the World Heritage values;
  - ii. includes a zonation which allows full protection of the key areas for biodiversity;
  - iii. details the measures foreseen to address the main potential threats;
  - iv. guarantees the full participation of the local communities in the management of the property; and
  - v. clarifies the institutional management regime of the property and provides a detailed staffing and budget consistent with the effective implementation of the required management.

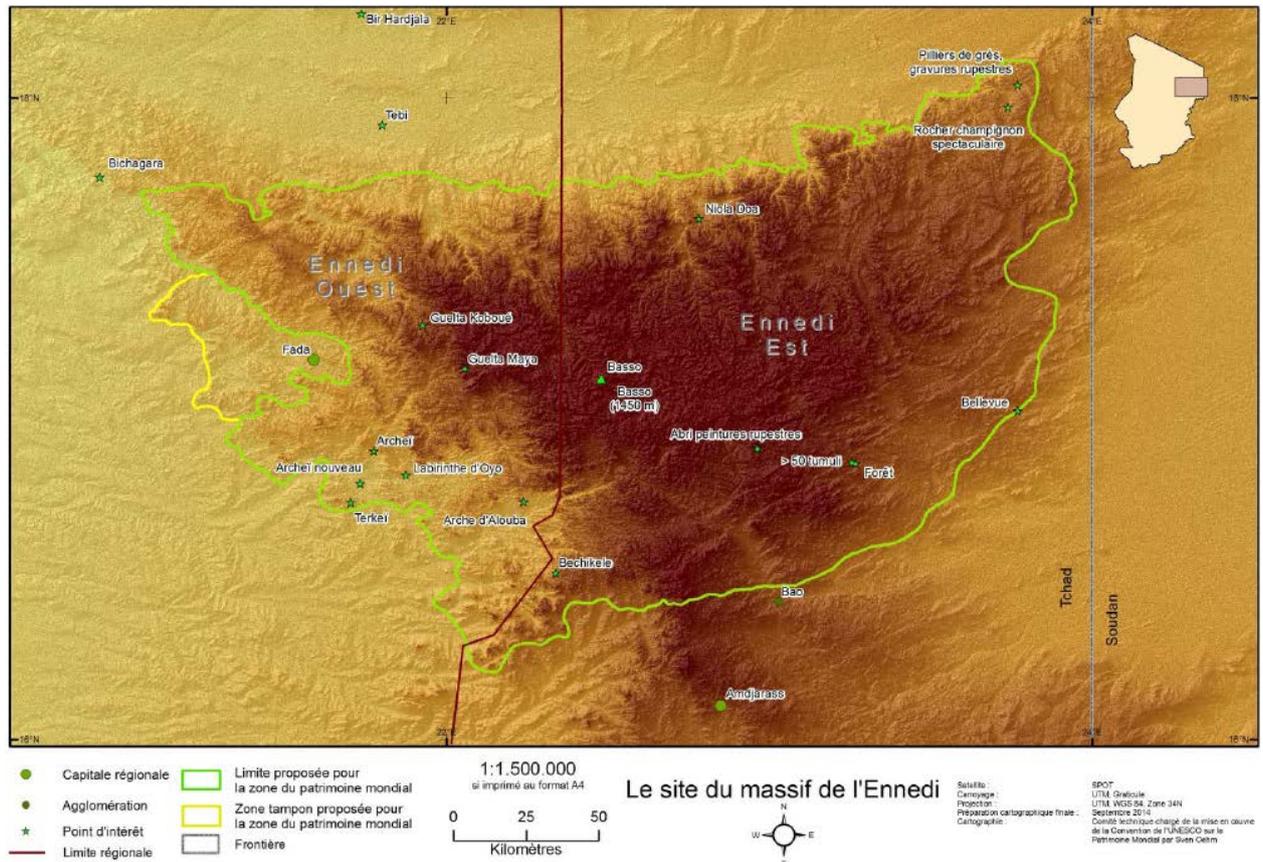
**Map 1:** Location of the nominated property in Chad



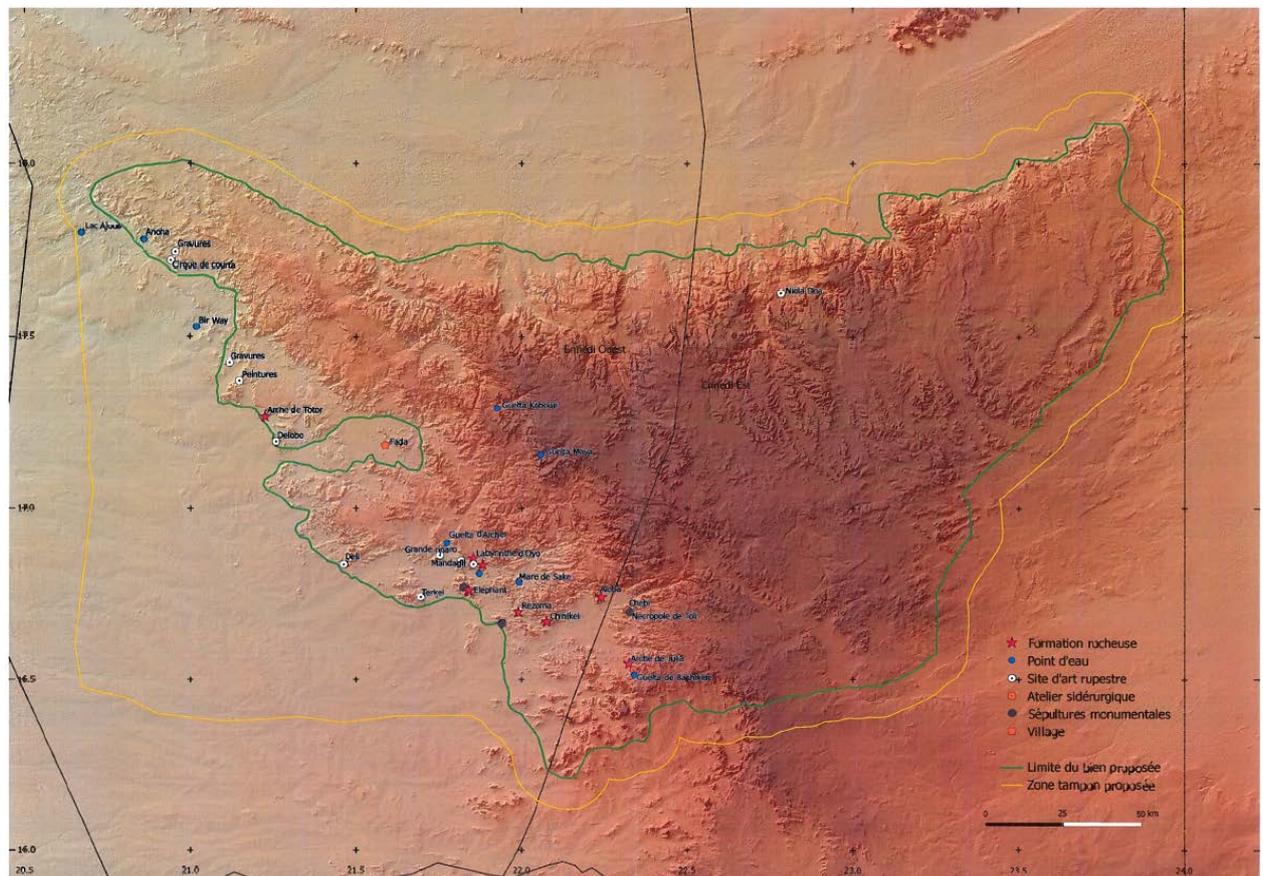
**Map 2:** Nominated property and buffer zone – final revised submission of 25 February 2016



**Map 3:** Nominated property and buffer zone – original submission



**Map 4:** Nominated property and buffer zone – submission to ICOMOS on 30 November 2016 and not evaluated by the IUCN World Heritage Panel





ARAB STATES

# THE AHWAR OF SOUTHERN IRAQ: REFUGE OF BIODIVERSITY AND THE RELICT LANDSCAPE OF THE MESOPOTAMIAN CITIES

IRAQ



Central Marshes - © IUCN Faisal Abu-Izzeddin



## WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

### THE AHWAR OF SOUTHERN IRAQ: REFUGE OF BIODIVERSITY AND THE RELICT LANDSCAPE OF THE MESOPOTAMIAN CITIES (IRAQ) – ID No. 1481

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

**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:** This nomination file was submitted in 2014 for evaluation at the 39<sup>th</sup> Session of the World Heritage Committee; however, due to logistical and security matters, the State party requested to postpone the evaluation until 2015, for discussion at the 40<sup>th</sup> Session of the World Heritage Committee. The evaluation mission was undertaken in 2015, although logistical considerations prevented this being organized as a joint mission. IUCN and ICOMOS have met jointly with the State Party in face-to-face and skype meetings on at least 7 occasions to discuss the nomination during the evaluation process to date. In addition IUCN provided upstream advice on this nomination in a documented process that is referred to in the references below.

#### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 16 March 2015

**b) Additional information officially requested from and provided by the State Party:** Following the IUCN World Heritage Panel a joint progress report was made by IUCN and ICOMOS, and sent to the State Party on 27 January 2016. Further information was sought by IUCN on the minimum water flows required to maintain the wetland components of the nominated property, the degree to which these flows are being met, and the degree of threat to these essential water supplies. In addition IUCN requested a fully up-to-date statement on the biodiversity values of the nominated property, including threatened plants and species, and on a range of matters concerning the cultural components of the nomination, and the justification for a serial approach. IUCN and ICOMOS held a conference call with the State Party on 11 February 2016 to further discuss the joint request and interim report. The State Party responded with further information on 25 and 29 February 2016.

**c) Additional literature consulted:** Various sources, including records of the Ramsar Convention, and Garstecki, T. (2012). *Development of a Management Planning Framework for Ecosystem Management and Biodiversity Conservation in the Iraqi Marshlands*. UNEP / IUCN. Garstecki, T. and Amr. Z. (2012). *Biodiversity and Ecosystem Management in the Iraqi Marshlands – Screening Study on Potential World Heritage Nomination*. UNEP/Ministry of Environment/UNESCO. Jasim, I. (2013). *Environmental Laws in Iraq*. (Arabic). Ministry of Environment, Republic of Iraq. Republic of Iraq. Ministry of Environment. (2013). *The National Environmental Strategy and Action Plan for Iraq (2013 - 2017)*. Republic of Iraq. Ministry of Environment. (2014). *“The Ahwar” Marshlands of Southern Iraq. The Consolidated Management Plan for the Protected*

*Areas of the Huwaizah Marshes, the Central Marshes, East Hammar Marshes and the West Hammar Marshes*. Thesiger, W. (1964). *The Marsh Arabs*. Penguin Books. Fawzi, N. A.-M., K.P. Goodwin, B.A. Mahdi, and M.L. Stevens (2016) *Effects of Mesopotamian Marsh (Iraq) dessication on the cultural knowledge and livelihood of Marsh women*. *Ecosystem Health and Sustainability*. 2(3). Chatelard, G. and T. Abulhawa (2015) *The World Heritage Nomination of the Ahwar of Southern Iraq*. Report on upstream process published by Arab Regional Centre for World Heritage, Manama. Hoffman, F. T., Langendoen and T. Mundkur (2013) *Comparative analysis on the biological diversity and institutional management of the Marshlands of Southern Iraq*. Wetlands International. Magin, C. and S. Chape (2004) *Review of the World Heritage Network: Biogeography, Habitats and Biodiversity*. IUCN, Gland, Switzerland and UNEP-WCMC, Cambridge, UK.

**d) Consultations:** 9 desk reviews received. The mission also met with the Governor, 1<sup>st</sup> Deputy and 2<sup>nd</sup> Deputy Governor of Basra; the Governor and 1<sup>st</sup> Deputy Governor of Thi Qar; and representatives from the Ministry of Health and Environment and from the Ministry of Water Resources (MOWR) in three Governorates. Further consultation took place with representatives of the Basra and Haritha Municipalities; the National Guard of Basra; NGOs; the Ahwar task force; the Ramsar Focal Point in MOWR; and with many local residents and stakeholders.

**e) Field Visit:** Faisal Abu-Izzeddin (IUCN), 15-22 November 2015, and Assaad Seif (ICOMOS), 6-13 October 2015

**f) Date of IUCN approval of this report:** April 2016

## 2. SUMMARY OF NATURAL VALUES

The nominated property lies in Southern Iraq, within the four governorates of Maysan, Al Basrah, Dhi Qar (which include the wetland areas of the nomination), and Al Muthanna. The nomination is of a serial property, and nominated under both cultural criteria (iii) and (v) and natural criteria (ix) and (x). It comprises three archaeological “cultural components” (the small but internationally significant archaeological sites of the Sumerian Cities of Uruk, Ur, and Tell Eridu (respectively 541 ha, 71 ha and 33 ha in size), and four larger areas termed “natural components” in the nomination, which consist of four freshwater, brackish and saltwater marshland areas in Southeastern Iraq. These four latter components are the Huwaizah Marshes (48,131 ha and included within a Ramsar Wetland of international importance), Central Marshes (62,435 ha), East Hammar (20,342 ha) and West Hammar (79,991 ha) Marshes. The total area of the property is 211,544 hectares, with an additional 209,000 hectares in buffer zones, which are defined around every component, with the exception of Huwaizah where there is no buffer zone at the national border with Iran.

The Ahwar of Southern Iraq (also known as the Iraqi Marshlands) is unique as one of the world’s largest inland delta systems in an extremely hot and arid environment. The marshlands are a highly dynamic system, characterized by short and long-term ecological succession processes. Short term ecological succession results from the fact that the marshlands receive little or no precipitation and are virtually entirely dependent on a seasonal influx of water from the Tigris and Euphrates rivers. Longer term succession has resulted from a range of factors including Earth tectonics, changes in sea level, riverine hydrology, mineral deposition and changes in climate dating back to the mid-Holocene 6,000-7,000 years ago. These longer term processes have resulted in the shifting of the entire Ahwar system from its previous location near the cultural components of the nominated property, to its current location to the East. Because these succession processes were fundamental in shaping the Ahwar of Southern Iraq over several thousand years, the marshlands have a high degree of resilience, and this has made it possible to begin re-flooding and restoring the marshlands ecosystem since 2003, after the marshlands had been almost completely drained in preceding decades. The nomination notes that current plans have the objective of ultimately re-flooding a larger area totalling 556,000 ha, corresponding to about 75% of the original extent of the marshlands in 1973.

The Ahwar is an area of high species diversity relative to the young age of the ecosystem, with a number of endemic and restricted range species and numerous populations of threatened species, especially birds. These include four mammals (the endemic Bunn’s Short-tailed Bandicoot Rat (EN) and a subspecies of the Smooth-coated Otter (VU), in addition to the restricted range species of Mesopotamian Gerbil (LC) and Euphrates Jerboa (NT)), five birds (including the endemic Basra Reed Warbler (EN) and Iraq Babbler

(LC), in addition to the three restricted range subspecies of the Little Grebe (LC), Black Francolin (LC) and Hooded Crow (LC)) and six restricted-range fish species: Pike Barbel (*Luciobarbus esocinus*-VU), Gattan (*Luciobarbus xanthopterus*-VU), Leopard Barbel (*Luciobarbus subquincunciatus*-CR), Smallmouth lotak (*Cyprinion kais*-LC), Mesopotamian catfish (*Silurus triostegus*-LC) and Binni (*Mesopotamichthys sharpeyi*-VU). In addition, the Ahwar provide habitat for three relict populations of three bird species (the African Darter (LC), the Sacred Ibis (LC), and the Goliath Heron (LC)) that are thousands of kilometers away from their core global populations in Africa.

Finally, the marshlands are also globally important for seasonal bird migrations as well as for fish (many of which are diadromous meaning they migrate between salt and fresh waters) and crustaceans coming from the Arabian Gulf. As the only large-scale wetland system within thousands of kilometers along two bird migration routes, the marshlands have been recognized as one of the largest West Eurasian-Caspian-Nile staging points and wintering grounds for ducks as well as a major stopover point for shorebirds flying along the West Asian-East African flyway. Populations of at least 16 waterbird species appear to exceed 1% of the entire flyway population.

With regard to criterion (x), there is a range of additional information needed to better understand the biodiversity values of the nominated property. The nomination dossier lists 38 mammal species in the marshlands but notes this estimate relies on historical records rather than recent surveys. Confirming the presence of the mammal species in the components of the nominated property would be important. As noted above, more information would be needed on the minimum water flows necessary to sustain the biodiversity values of the nominated property. A more complete understanding of the tolerance limits for key plants and vegetation would also be useful as conditions in the marsh are still changing (water levels, salinity, nutrient levels, temperature etc.). This is essential information as aquatic and semi-aquatic plants are the structural and functional basis of the marsh community and are also crucial for traditional livelihoods. More data on the overall plant diversity in the Marshes is needed in particular the occurrence and status of endemic and globally threatened plants, as would further data on invertebrates. Little additional information is provided in the supplementary information on this aspect.

## 3. COMPARISONS WITH OTHER AREAS

The nomination has benefited from significant upstream support in relation to its nature conservation values, and the potential to meet the biodiversity criteria is documented in an IUCN commissioned study, undertaken by Garstecki and Amr in 2011. This study concludes that the area has potential to meet both biodiversity criteria, following an extensive analysis carried out in the broad methodology of the

World Heritage upstream process (although the study predates any formal adoption of the upstream process).

The nomination itself, based partly on this work and based on an extensive study by Wetlands International, undertakes a well-prepared comparative analysis of only the four “natural components” in relation to natural criteria. This analysis follows a clear methodology, initially screening to select 16 comparable sites, and then making detailed analysis of 7 of these. It concludes that in relation to criterion (ix) the nature of the wetland system in its arid setting, the endemism, the support for migratory species, and the ecological resilience demonstrated provide the basis for meeting this criterion. It also concludes that the high number of globally threatened and endemic animal taxa and the exceptional irreplaceability of the property for biodiversity conservation justify criterion (x).

In addition to this analysis IUCN and UNEP-WCMC undertook an extensive comparative analysis considering a wider range of sites than the comparison in the nomination. In relation to criterion (ix) this confirms that the nominated property represents ecosystems which are not yet well represented on the World Heritage list (Anatolian-Iranian Desert province; Flooded Grasslands and Savannas biome in the Palaearctic realm; Arabian Desert and East Sahero-Arabian xeric shrublands and Tigris-Euphrates alluvial salt marsh ecoregions; and Mesopotamian Delta and Marshes freshwater priority ecoregion).

In relation to criterion (x), the nominated property constitutes an important freshwater ecosystem situated within an arid environment. A low number of plant species has been inventoried within the nominated property compared to existing World Heritage sites, but it hosts a relatively rich fauna and is particularly important for bird species. It is indeed part of several global bird migration routes and overlaps with three Important Bird Areas. A high number of endemic and globally threatened animal species, and in particular globally threatened bird and mammal species, are found within the nominated property. The Mesopotamian Delta and Marshes freshwater priority ecoregion has also been mentioned as not represented on the World Heritage list in some past IUCN gap studies.

It should be noted however that the nomination’s focus on the natural criteria only concerns four of the seven component parts of the series, and no comparative analysis has been undertaken in relation to the cultural components. Given their small size, it is clear that none of those components contain significant nature conservation values, and certainly no globally significant biodiversity is conserved by those components as currently designated. Whilst an argument could be made that these areas show the deep history of the evolution of the natural evolution of the marshes, this element is not emphasised in the nomination (which terms them consistently cultural components) and they do not include landscape-scale areas that would be required to demonstrate how the

marshes have functioned in the past as an ecosystem. In the supplementary information the State Party provides a very brief analysis on the species found in the areas around the three archaeological components, with numbers of plants, mammals and birds cited, but no details of conservation significance. The configuration of this nomination as a proposed mixed site is further discussed in section 5 below.

Based on these extensive analyses, IUCN concludes that the Iraqi Marshlands has the potential to meet criteria (ix) and (x), but that at present the nomination does not make a convincing case to apply these criteria in relation to the series as a whole.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

The nomination lists a range of laws, bylaws, regulations and strategies, in effect and being planned, that are of direct relevance for the Ahwar. These include general laws that provide for overall regulation of environmental matters. However, only two of the natural components currently have protected area status, and as noted above the cultural components as nominated are not conceived to have a nature conservation function. The Central Marsh has been designated as a National Park and the Huwaizah Marsh is listed as a Ramsar site, however East Hammar and West Hammar are currently not officially designated. The nomination dossier states that designations are expected for all components in 2014, but these designations do not yet appear to have been completed at the time of the evaluation. In addition, the nomination notes that the buffer zones of several of the components could be subject to oil extraction activities, which might risk inconsistency with the protection of the nominated property. It would thus appear that the role of the buffer zones needs to be better defined and regulated.

Stakeholders freely admit that most of these laws are not being implemented at the present time. Part of the stated problem is that the laws are written in a language the stakeholders do not always understand, and thus in addition to establishing an adequate legal regime, it is also necessary to take steps to communicate the legal system more effectively.

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

### 4.2 Boundaries

The size of the nominated property proposed for World Heritage nomination is more than 210,000 ha which is comprised in the main by the wetland components. According to the dossier, and confirmed by the field evaluation, the design of the boundaries of the four natural components of the nominated property was based on inclusion of the natural values and attributes associated with its global importance; providing optimal habitats for all key species and their

conservation; covering areas targeted by the national environmental and nature conservation strategies; and avoiding overlap with existing and/or planned pressures such as oil prospecting. The buffer zone was based on extensive field assessments conducted with the help of international initiatives since 2004. The buffer zones are adequate and were designed as a protective belt around the main area of the nominated property in order to minimize harmful developments such as oil exploration and urban development. Some villages are located within these buffer zones but they are small and do not appear to pose a threat to the nominated sites themselves.

A further boundary related issue is to maintain ecological connectivity through effective ecological corridors between the component areas and their buffer zones. The four natural components of the nominated property represent four stand-alone hydrological systems, designated independently from each other. However, these areas are ecologically interdependent, and the Iraqi Ministry of Health and Environment and its partners indicated that they wish to establish a set of ecological corridors to ensure ecological connectivity of the serial property. This work has not yet been undertaken.

IUCN has considered jointly with ICOMOS the position regarding the so-called cultural components, and takes note that ICOMOS considers that these areas should be enlarged, as well as potentially made the subject of a separate nomination. IUCN notes that as currently proposed these components neither address the natural criteria, nor are sufficiently large to meet integrity requirements in relation to consideration of the natural criteria. IUCN considers that if these areas were to be enlarged, it would be important to consider the options to define boundaries that might better respond to the overall application of natural criteria to a mixed serial site – this exercise could both consider the opportunity for wetland restoration in any of the recently drained areas, and also the way in which the ancient marshland landscape could be better represented in the nomination. Such an approach could also then allow the ancient city components to demonstrate more clearly the ancient evolution of the rivers and the extent of the related marshlands.

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

### 4.3 Management

As part of the nomination procedure an overall management plan for the nominated property is being developed (including management plans for each of the four components of the Marshlands of Southern Iraq), and the latest versions of these documents have been provided. In particular there is an active and ongoing process that is being coordinated by UNEP, and involving over a number of years the IUCN Regional Office for West Asia, who has been also providing technical assistance and coordination regarding the development of the management plan for the nominated property, as has the Arab Regional

Centre for World Heritage. Despite all of these efforts more work is needed to detail the plan such that it effectively drives management of the site.

The management plan for the natural components provides a coherent and useful list of planning objectives. However, the plan restates large sections of the nomination and provides little information on implementation. In particular, essential information relating to staffing levels, budgets, and timelines for implementation to achieve the planning objectives is not provided. IUCN considers that a more detailed management plan is necessary and that the current management plan needs to be strengthened substantially.

In addition, the field mission noted a conspicuous absence of site level management capacity throughout the nominated property, except with respect to the Huwaizah Marshes, where border guards are present and provide some monitoring capacity. While the Marshlands have benefited from a variety of protected area planning, monitoring and water planning, there seems to be little current activity at site level. Management capacity to implement any plan is not sufficient, and the current plan does little to address the roles and activities of the site management teams that will be the key to the success or failure of the management structure of this potential World Heritage site. The recruitment and management of increased human resources, in particular the site manager, site rangers and site guides, are paramount. At the present time the main actors have little prior experience in protected area management and the documented management system and plans are not understandable to most stakeholders, and at the time of preparation of the report had not been translated into Arabic. A simplified and illustrated management plan in Arabic has been suggested as a key need by a number of stakeholders during the evaluation mission.

A further central issue is that changes in ministerial responsibility are evident in Iraq, and given the complexity of the plans for the mixed site there appears to both be an issue of lack of clarity of overall responsibility for the site, and changes in national focal points that has made the continuity of implementation of the plan challenging. Given that it is apparent that there needs to be overall reflection on the nature of the mixed site proposed, it will also be important to more clearly decide the eventual focus of the nomination, in order to complete management planning, and appropriate governance and implementation arrangements that are fit for purpose. Financial resources do not seem to be an immediate constraint to the nomination, but additional technical resources need to be secured, and budgets revised accordingly.

The State Party's stated commitment to the nominated property and to strengthening its on-ground management have been reinforced in all of the different meetings held and basic plans are documented in the supplementary information. One positive area is that there are clearly a range of organizations engaged, including IUCN, ICOMOS and UNESCO, UNEP and the Arab Regional Centre for

World Heritage. These partners have both some available resources to support the completion of the management plan, and good levels of technical capacity to be able to provide further support to the State Party, provided there is clarity on the eventual configuration of the nomination. In future it will be important to ensure good coordination among the various technical partners to the nomination.

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

#### 4.4 Community

The nomination includes a summary of the socio-economic setting of the Ahwar, and the long history of cultural use is noted, in particular by the long-term inhabitants of the Ahwar, the Marsh Arabs or Ma'adan. The nomination does not provide a specific number for the community living in the nominated property, but estimates this to be c.5% of the total of 350,000 people living in the Ahwar as a whole (which would amount to 17,000 people). The nomination also recalls both the perceived social trends, and the level of disadvantage and poverty that exists within this community (for instance noting the highest levels of illiteracy in Iraq particularly amongst women). It also acknowledges the brutal forcing out of the population associated with the deliberate draining of the marshes – reported in the literature as resulting in a reduction from a population of 500,000 in the 1950s, to c.20,000 by 2003. Relevant research including past anthropological records of the traditional use exists and is also documenting the changes that have resulted from the drainage, such as the loss of traditional knowledge held by women regarding marshland management. The restoration of the wetlands is therefore both an activity relevant to nature conservation, but also to the maintenance of traditional knowledge and the restoration of rights.

The specific descriptions of the wetland components imply very few permanent settlements in the Central Marshes (near Abu Zirq, and in Ach Chibayish), and in East Hammar, and note that there are a number of settlements in the buffer zones. In addition the nomination identifies that local uses of the wetlands continue, some regarded as sustainable and others creating challenges, as is discussed further below. The nomination makes little reference to this aspect in relation to the cultural criteria, and IUCN considers it important to look further into the values of the wetlands as a cultural landscape, and looks forward to ICOMOS review of those aspects of the nomination.

In the Ahwar decision-making processes, co-management and stakeholder involvement are still at an early stage. The governance of the wetland through the co-management by the three Governorates of Basra, Thi Qar and Maysan appears the strongest element of management system. Stakeholder consultation has been undertaken in the preparation of the nomination, and regarding the management plan, and more such efforts are planned. Local communities met by the evaluation mission appear to be aware of and supportive of the nomination and traditional use

and local/tribal customs appears to be respected and is continuing in the nominated area, but as noted above is challenged in relation to the continuity of cultural practices of men and women. However, the nomination also explicitly states that customary land management regimes have not been recognized by government authorities in any official way and that the government reserves the right to change the land tenure without acquiring permission from the local population. The lack of formal recognition of customary rights creates a potential risk of significant conflict over traditional uses in the future. IUCN considers that additional measures should be taken to recognize customary rights, support traditional ecological knowledge, and ensure effective community engagement as a key component of management, in revising the nomination.

#### 4.5 Threats

The nominated property appears to be subject to a number of significant threats, the most notable of which is that water flows fluctuate significantly and the continued adequacy of flows in the future are uncertain. Water supply issues dominated each and every meeting held during the evaluation mission. A shared concern is the need to allocate more water for the Ahwar region from the upstream transboundary countries who have built dams on the Tigris and Euphrates rivers. The lack of sufficient inflow of water is seen as the major threat in the Ahwar and is beyond the control of local authorities and need national and international action to guarantee Iraq the minimum water requirements of the marshes. Stakeholders attribute the historical periods of water shortage to the loss of water due to offtake in Iraq, and the activities of upstream countries (Turkey, Syria and Iran) who are also using large quantities of water (dams and diversions) from both the Tigris and Euphrates rivers, and plan to increase such use. A mission by the Ramsar Convention to the nominated property in February 2014 noted that one of the projects with the greatest expected impact is the Ilisu Dam in Turkey which forms part of the Southeastern Anatolian Project. The dam as planned would create an 11 billion m<sup>3</sup> reservoir with a surface area of 31 km<sup>2</sup>, and will generate some 2% of Turkey's electricity supply. But it could halve the amount of water Iraq receives from the Tigris River, affecting some 670,000 hectares of arable land and in the worst case leaving the Mesopotamian Marshes dry. IUCN also notes the construction of a weir along the Iraq-Iranian border, which bisects the Huwaizah Marsh Ramsar Site, restricting water flow from Iran to the Huwaizah component. Climate change and drought in the region further exacerbate the water supply problem. In addition to water supply, there are also substantial concerns related to water quality as a result of agricultural run-off and domestic waste, and a potential threat from oil spills and pollution from oil operations nearby.

The supplementary information provided by the State Party notes that 3.3 billion m<sup>3</sup> of water has been allocated to the marshlands, which is deemed sufficient to flood the 556,000 ha of marshlands

targeted for restoration. This water allocation would presumably be more than sufficient to flood the 211,544 ha of the nominated property. However, it is also clear that water flows fluctuate significantly on an annual basis. Only 2.1 billion m<sup>3</sup> reached the marshlands in 2015 and the supplementary information noted there were concerns over the water quality in the marshlands that year. IUCN considers that more data is needed to indicate what the minimum water flows are required to sustain the Ahwar and its succession processes and to provide assurances that this minimum water flow can be generated and sustained into the foreseeable future.

The nomination dossier indicates that there will be no oil development in the property but that there may be ongoing and/or planned oil extraction in the buffer zones of several components. Further clarification will be needed on this point as oil extraction activities in the buffer zone could potentially adversely impact on the nominated property.

Habitat loss from agricultural expansion and unsustainable reed gathering is also noted as impacting the marshlands, and overfishing and hunting are also significant in some parts of the nominated property. Local use, such as fishing and game hunting which occur at varying intensities and localities, is noted in the nomination as posing a potential threat to one or more of the wetland components. Fishing in the marshes has used traditional techniques, although the nomination notes that the famous spear fishing (faleh) which started being used some 3,000-4,000 years ago is little practiced. Game bird hunting is regarded in the nomination as a more serious challenge to biodiversity, especially during migration seasons. The nomination also notes that reed harvesting requires management due to the impacts on birdlife, such as the Basra Reed Warbler.

Tourism is not considered a current threat to the Ahwar, however there is undoubted potential for future tourism growth. It is not fully clear how this will be managed, and what staff, infrastructure and facilities will be made available, and whether the local inhabitants will become the major beneficiaries of such tourism.

These different factors indicate the importance of continued work to define and then implement a strengthened management system for the nominated property, in a way that considers traditional use and also the dependency of communities on the nominated property. In this regard the nomination contains a useful summary of the ecosystem services provided by the Ahwar, although not differentiating between the nominated property, the buffer zones and the wider area.

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

## 5. ADDITIONAL COMMENTS

### 5.1 Justification for Serial Approach

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

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

The separate natural components of the Ahwar serial nomination were once a single functional unit that witnessed a drastic reduction of its water supply over a period of several decades. The key factor justifying the serial approach is that the area is now fragmented, and a serial approach allows the best opportunity to protect the most significant remaining areas of wetland whilst addressing issues of fluctuating water quality and quantity, controlling illegal hunting and fishing, managing the harvesting of vegetation cover, and monitoring oil extraction.

The wetland components of the nominated property are relatively large protected areas (albeit at different stages of formal protection). Each of the natural components has its own character and specific biodiversity. However, the four together cover all the natural habitats and on-going ecological and biological processes that characterize this particular "wetland island in a vast ocean of desert."

All components within the series do not, however, collectively respond to the natural criteria, since the "cultural components" are very small and do not conserve significant biodiversity. Thus a revised approach to the series as a whole needs to be considered, taking into account the evaluations of IUCN and ICOMOS, and the need for further work on the nomination.

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

The natural components are functionally linked. As part of their plan to reclaim the marshes, the Iraqi authorities selected four non-contiguous components of the Ahwar and their buffer zones - and plans are underway for ecological corridors that link the key habitats. Key taxa of birds and fish continue to move freely through the air and water connecting the four wetland components of the nominated property. The marsh systems are also hydrologically linked. The functional linkage between the natural components and cultural components is however not clear, and potentially weak in the nomination.

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

There is an overall management framework being developed in the form of the Consolidated Management Plan for the Ahwar and its component parts, however it cannot be called 'effective' until it has been completed and moved into implementation. As noted above the plan needs to be more operational, and be easier to understand and more effective in responding to the local stakeholders.

## 5.2 Mixed site configuration

IUCN considers that the interaction of cultural and natural values provides the Ahwar nomination with an important part of its potential Outstanding Universal Value. The “cradle of civilization” as we know it today began in wetlands surrounded by desert. The size of the wetlands fluctuated with the rise and fall of the water level, and the major ancient cities that flourished on the periphery of the marshes responded to those changes. Thus the wetlands and their interaction with people have been a continuous fact of this landscape, but the relationships have changed throughout history, and are clearly impacted by the most recent drainage programme up to the early 2000s, which had disastrous impacts on both people and nature. The nomination further notes that the ecosystem services of the wetlands of the property include unique cultural services that are both tangible and intangible parts of the heritage of Iraq.

The nomination, whilst emphasizing the narrative of a mixed site, has approached the consideration of a mixed site in a way that is problematic, in separating “natural components” from “cultural components”, and resulting in what is, in effect, two separate nominations – one related to (an archaeological) cultural value, and the other to a modern nature conservation value. This approach results in problems in reconciling the nomination with the Convention’s Operational Guidelines – since for a mixed property there should be a basis to see that the series as a whole corresponds to both the natural and cultural criteria. The absence of consideration of how the ancient cities relate to the illustration of natural processes is evident in the justifications offered in the nomination, and in their constrained boundaries, whilst the so-called natural components do not give much consideration to the traditional use values of these components, nor the limited archaeological remains that lie within the wetland area. In reviewing how to proceed with the nomination, IUCN is of the view that the option to revise and represent a mixed nomination is worth further exploration, to try to rectify the problems in the way the nomination was conceived. Pursuing two separate nominations, which IUCN understands is favoured by ICOMOS, might be worth further exploration but IUCN considers that it would be better to maintain that as an option in the event that a revised mixed site proposal proves to not be viable.

Finally IUCN notes that in this instance it is problematic that ICOMOS was not able to be engaged directly throughout in the upstream process that considered the options for the nomination from the outset. IUCN considers that as an operational matter, any intervention on the upstream process related to potential mixed nominations by a State Party, should seek to ensure the direct involvement of both IUCN and ICOMOS as a minimum requirement to ensure effective and early advice.

## 6. APPLICATION OF CRITERIA

**The Ahwar of Southern Iraq: refuge of biodiversity and the relict landscape of the Mesopotamian Cities** has been nominated under natural criteria (ix) and (x), as well as under cultural criteria (iii) and (v) which will be evaluated by ICOMOS.

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

The Ahwar of Southern Iraq demonstrates internationally significant ecological succession processes in one of the most arid inland deltas in the world, and is notable for its high degree of speciation in a relatively young ecosystem, and for its habitats which sustain bird migration. It is one of the largest West Eurasian-Caspian-Nile staging points and wintering grounds for ducks as well as a major stopover point for shorebirds flying along the West Asian-East African flyway. It is also significant for the migration of fish and shrimp species from the Arabian Gulf to the marshlands: at least 20 of the 44 fish species of the Ahwar are diadromous (migratory between salt and fresh waters) species from the Arabian Gulf, most of which migrate to the West and East Hammar Marshes. These values are represented in the four wetland components of the nominated property, but no contribution is made to them from the three Sumerian cities, and these cultural components are not configured to contribute to either the modern nature conservation values of the area, nor to represent the historical ecological evolution of the marshes. There are a range of significant integrity concerns, and additional information would be critically important to indicate the minimum water flow required to maintain succession in each of the marshes in the nominated property. Further evidence is also needed to demonstrate that effective management of the nominated property is in place.

IUCN considers that the nominated property has potential to meet this criterion, but that a reflection on the mixed site approach and boundaries is required, together with further work to address integrity, protection and management concerns.

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

The Ahwar is an area of high species diversity relative to the young age of the ecosystem, with a number of endemic and restricted range species and numerous populations of threatened species, especially birds. These include four mammals (the endemic Bunn’s Short-tailed Bandicoot Rat and a subspecies of the Smooth-coated Otter, in addition to the restricted range species of Mesopotamian Gerbil and Euphrates Jerboa), five birds (including the endemic Basra Reed Warbler and Iraq Babbler, in addition to the three restricted range subspecies of the Little Grebe, Black Francolin and Hooded Crow) and six restricted-range fish species: *Luciobarbus esocinus*, *Luciobarbus xanthopterus*, *Luciobarbus subquincunciatus*, *Cyprinion kais*, *Silurus triostegus* and *Mesopotamichthys sharpeyi*. In addition, the Ahwar provide habitat for three relict populations of three bird species (the African Darter, the Sacred Ibis, and the Goliath Heron) that are thousands of kilometers away

from their core global populations in Africa. The marshlands function as a stopover on the West Asian-East African flyway and protect internationally significant numbers of at least sixteen waterbird species. The four natural components represent the most significant areas of the wider Ahwar ecosystem to protect these values, but the cultural components, as conceived, do not provide any significant contribution to the nomination in meeting this criterion, although further work is required to fully document the biodiversity of these components and their surroundings, and to address connectivity between the components.

IUCN considers that the nominated property has potential to meet this criterion, but that a reflection on the mixed site approach and boundaries is required, together with further work to address integrity, protection and management concerns.

## 7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopts the following draft decision, noting that this will be harmonised as appropriate with the recommendations of ICOMOS regarding their evaluation of this mixed site nomination under the cultural criteria and included in the working document WHC/16/40.COM/8B:

The World Heritage Committee,

1. Having examined WHC/16/40.COM/8B and WHC/16/40.COM/INF.8B2;

2. Defers the nomination of **The Ahwar of Southern Iraq: refuge of biodiversity and the relict landscape of the Mesopotamian Cities (Iraq)**, taking note that the region has biodiversity values that are potentially of global significance, in order to allow the State Party, with the support of IUCN and ICOMOS if requested, to:

- a) Reconsider the options for the nomination as a mixed property, and how a significantly revised nominated property as a whole could be reconsidered to respond to both natural and cultural criteria as they apply to all of the selected components, taking into account the evaluation reports of IUCN and ICOMOS;
- b) Conduct further studies regarding minimum water flows needed to sustain the biodiversity and ecological processes for which the site is nominated, and demonstrate that these water flows will be provided;

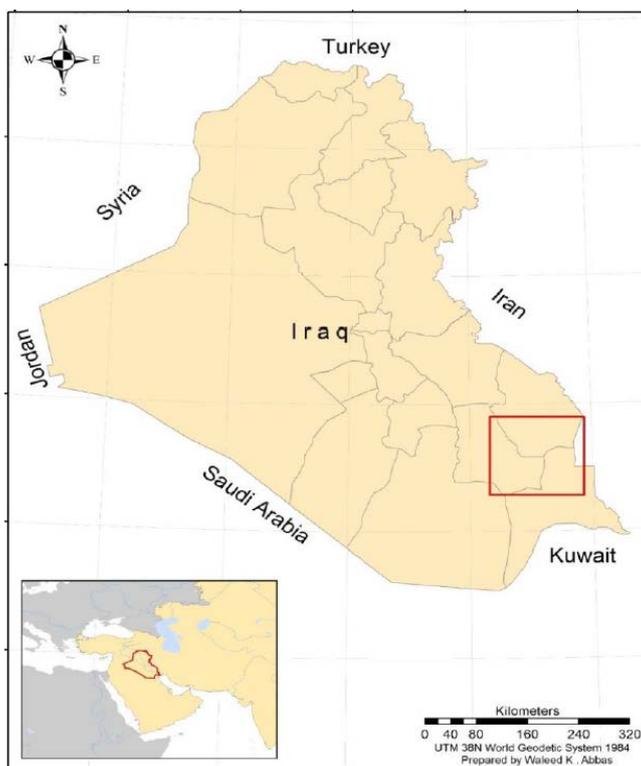
- c) Conduct further studies to confirm the plant and invertebrate diversity within the nominated property and its surrounding landscapes, as a key contribution to reconsidering the nomination;
- d) Complete the designation of all of the components of the nominated property as legally protected areas, and ensure the effective legal protection is in place to regulate oil and gas concessions, and other potentially impacting activities in the buffer zones of the nominated property;
- e) Revise and complete a comprehensive and integrated management plan for a revised nominated property, in Arabic, and ensure its effective consultation and communication with local communities and other stakeholders;
- f) Put in place a programme to ensure an adequate level of protection and effective management capacity for all components of the nominated property, and appropriate capacity building activities, including support for the maintenance of the traditional ecological knowledge held by the men and women of the Ma'adan communities, and for rights-based approaches to management, recognising the customary use of the nominated property.

3. Considers that any revised nomination would need to be considered by an expert mission to the nominated property;

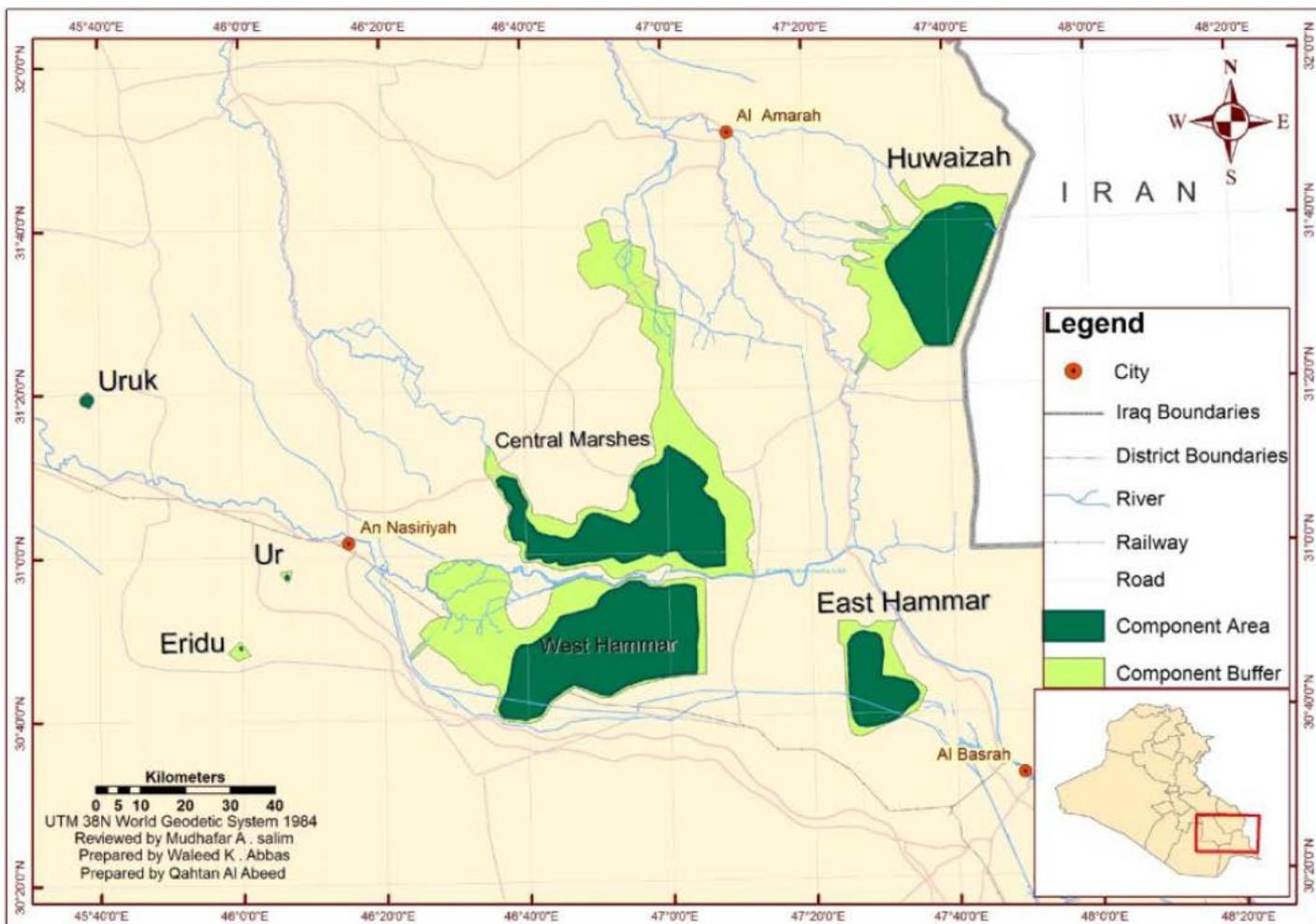
4. Congratulates the Government of Iraq for the restoration work that has been undertaken to recover the wetland areas in the Ahwar of Southern Iraq to date, and strongly encourages this work to continue, and welcomes the mutual dialogue between the State Party of Iraq and the upstream countries (Turkey, Syria and Iran) in order to permanently secure the minimum flows needed to the nominated property and its buffer zones;

5. Takes note of the significant further work required to support this nomination, and requests the World Heritage Centre and the Advisory Bodies, and their relevant regional organisations, in conjunction with UNEP and the Arab Regional Centre for World Heritage, and the Secretariat of the Ramsar Convention, to work in coordination to support inputs to the nomination process that may be requested by the State Party of Iraq.

**Map 1:** Location of the nominated area in Iraq



**Map 2:** Proposed nominated area and buffer zone





ASIA / PACIFIC

## KHANGCHENDZONGA NATIONAL PARK

INDIA



Sacred site in the Khangchendzonga National Park - © IUCN Tilman Jaeger



# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## KHANGCHENDZONGA NATIONAL PARK (INDIA) – ID 1513

**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:** 16 March 2015

**b) Additional information officially requested from and provided by the State Party:** Khangchendzonga National Park is nominated as a mixed site. ICOMOS wrote to the State Party in September, 2015 requesting supplementary information on a range of issues related to the evaluation of cultural values. A joint IUCN / ICOMOS progress report was then sent on 17 December 2015 following the respective ICOMOS and IUCN Panel meetings. Requests were made of the State Party to update the biodiversity inventory for species within the property; consider changes to the configuration of the buffer zone; advise on strategies to engage local communities; clarify how the management of cultural and natural values will be better integrated; elaborate on how traditional management systems will be incorporated; and finally advise on the objectives and protective measures proposed to safeguard the property's spiritual values. The information in response was received from the State Party on 30 January 2016.

**c) Additional literature consulted:** Various sources including: Arrawaita, M.L. and Tambe, S. 2011. *Biodiversity of Sikkim Exploring and Conserving a Global Hotspot*. Department of Information and Public Relations Government of Sikkim, Gangtok. Chettri, N., Shakya, B. and Sharma, E. 2008. *Biodiversity Conservation in the Kangchenjunga Landscape*. Bernbaum E (1998) *Sacred Mountains of the World*. The Mountain Institute. Introduction from the Mountain Forum Online Library. Bhardway AK, Srivastav A, Sathyakumar S, Ansari NA, Mathur VN (2015) *Management Effectiveness Evaluation (MEE) of Khangchendzonga National Park, Sikkim*. Process and Outcomes. Department of Forests, Environment and Wildlife Management, Government of Sikkim and Wildlife Institute of India, Dehradun, Uttarakhand. Chhettri SK, Singh KK, Krishna AP (2013) *Resource Use Impacts within the Forest Land Cover of Khangchendzonga Biosphere Reserve, Sikkim Himalaya along Different Disturbance Levels and Altitudinal Zones*. Applied Ecology And Environmental Research 11(2): 273-291. Chettri N, Shakya B, Sharma E (2008) *Biodiversity Conservation in the Kangchenjunga Landscape*. International Centre for Integrated Mountain Development ICIMOD. Kathmandu, Nepal. Kandel P, Chettri N (n.d.)

*Kangchenjunga Transboundary Conservation and Development Initiative in the Hindu Kush Himalayas*. Prepared for TBPA. Krishna AP, Chhetri S, Singh KK (2002) *Human Dimensions of Conservation in the Khangchendzonga Biosphere Reserve: The Need for Conflict Prevention*. Mountain Research and Development 22(4):328-331. Lachungpa U (2009) *Indigenous Lifestyles and Biodiversity Conservation Issues in North Sikkim*. Indian Journal of Traditional Knowledge 8(1): 51-55. Oli KP, Chaudhary S, Sharma UR (2013) *Are Governance and Management Effective within Protected Areas of the Kangchenjunga Landscape (Bhutan, India And Nepal)?* PARKS 19(1): 25-36. Sathyakumar S, Bashir T, Bhattacharya T, Poudyal K (2011b) *Mammals of the Khangchendzonga Biosphere Reserve, Sikkim, India*. Wildlife Institute of India. Sathyakumar S, Bashir T, Bhattacharya T, Poudyal K (2011) *Mammals of the Khangchendzonga Biosphere Reserve, Sikkim, India*. 327-350 In: Arrawaita ML, Tambe S (eds) (2011) *Biodiversity of Sikkim – Exploring and Conserving a Global Hotspot*. Information and Public Relations Department. (<http://sikkimforest.gov.in/Biodiversity-of-Sikkim.htm>). Tambe S, Rawat GS (2010) *The Alpine Vegetation of the Khangchendzonga Landscape, Sikkim Himalaya*. Mountain Research and Development, 30(3): 266-274. WWF (2015) *Hidden Himalayas: Asia's Wonderland New Species discoveries in the Eastern Himalayas, Volume II, 2009-2014*. [www.worldwildlife.org/publications/hidden-himalayas-asia-s-wonderland](http://www.worldwildlife.org/publications/hidden-himalayas-asia-s-wonderland) Chettri, S. K. Singh, K. K. and Krishna, A. P. 2006. *Anthropogenic pressures on the natural resources in fringe areas of the Khangchendzonga Biosphere Reserve*. International Journal of Ecology and Environmental Sciences. 32 (3): 229-240. Rai, S.C. and Sundriyal, R. C. 1997. *Tourism and biodiversity conservation: The Sikkim Himalaya*. Ambio Vol.26(4): 235-242.

**d) Consultations:** 10 desk reviews received. The mission also met with a wide range of representatives from national, state, district and village level government, site management staff, NGOs and communities including representatives of the indigenous Dokpa people. The mission consulted with the national level Ministry of Culture, Ministry of Human Resource Development (Education) and the Ministry of Environment, Forests and Climate Change. In addition meetings were held with officials from the Indian Forest Service; Khangchendzonga National Park management staff; Director and staff of the Wildlife Institute of India; Sikkim Department of

Ecclesiastical Affairs; Namgyal Institute of Tibetology; local representatives of Eco-Development Committees, a Women's Association and volunteer rangers. In addition, regional WCPA members, the TILCEPA Specialist Group on Sacred Sites, International Centre for Integrated Mountain Development (ICIMOD) and its supporting GIZ programme were consulted prior to and after the mission.

**e) Field Visit:** Tilman Jaeger (IUCN) and Kai Weise (ICOMOS), 28 September - 09 October, 2015

**f) Date of IUCN approval of this report:** April 2016

## 2. SUMMARY OF NATURAL VALUES

Khangchendzonga National Park (KNP) has been nominated as a mixed site under cultural criterion (iii) and natural criteria (vii) and (x). The focus of IUCN's evaluation is on KNP's natural values whilst ICOMOS will evaluate the cultural aspects of the nominated property.

KNP is situated in the Himalayan range in northern India and includes the world's third highest peak, Mt. Khangchendzonga. KNP has an extremely impressive altitudinal range: a vertical sweep of 7,366 meters (m) across an elevational range of 1,220m to 8,586m above sea level (asl) within a relatively small area. The Himalayas are narrowest here resulting in extremely steep terrain which magnifies the distinction between the various eco-zones which characterise the nominated area. As a consequence, KNP contains a remarkable range of eastern Himalaya landscapes and wildlife from sub-tropical to alpine to Trans-Himalayan (Cold Desert) within a small geographical area.

The area nominated for inscription coincides with the boundaries of KNP and totals 178,400 hectare (ha). Established in 2000, the nationally designated Khangchendzonga Biosphere Reserve (KBR) includes the KNP as its core zone with buffer and transition zones following the usual configuration for biosphere reserves. The nominated area is also part of the much larger transnational Kangchenjunga Landscape defined by ICIMOD and spanning areas within Nepal, India and Bhutan. The State Party in supplementary information has confirmed a change in the composition of the World Heritage buffer zone primarily to include a part of the KBR transition zone that contains a cluster of 10 important cultural attributes in the south of the property. The World Heritage buffer zone is made up of parts of the KBR buffer and transition zones and covers a total area of 114,712 ha.

KNP is located within three of the four administrative districts of Sikkim and covers approximately 25% of the entire State. The former kingdom of Sikkim formally became an Indian state only in 1975 and is today the second smallest of all Indian states. KNP was declared in 1977 and its area more than doubled in 1997 to protect an area of spectacular peaks, glaciers and rugged alpine terrain in the Indian part of the Eastern Himalayas. The 1997 extension

broadened the range of ecosystems covered and increased the impressive altitudinal gradient.

KNP shares approximately 45 kms of international border with Nepal to the west where it is contiguous with the Kanchenjunga Conservation Area (KCA). KCA comprises some 200,000 ha of comparable ecosystems along the same vertical gradient, including the shared peak of the Khangchendzonga / Kanchenjunga Massif itself (Kanchenjunga being the Nepali spelling). KNP shares a shorter border with China's Autonomous Region of Tibet.

India's highest peak, Khangchendzonga, at 8,586m asl, literally stands out even within a mountain protected area boasting 20 peaks above 6,000m. The visually prominent Khangchendzonga Massif is actually comprised of five major peaks, which culturally stand for the five treasures salt, gold, turquoise, arms and (combined) medicine and seeds. The massif, literally named the "Abode of the Gods", has exceptional symbolical, cultural, religious and spiritual significance for many ethnic peoples and religious beliefs across and beyond the Himalayas.

Numerous lakes and glaciers, including the 26 km long Zemu Glacier, dot the barren high altitudes. The glaciers feed important rivers, creeks and wetlands within the seven major watersheds of KNP. While most of KNP is located within the Greater Himalayas, the nominated area transitions into the distinct cold deserts of the Trans-Himalaya towards the north. Towards the east and south, the mountain landscape abruptly descends in the form of large and exceptionally steep valleys. Along the altitudinal gradient, a pronounced zonation is visible within the vegetation. Peri-glacial and sub-nival vegetation can reach up to 5,500m, replaced by various types of alpine meadows below. The treeline can climb well above 4,000m in the extensive Rhododendron scrubs (krummholz). Depending on slope and the exposure levels, closed conifer forests extend up to around 4,000m. Further down, the forests transition into mixed temperate and eventually deciduous temperate forest. In the lowest elevations of KNP, there are small pockets of lush sub-tropical broadleaf forest, representative of Sikkim's much larger sub-tropical forests, some of which are located in the proposed buffer zone.

The nomination dossier incorrectly notes that KNP is located within Indo-Burma biodiversity hotspot when it is actually coincident with the Himalaya biodiversity hotspot to the northwest of the former. The park boasts an unusually diverse flora and fauna with many rare and endangered species, some of them endemic. The different altitudinal zones provide habitat for markedly distinct faunal and floral assemblages. Supplementary information has confirmed that overall, some 1,580 species of vascular plants have been confirmed in the larger KBR including 106 pteridophytes, 11 gymnosperms and 1,463 species of angiosperms. KNP also exhibits unusually high lichen diversity with some 114 species confirmed. Eleven broad vegetation types have been identified, each confined to specific elevational ranges and topographic niches and each

with corresponding faunal assemblages. 22 plant species are IUCN Red Listed, 19 of which are threatened (CR, EN or VU). 28 plants are reported as endemic although the nomination does not make clear if all are found within KNP.

The nomination originally reported some 447 vertebrate animal species within the nominated area including 124 species of mammals, 300 bird, 10 reptile, 5 amphibian and 8 fish species. IUCN sought verification on these numbers which appeared to be inaccurate and supplementary information has revised the numbers for some taxa. Revised species lists were provided for birds and mammals. The numbers of bird species for example have been revised from 300 to 213 species of birds and from 124 to 45 for mammal species. Based on this a revised total of 281 vertebrates can be concluded as occurring within the nominated area. However, it is clear that data is patchy and more inventory work is required to confirm the species numbers within the nominated area as opposed to the larger KBR. However, recent camera-trapping confirms that the mammal species encompass numerous rare and endangered species and probably the full array of naturally occurring predators. Asiatic Black Bear (VU) and at least four canids, including the elusive Asiatic Wild Dog (EN) and the Tibetan Wolf (CR) have recently been confirmed. The Snow Leopard (EN) is the flagship species of KNP, one of three leopard species and six confirmed (possibly eight) cat species found within KNP. The charismatic Red Panda (EN) is the State Animal of Sikkim and is likewise found in the lower altitude forests of KNP, its buffer zone and nearby protected areas. Among the insects, butterflies are extremely abundant in Sikkim State which is home to an estimated 46% of India's butterfly species. Sikkim boasts up to 650 species, and supplementary information confirms 189 of which are recorded within KNP (revised down from an originally claimed 400 species).

KNP coincides with an Important Bird Area (IBA) and is part of an Endemic Bird Area (EBA). Among the most conspicuous bird species are the many large birds of prey, several species of Old World Vultures and numerous pheasant species, including the spectacular Blood Pheasant (LC), the State Bird of Sikkim. The Lhonak Valley is a Trans-Himalayan grassland, which is partially included in KNP and the only known breeding site of the Black-necked or Tibetan Crane (VU) in the Eastern Himalayas as well as an important stopover for migratory waterbirds.

### 3. COMPARISONS WITH OTHER AREAS

The nomination dossier contains an analysis that, for natural values, compares KNP to other sites with comparable ecosystems characteristic of a wide altitudinal range and which are recognised as global conservation priorities. For criterion (vii) comparisons are made with sites displaying similar natural beauty and aesthetic importance, in this case mountain sites with sweeping altitudinal ranges. IUCN notes that consideration of the nominated area's aesthetics under

criterion (vii) as worded in the Operational Guidelines should focus upon the natural phenomenon, beauty and aesthetics of the nominated area. However, it should of course be acknowledged that as a mixed nomination the human appreciation of the site's value is intrinsically entwined with its cultural values and spiritual importance.

The analysis within the nomination compares the nominated property to a reasonably wide range of existing World Heritage and Tentative Listed properties on the basis of comparable contexts. Nevertheless there are some comparisons which do not appear immediately obvious such as Manas Wildlife Sanctuary which is a lowland system. Whilst altitudinal range is a principal determinant for comparison, contrasted sites are from a diversity of biogeographic settings. There are some areas which in IUCN's view should have been analysed in greater depth. For example the KCA in Nepal is not considered despite the fact that it adjoins KNP and shares many species with the nominated area including the home ranges of some key species such as Snow Leopards and several ungulates. IUCN notes the potential for future transnational cooperation with Nepal as Mt Khangchendzonga effectively straddles the border between the two countries. Another example concerns the only superficial comparison made with Central Karakorum National Park in Pakistan. This site contains the world's second highest mountain K2, more than 60 peaks over 7,000m and the largest glacial field outside of the poles with several impressively long glaciers such as Siachen (75 km), Baltoro (57 km), and Hispur-Biafo (122 km) Glaciers.

Despite some shortcomings in the nomination's comparative analysis, it provides some compelling arguments supporting KNP's global biodiversity significance (extreme vertical gradient; exceptional diversity of forest types and species; and the richness of mammals). To supplement the analysis IUCN has undertaken further assessment with the support of UNEP-WCMC.

The scientific literature confirms KNP's considerable biodiversity values and the case for global importance is supported by a number of priority-setting schemes and other documents. A common, very broad classification distinguishes the Western Himalayas from the Eastern Himalayas. KNP falls into the latter which is ecologically quite distinct from the Western Himalayas and Central Asian mountain ranges adjacent to the west and north. It can be argued that KNP is therefore not directly comparable to existing properties like Nanda Devi and Valley of Flowers National Parks, Great Himalayan National Park Conservation Area, Sagarmatha National Park, Tajik National Park (Mountains of the Pamirs) and other protected areas in that region despite many similarities.

KNP's extraordinary vertical gradient exceeding 7 kms is stunning. Strictly speaking, the gradient is not unique as claimed by the State Party. The contiguous KCA in Nepal boasts an identical altitudinal difference and the nearby Makalu Barun National Park also in

Nepal is documented as having a wider altitudinal range of 8,119 m within a smaller area of 150,000 ha. Nevertheless, there are not many places in the world where such a gradient is possible at all and KNP is without doubt a great and rare example.

KNP contains a diverse range of eastern Himalaya landscapes: it covers three terrestrial biomes, of which the Indo-Malay Temperate Broadleaf and Mixed Forests biome is not yet represented on the World Heritage List. In addition, two of the four ecoregions present within KNP are also not currently represented on the List. KNP also belongs to the Himalaya terrestrial biodiversity hotspot, and two terrestrial priority ecoregions, of which the Eastern Himalayan Alpine Meadows is not currently represented on the List by a biodiversity site.

KNP, along with the adjacent reserve forests, is home to some 22 endemic, rare and threatened plant species. The property provides habitat for Snow Leopard, the largest Himalayan carnivore and a globally endangered species, other threatened species such as the Alpine Musk Deer (EN), Clouded Leopard (VU), Red Panda, Wild Dog and Asiatic Black Bear. KNP is part of the Eastern Himalaya EBA which hosts at least 127 bird species of conservation concern, including seven globally threatened and restricted range species. The property also covers most of an IBA which is one of the highest in the world. Birds from at least four biomes are found in this IBA due to its size and high elevations.

UNEP-WCMC note that KNP ranks in the top 0.7-1.2% of all protected areas assessed worldwide for their irreplaceability for species conservation (1246<sup>th</sup> most irreplaceable protected area in the world, and 2135<sup>th</sup> regarding threatened species).

Of particular note is IUCN's 2002 global overview of mountain protected areas which refers to the trinational Khangchendzonga area (Nepal, India and China) as one of 28 mountain areas worldwide with "strong potential" for World Heritage. This study alludes to the fact that this area includes the "World's third highest peak", a "variety of life zones from subtropics to alpine", as well as "sacred values and cultural features". Among the 28 sites with "strong potential", only two others are located within the Himalayas (Mustang region and Bhutan's Jigme Dorji National Park).

In conclusion with respect to criterion (vii) KNP's grandeur is undeniable and the Khangchendzonga Massif and other peaks and landscape features are revered across several cultures and religions. While not the highest mountain in the world, a case can be made that Khangchendzonga is nevertheless a superlative peak within one of the most spectacular mountain ranges globally. The combination of extremely high and rugged mountains covered by intact old-growth forests up to the unusually high timberline further adds to the exceptional landscape beauty.

In regard to criterion (x) KNP is located within a mountain range of global biodiversity conservation significance and is the core zone of the KBR. The nominated property covers 25% of the State of Sikkim, acknowledged as one of the most significant biodiversity hotspots of India. KNP houses nearly half of the nation's bird diversity, wild trees, orchids and rhododendrons and one third of the country's flowering plants. It also contains the most extensive zone of krummholz (stunted forest) in the Himalayan region. KNP along with the adjacent reserve forests is home to a significant number of endemic, rare and threatened plant and animal species. The nominated property has the highest number of plant and mammal species recorded in the Central/High Asian Mountains, except compared to the Three Parallel Rivers of Yunnan Protected Areas, in China; and also has a high number of bird species.

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

KNP was legally declared in 1977 and extended in 1997. The park is the equivalent of an IUCN Category II protected area and is strongly protected under India's national Wildlife (Protection) Act of 1972. The Act includes elements of both area-based and species-based conservation and both are applicable to KNP. The Forest Conservation Act of 1980 adds another layer of legal protection to the legally declared forests within KNP and its buffer zone. The legal protection is adequate and whilst there are no signs of past or current attempts to call the strong protection status into question, the development of hydropower, and the extraction of timber and minerals are not categorically excluded. Such change would, however, require complex and demanding procedures, which would have to fully consider conservation aspects. Noteworthy further legislation includes India's Places of Worship Act which regulates access rights for religious and spiritual purposes. A notification identifies the key sites of religious and spiritual importance in Sikkim, including KNP. Another state level notification prohibits the scaling of sacred peaks, including in particular Khangchendzonga.

The entire nominated area is state-owned and so is most of the biosphere reserve buffer zone. There is some private land in the biosphere reserve buffer zone, where families have small agricultural plots excised from reserved forest status. The property's buffer zone corresponds with two zonings within the national level biosphere reserve: the biosphere reserve buffer zone is protected as Reserve Forest, however the KBR transition zone is aimed at supporting livelihoods and is subject to less stringent protection.

The legal regime, steep terrain and difficult access of the nominated property combine to ensure a very good level of protection.

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

## 4.2 Boundaries

The nominated property boundaries are considered adequate and include the necessary range of attributes in support of the proposed Outstanding Universal Value. Most of the altitudinal vegetation and habitat zones are well-represented, however some of the lower altitudes forest types are less well represented. The evaluation mission noted that many of these lower altitude forests are in good condition and would be suitable as progressive additions to the nominated area.

The configuration of the buffer zone is, for the most part, rational and the status of much of the area as reserved forest legally underpins its buffering function; however, it is noted that the World Heritage buffer zone comprises two different zones of the KBR each with different management objectives. There is no buffer zone to the east as KNP's boundary coincides with the international border with Nepal and along a few kilometres with China. The rationale for the lack of a buffer zone adjacent to the northern edge of KNP relates to the remoteness and inaccessibility of this area. The lack of a buffer zone in parts of Rangyong Chu watershed is less plausible, as the intensively used "transition zone" in those areas is directly adjacent to the nominated area. It was explained that this was a function of the legal status of the land in that area which is not "reserved forest" and thus cannot formally be declared a buffer zone. The lack of a buffer zone in parts of this watershed implies that KNP might be more vulnerable to human impacts here and this will need to be monitored. The State Party's decision to extend the buffer zone in the Rathang Chu area is primarily concerned with cultural values, however it also adds additional protection to this area which was previously without a buffer zone.

India has a system of eco-sensitive zones which surround protected areas. These are designed to protect environmentally sensitive areas from development and resource exploitation. In KNP an eco-sensitive zone of between 25-200m has been recently notified. This has been a controversial issue as the zones have been reduced from a recommended 10 kms. These zones exist outside of the nominated property however it remains somewhat unclear as to how they will be implemented within the much larger proposed World Heritage buffer zone of KNP.

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

## 4.3 Management

The Forest, Environment and Wildlife Management Department, Government of Sikkim (FEWMD) and its KNP administration unit is the primary management authority. The KNP Management Plan (2008-2018) provides overarching guidance and zonation is a key management instrument. In addition to the three zones of the biosphere reserve, there is an internal zonation of the nominated area into "wilderness", "habitat improvement" and "ecotourism" zones.

The formal arrangement is top-down with decision-making in the hands of FEWMD. There is direct exchange and coordination with other governmental branches at the state level and with the central government (Indian Forest Service, which is represented in Sikkim). There is limited evidence of systematic inputs of local stakeholders in decision-making. In 1990, India initiated the concept of Joint Forest Management Committees (JFMC) / Eco-development Committees (EDC) as a mechanism to engage local communities. Starting in 2002 a number of EDCs have been created in the buffer zone around KNP. In essence, the scheme promotes on-farm and off-farm income generation near reserved forests and protected areas as a means to reduce pressure. The scheme has drawn major attention as a policy shift but does not amount to granting rights in decision-making and it does not primarily refer to KNP but rather its buffer zone. The State Party in its supplementary information has restated the importance of the 21 EDCs which operate across the property. The State Party has indicated that local EDCs will play an active role in the day to day maintenance, monitoring, management and protection of the cultural attributes inside the KNP and the buffer areas and be given increased responsibility for managing nature-culture linkages.

KNP's management authorities have conducted a management effectiveness evaluation (MEE) in 2015 with the support of the Wildlife Institute of India. This is a commendable systematic assessment of the management of the park using the internationally accepted IUCN MEE Framework. A scorecard system has been used to pinpoint management strengths and weaknesses and gain some relative indicator of the effectiveness of KNP's management against other sites in India. The property ranked in the 'good' category. Whilst the evaluation uses a simplified set of indicators it highlights a number of actionable points to address weaknesses.

The administrative arrangements for the KNP are quite hierarchical, of positive note is the fact that the KNP Director also has responsibility for the KBR which is empowering in terms of the larger system. The nomination conceded that staffing numbers and expertise should be increased in line with increasing management responsibility particularly related to buffer zone issues. The recent MEE evaluation also noted weaknesses in staff expertise and numbers. However given the low levels of threat to the core areas of the property the evaluation mission did not perceive any evidence of a dramatic capacity gap. Volunteer rangers from fringe villages contribute to wildlife monitoring and patrolling, in cooperation with KNP and WWF.

Funding relies mostly on the government. The Government of Sikkim provides a basic budget, which has been slightly increasing over the last years but is in essence restricted to covering the salaries of the limited number of staff. KNP has also benefited from donor funding for example via a Japanese supported project which strongly supported the nomination effort.

Funding is “inadequate” according to the recent MEE, which suggests a need to increase and diversify funding.

A final important point relates to the fact that KNP has been nominated as a mixed site in deference to its entwined natural and cultural values. However, the nomination has been conceptualised from a nature perspective with cultural aspects considered later and the history of site management, the legal and governance arrangements reflect this bias to nature. Whilst this is understandable it is important to redress the management emphasis to ensure an appropriate balance between the natural, cultural and spiritual aspects of the property.

Whilst noting the need to improve the integration of natural and cultural heritage management and a number of weaknesses highlighted by the recent management effectiveness evaluation, IUCN considers the management of the nominated property nevertheless meets the requirements of the Operational Guidelines.

#### 4.4 Community

What is today KNP has traditionally and into the recent past been inhabited and used by Dokpa, Bhutia, Lepcha and Nepali people and temporarily by Tibetan refugees in the 1960s. Today, national legislation categorically excludes permanent human presence and consumptive resource use in KNP, including livestock grazing, inevitably creating a source of contention. There are no resident populations within the nominated area and some communities have been re-settled and/or lost access to traditionally used livestock grazing and forest areas. While not per se related to the World Heritage nomination, this is one important legacy of the national park.

A complex issue concerning the governance and management of KNP is the relationship with indigenous peoples (“scheduled tribes”) and local communities (“fringe villages”). On the one hand, the cultural and spiritual meaning of KNP is fully acknowledged and there appear to be no conflicts in terms of access to cultural sites and resources. On the other hand, the recognition of the cultural meaning of KNP does not encompass resource use practices, traditional livelihood systems, local knowledge etc., which could reasonably be interpreted as elements of local and indigenous cultures. There is a contradiction between the legal ban on any resource use, including livestock grazing, and a vision of “ensuring sustainable flow of resources for traditional livelihood” and an objective “to allow controlled use of the Park and its resources by local people” both of which are stated in the management plan. On a positive note the State Party has advised that the traditional system of rotational alpine grazing by the Dokpa people will be integrated in the management plan and as a first step the Dokpa’s traditional right of livelihood through herding of yaks has been recognized by formalizing their community into an EDC. Nonetheless sustained effort will be needed to empower more participatory approaches to the management of the property, and

more importantly to implement genuine reforms that facilitate local community access to the resources of KNP in such a way that is sustainable and does not damage core values.

As in most of the other India protected areas, management is typically top-down. On the ground management has direct communication with local villagers but there are no formal mechanisms enabling local stakeholders to take part in decision-making. The authorities acknowledge this and are actively working to address more inclusive approaches to conservation in the face of human and development pressure.

#### 4.5 Threats

KNP enjoys a very high degree of natural protection, in particular in the large areas of extremely high and rugged terrain. There is no indication in the nomination file, field evaluation mission nor desk reviews of any serious current threats (for example from climate change, increasing tourism, local resources use, invasive species and/or natural disasters) to the property, its integrity and its outstanding values. However there are potential threats related to these issues.

As with most other mountain systems, changes to temperature and precipitation could impact on the ecology of KNP in many ways, including the dynamics of the altitudinal zonation. Management should make every effort to monitor and understand change as a basis of informed decision-making in terms of preparedness and adaptation.

The State of Sikkim encourages tourism development and KNP is among the most obvious and marketable resources. KNP is a renowned mountaineering destination with a history going back at least to the early 20<sup>th</sup> Century. More recently, a trekking industry has locally developed in selected areas. Visitors to KNP have steadily increased since the early 2000s but remain low at less than 3,500 per annum. Mountaineering is modest in scale and strictly regulated. Disturbance and inadequate waste management are problems well-known from other parts of the Himalayas and require attention; however, large scale, commercial mountaineering has not arrived in Sikkim but may develop in the future. In KNP the peaks themselves must not be accessed for cultural and religious reasons, however, it is unknown whether all expeditions have respected this rule. In theory, Khangchendzonga is the only peak in the world above 8,000 m which has never been scaled. Trekking tourism is still in its infancy but expected to grow bringing with it potential benefits to local people but also impacts. At today’s visitor numbers and management, there are no signs that the evolving trekking tourism has yet resulted in major impacts but a likely further increase will require more careful planning and management. Pilgrimages are an important and particular form of visitation of KNP. Access to culturally and religiously important resources should be maintained while making every effort to fully respect sensitivities related to sacred sites and to prevent environmental damage.

Sikkim has signalled a decision to massively develop the state's high hydro-power potential. This has been generating conflicts both on environmental and religious / spiritual grounds, illustrated by the controversial dams on the nearby Teesta, Sikkim's major river. Forestry has a strong say in decision-making and it is noteworthy that several planned dam projects in the buffer zone have reportedly been rejected in the past on conservation grounds.

Mobile pastoralism has been a central element of the traditional local livelihood systems in Sikkim, including what is today KNP, both in the form of transhumance and nomadism. Sikkim's FEWMD banned open grazing in 1998 in both protected areas and reserved forests, plantations and near water sources and embarked on stricter enforcement. Cattle sheds have since been removed from KNP, whereas some grazing by yaks and sheep appears to be de facto accepted. Despite some evidence of low level grazing there is a policy to control high elevation grazing. Trekking use is supported by pack animals resulting in some localised grazing impacts but generally the nominated property is free from any major signs of overgrazing. Local subsistence use of non-timber forest products and medicinal plants continues at modest levels without appreciable impacts. A ban on the commercial exploitation of medicinal plants and aromatic plants used for incense was imposed in 2001 and continues. Hunting and trapping of birds and mammals has long been a part of traditional livelihood systems, both for food and medicinal purposes. It is today categorically banned, i.e. considered as poaching. Park management, WWF and volunteer rangers report occasional poaching and trapping but overall the threat is considered minimal. Some human-wildlife conflict occurs in the fringe villages with some predation on livestock reported. IUCN recognises the challenges in heavily populated areas, however supports policies and management which permits some level of sustainable local use compatible with World Heritage status.

The exceptionally steep slopes coupled with heavy rainfall result in seasonally extreme surface runoffs and frequent and often large landslides, visible in all parts of the nominated area. Within KNP, the risks are not associated with human disturbance or land degradation and thus considered an entirely natural disturbance factor.

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

## 5. ADDITIONAL COMMENTS

KNP is an integral part of a much larger mountain landscape crossing several international borders. For example the ICIMOD supported Kangchenjunga Landscape recognises this wider conservation system and there are clear opportunities to enhance transnational collaboration, particularly with Nepal which shares a common border across the Khangchendzonga / Kanchenjunga Massif.

Nevertheless, KNP is relatively large and consistently features as a particularly valuable protected area in the literature. The nomination is thus considered coherent and strong on its own merits.

## 6. APPLICATION OF CRITERIA

**Khangchendzonga National Park** has been nominated under natural criteria (vii) and (x), as well as under cultural criterion (iii) which will be evaluated by ICOMOS.

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

The scale and grandeur of the Khangchendzonga Massif and the numerous other peaks within Khangchendzonga National Park are extraordinary and contribute to a landscape that is revered across several cultures and religions. The third highest peak on the planet, Mt. Khangchendzonga (8,586m asl) straddles the western boundary of Khangchendzonga National Park and is one of 20 picturesque peaks measuring over 6,000m located within the park. The combination of extremely high and rugged mountains covered by intact old-growth forests up to the unusually high timberline and the pronounced altitudinal vegetation zones further adds to the exceptional landscape beauty. These peaks have attracted people from all over the world, mountaineers, photographers and those seeking spiritual fulfilment. The park boasts eighteen glaciers including Zemu Glacier, one of the largest in Asia, occupying an area of around 10,700 ha. Similarly, there are 73 glacial lakes in the property including over eighteen crystal clear and placid high altitude lakes.

IUCN considers that the nominated property meets this criterion.

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

Khangchendzonga National Park is located within a mountain range of global biodiversity conservation significance and covers 25% of the State of Sikkim, acknowledged as one of the most significant biodiversity concentrations in India. The property has one of the highest levels of plant and mammal diversity recorded within the Central/High Asian Mountains. Khangchendzonga National Park is home to nearly half of India's bird diversity, wild trees, orchids and rhododendrons and one third of the country's flowering plants. It contains the widest and most extensive zone of krummholz (stunted forest) in the Himalayan region. It also provides a critical refuge for a range of endemic, rare and threatened species of plants and animals. The national park exhibits an extraordinary altitudinal range of more than 7 kilometres in a relatively small area giving rise to an exceptional range of eastern Himalaya landscapes and associated wildlife habitat. This ecosystem mosaic provides a critical refuge for an impressive range of large mammals, including several apex predators. A remarkable six cat species have been confirmed (Leopard, Clouded Leopard, Snow Leopard, Jungle Cat (LC), Golden Cat (NT), Leopard Cat (LC)) within the park. Flagship species include Snow Leopard as the largest Himalayan predator,

Jackal, Tibetan Wolf, large Indian Civet (NT), Red Panda, Goral, Blue Sheep (LC), Himalayan Tahr (NT), Mainland Serow, two species of Musk Deer, two primates, four species of pika and several rodent species, including the parti-colored Flying Squirrel (LC).

IUCN considers that the nominated property meets this criterion.

## 7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopts the following draft decision, noting that this will be harmonised as appropriate with the recommendations of ICOMOS regarding their evaluation of this mixed site nomination under the cultural criterion and included in the working document WHC-16/40.COM/8B:

The World Heritage Committee,

1. Having examined Documents WHC/16/40.COM/8B and WHC/16/40.COM/INF.8B2;
2. Inscribes the **Khangchendzonga National Park (India)** on the World Heritage List under natural criteria (vii) and (x);
3. Adopts the following Statement of Outstanding Universal Value:

### **Brief synthesis**

*Situated in the northern Indian State of Sikkim, Khangchendzonga National Park (KNP) exhibits one of the widest altitudinal ranges of any protected area worldwide. The Park has an extraordinary vertical sweep of over 7 kilometres (1,220m to 8,586m) within an area of only 178,400 ha and comprises a unique diversity of lowlands, steep-sided valleys and spectacular snow-clad mountains including the world's third highest peak, Mt. Khangchendzonga. Numerous lakes and glaciers, including the 26 km long Zemu Glacier, dot the barren high altitudes. The property falls within the Himalaya global biodiversity hotspot and displays an unsurpassed range of sub-tropical to alpine ecosystems. The Himalayas are narrowest here resulting in extremely steep terrain which magnifies the distinction between the various eco-zones which characterise the property. The Park is located within a mountain range of global biodiversity conservation significance and covers 25% of the State of Sikkim, acknowledged as one of India's most significant biodiversity concentrations. The property is home to a significant number of endemic, rare and threatened plant and animal species. The nominated property has the highest number of plant and mammal species recorded in the Central/High Asian Mountains, except compared to the Three Parallel Rivers of Yunnan Protected Areas, in China; and also has a high number of bird species.*

*Khangchendzonga National Park's grandeur is undeniable and the Khangchendzonga Massif, other peaks and landscape features are revered across*

*several cultures and religions. The combination of extremely high and rugged mountains covered by intact old-growth forests up to the unusually high timberline further adds to the exceptional landscape beauty.*

*The fringe area of KNP also harbours an assemblage of cultural elements of the local peoples who have maintained their traditional identities, cultures and religious practices. The protected area status of KNP preserves its cultural uniqueness, and conserves its exceptional aesthetic value and biodiversity. For local communities in Sikkim, KNP and the buffer and transition zones of the Khangchendzonga Biosphere Reserve that act as buffer to KNP, have significant cultural and religious values, which complement the value of its natural beauty and biodiversity.*

### **Criteria**

#### **Criterion (vii)**

*The scale and grandeur of the Khangchendzonga Massif and the numerous other peaks within Khangchendzonga National Park are extraordinary and contribute to a landscape that is revered across several cultures and religions. The third highest peak on the planet, Mt. Khangchendzonga (8,586m asl) straddles the western boundary of Khangchendzonga National Park and is one of 20 picturesque peaks measuring over 6,000m located within the park. The combination of extremely high and rugged mountains covered by intact old-growth forests up to the unusually high timberline and the pronounced altitudinal vegetation zones further adds to the exceptional landscape beauty. These peaks have attracted people from all over the world, mountaineers, photographers and those seeking spiritual fulfilment. The park boasts eighteen glaciers including Zemu Glacier, one of the largest in Asia, occupying an area of around 10,700 ha. Similarly, there are 73 glacial lakes in the property including over eighteen crystal clear and placid high altitude lakes.*

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

*Khangchendzonga National Park is located within a mountain range of global biodiversity conservation significance and covers 25% of the State of Sikkim, acknowledged as one of the most significant biodiversity concentrations in India. The property has one of the highest levels of plant and mammal diversity recorded within the Central/High Asian Mountains. Khangchendzonga National Park is home to nearly half of India's bird diversity, wild trees, orchids and rhododendrons and one third of the country's flowering plants. It contains the widest and most extensive zone of krummholz (stunted forest) in the Himalayan region. It also provides a critical refuge for a range of endemic, rare and threatened species of plants and animals. The national park exhibits an extraordinary altitudinal range of more than 7 kilometres in a relatively small area giving rise to an exceptional range of eastern Himalaya landscapes and associated wildlife habitat. This ecosystem mosaic provides a critical refuge for an impressive range of large mammals, including several apex predators. A remarkable six cat species have been confirmed (Leopard, Clouded Leopard, Snow Leopard, Jungle Cat, Golden Cat, Leopard Cat) within*

the park. Flagship species include Snow Leopard as the largest Himalayan predator, Jackal, Tibetan Wolf, large Indian Civet, Red Panda, Goral, Blue Sheep, Himalayan Tahr, Mainland Serow, two species of Musk Deer, two primates, four species of pika and several rodent species, including the parti-colored Flying Squirrel.

### **Integrity**

Khangchendzonga National Park has an adequate size to sustain the complete representation of its Outstanding Universal Value. The Park was established in 1977 and later expanded in 1997 to include the major mountains and the glaciers and additional lowland forests. The more than doubling in size also accommodated the larger ranges of seasonally migrating animals. The property comprises some 178,400 ha with a buffer zone of some 114,712 ha included within the larger Khangchendzonga Biosphere Reserve which overlays the property. The property encompasses a unique mountain system comprising of peaks, glaciers, lakes, rivers and an entire range of ecologically-linked biological elements, which ensures the sustainability of unique mountain ecosystem functions.

The representativeness of lower altitude ecosystems within the property could be improved by considering progressive additions of what are well protected and valuable forests in the current buffer zone. The functional integrity of this system would also profit from opportunities to engage with neighbouring countries such as Nepal, China and Bhutan which share the wider ecosystem: the most obvious collaboration being with the Kanchenjunga Conservation Area in Nepal as this protected area is contiguous with Khangchendzonga National Park and Mt Khangchendzonga effectively straddles the border between the two countries.

There are no significant current threats for the property however, vigilance will be required to monitor and respond to the potential for impact from increasing tourism as a result of publicity and promotion. Similar attention must be paid to the potential impact of climate change on the altitudinal gradients within the property and the sensitive ecological niches which provide critical habitat. Active management of the buffer zone will be essential to prevent unsympathetic developments and inappropriate landuses from surrounding local communities whilst at the same time supporting traditional livelihoods and the equitable sharing of benefits from the park and its buffer zone.

### **Protection and Management requirements**

The protected area status of KNP under the Wildlife (Protection) Act, 1972 of India ensures strong legal protection of all fauna and flora as well as mountains, glaciers, water bodies and landscapes which contribute to the habitat of wildlife. This also assures the protection and conservation of the exceptional natural beauty and aesthetic value of the natural elements within the Park.

The property is managed by the Sikkim Forest, Environment and Wildlife Management Department under the guidance of a management plan with a vision to conserve key ecosystem and landscape attributes whilst promoting recreational opportunities, cultural and educational values as well as the advancement of scientific knowledge and strategies which advance the well-being of local communities. Opportunities should be taken to better empower local people and other stakeholders into decision making related to the property's management.

Efforts should continue to expand knowledge of the property's biological and ecological values as data is still inadequate. Inventory, research and monitoring should focus on clarifying the species composition within the property and informing policy and management.

Periodic evaluation of the effectiveness of management should continue and be used to direct investment into priority areas so that financial and staff resources are matched to the challenges of future management.

Khangchendzonga National Park displays a rich intertwined range of natural and cultural values which warrant a more integrated approach to the management of natural and cultural heritage. Legal protection, policy and management should be progressively reformed and improved to ensure an appropriate balance between the natural, cultural and spiritual aspects of the property.

4. Commends the State Party for undertaking a comprehensive evaluation of management effectiveness and encourages it to address the 12 recommended actionable points in an integrated and adaptive manner in keeping with the cultural values of the property;

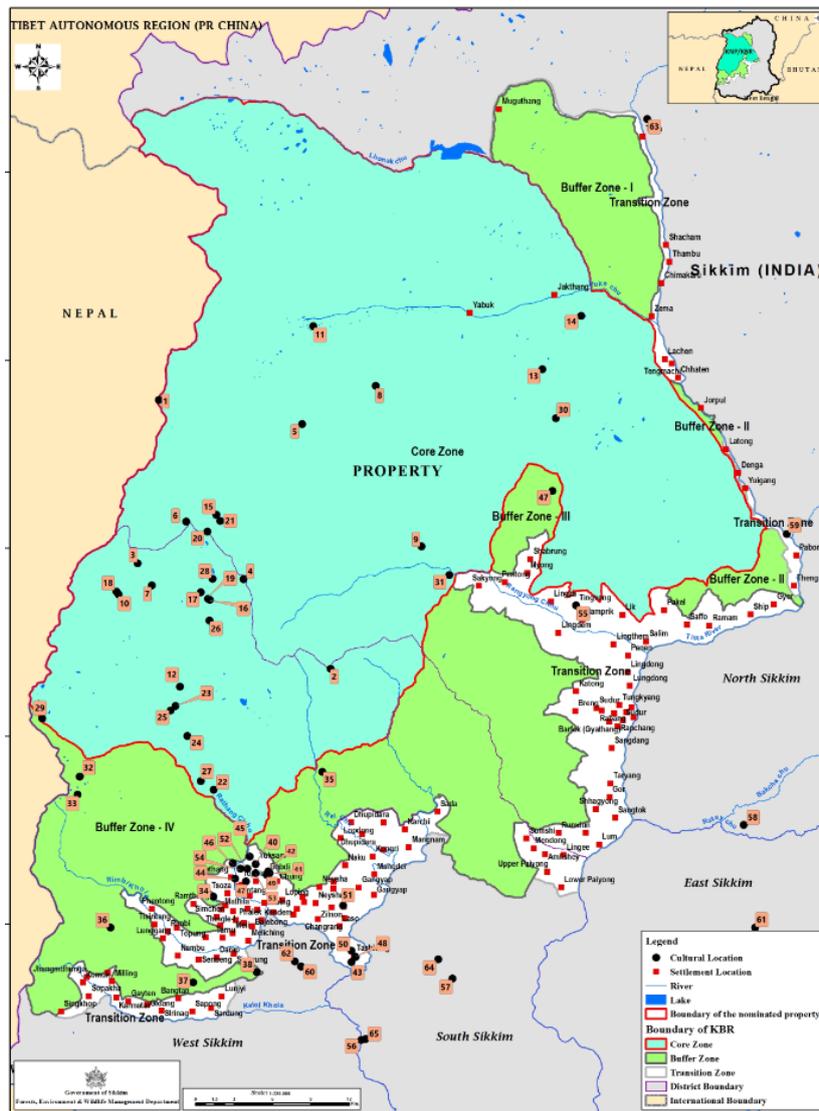
5. Encourages the State Party to consider the progressive addition of suitable lower altitude areas to the inscribed property in order to improve the balance of ecosystems and habitats across the property's more than 7 kilometre vertical gradient;

6. Further encourages the State Parties of India and Nepal to foster greater collaboration between Khangchendzonga National Park (India) and Kanchenjunga Conservation Area (Nepal) noting that Mt Khangchendzonga effectively straddles the border between the two countries, and the similarities between the ecosystems of the two protected areas and thus the potential for a future transboundary World Heritage extension of Khangchendzonga National Park.

**Map 1:** Location of the nominated property in Sikkim State, India



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



## **B. MIXED PROPERTIES**

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



**EUROPE / NORTH AMERICA**

**PIMACHIOWIN AKI**

**CANADA**



Boreal forest and waterways - © IUCN Bastian Bertzky



# WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

## PIMACHIOWIN AKI (CANADA) – ID 1415 Rev

**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.

**Background note:** Pimachiowin Aki (PA) was initially nominated as a mixed site under criteria (v) and (ix) in 2012. The ICOMOS and IUCN evaluations considered that Outstanding Universal Value had not been demonstrated. The World Heritage Committee deferred the nomination in 2013 (Decision 37 COM 8B.19) in order to allow the State Party to (a) consider revisions to the boundaries of the property to meet integrity requirements in relation to criterion (ix), and (b) consider if the inter-relationship between culture and nature within the property could satisfy one or more of the cultural criteria. The Committee also recommended the State Party invite a joint ICOMOS and IUCN advisory mission in order to address these issues, and noted that this nomination had raised fundamental questions about the largely separate evaluation processes of IUCN and ICOMOS for mixed nominations that needed to be addressed by the World Heritage Centre and Advisory Bodies.

A joint ICOMOS and IUCN advisory mission to the property took place in October 2013. With respect to natural heritage, the mission concluded that criterion (ix) is the correct natural criterion to be considered for the property, and the re-nomination could make a stronger case for this criterion than the 2012 nomination, including through a strengthened justification and comparative analysis; that if a well justified nomination was made, that the originally proposed boundaries could potentially be considered by both Advisory Bodies as an adequate solution for a mixed nomination; and that the traditional use aspects should be more emphasized and elaborated on in relation to criterion (ix), and to the integrity, protection and management of the property.

IUCN notes that the nomination is unchanged with respect to its boundaries and area and is once again submitted for consideration under the same natural criterion (ix), but different cultural criteria, and with revised justifications for inscription. The Committee's attention is drawn to IUCN's 2013 evaluation (Document 37COM-8B2INF pp 136-143).

### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 16 March 2015

**b) Additional information officially requested from and provided by the State Party:** Following the joint IUCN-ICOMOS evaluation mission of August 2015, two pieces of additional information were informally requested from the State Party: firstly a finer scale map to accurately plot the property and its buffer zone boundaries, and secondly further elaboration of the decision making processes followed in the governance and management of the property, in particular mechanisms to resolve any inter-community conflict. The State Party responded outlining governance arrangements on 14 September 2015 and providing a more detailed map on 19 November 2015. IUCN relayed to the State Party a progress report on the evaluation following its Panel meeting in December 2015. No further additional information was requested.

**c) Additional literature consulted:** IUCN recalls its evaluation of 2013 and a range of references which were consulted at that time. These references remain relevant to the current nomination but have not been repeated here. Additional sources referenced include: Andrew, M.E. et al. (2014) *Protected areas in boreal Canada: A baseline and considerations for the*

*continued development of a representative and effective reserve network.* Environmental Reviews 22:135-160. Badiou, P. et al. (2013) *Conserving the World's Last Great Forest Is Possible: Here's How.* A science/policy briefing note issued under the auspices of the International Boreal Conservation Science Panel and associates. URL: <http://borealscience.org/wp-content/uploads/2013/07/conserving-last-great-forests1.pdf>. Brandt, J.P. (2009) *The extent of the North American boreal zone.* Environmental Reviews 17: 101-161. Brandt et al. (2013) *An introduction to Canada's boreal zone: ecosystem processes, health, sustainability, and environmental issues.* Environmental Reviews 21: 207-226. Ecological Stratification Working Group (1995) *A National Ecological Framework for Canada.* Agriculture and Agri-Food Canada, Research Branch, Centre for Land and Biological Resources Research and Environment Canada, State of the Environment Directorate, Ecozone Analysis Branch, Ottawa/Hull. Murray, D.L. et al. (2015) *Potential pitfalls of private initiatives in conservation planning: A case study from Canada's boreal forest.* Biological Conservation 192: 174-180. Price, D.T. et al. (2013) *Anticipating the consequences of climate change for Canada's boreal forest ecosystems.* Environmental Reviews 21: 322-365. Schindler, D.W. et al. (2012) *The rapid eutrophication of Lake Winnipeg: Greening under global change.* Journal of Great Lakes Research 38: 6-13. Venier,

L.A. et al. (2014) *Effects of natural resource development on the terrestrial biodiversity of Canadian boreal forests*. Environmental Reviews 22: 457-490.

Wells, J.V. et al. (2013) *Ten Cool Canadian Biodiversity Hotspots: How a New Understanding of Biodiversity Underscores the Global Significance of Canada's Boreal Forest*. Boreal Songbird Initiative, Ducks Unlimited Inc., and Ducks Unlimited Canada, Seattle, Washington, Memphis, Tennessee, and Stonewall, Manitoba. Ricketts TH, Dinerstein E, Olson DM, Loucks C, Eichbaum W, DellaSala D, Kavanagh K, Hedao P, Hurley PT, Carney KM, Abell R, Walters S (1999) *Terrestrial Ecoregions of North America: A Conservation Assessment*. WWF Center for Conservation Biology. Washington, DC: Island Press.

Lee P, Hanneman M. (2010) *The Pimachiowin Aki World Heritage site planning area: Global and Canada boreal/taiga perspectives regarding key ecological criteria*. Global Forest Watch Canada 10th anniversary report #7. Winnipeg, MB: A report prepared for Pimachiowin Aki Corporation. [Included as Appendix G.2.3] of the nomination dossier, also available at [http://www.globalforestwatch.ca/files/publications/2012\\_0717A\\_Pimachiowin\\_Aki\\_WHS\\_PlanningArea.pdf](http://www.globalforestwatch.ca/files/publications/2012_0717A_Pimachiowin_Aki_WHS_PlanningArea.pdf).

Arsenault, D., and F. Maclaren. 2012. *Reinforcing the Authenticity and Spirit of Place of Indigenous Peoples to Promote Cultural Tourism at World Heritage Sites as a Development Approach: Learning from the Canadian Experience*. Paris: ICOMOS.

Lemelin, R.H., and N. Bennett. 2010. *The Proposed Pimachiowin Aki World Heritage Site Project: Management and Protection of Indigenous World Heritage Sites in a Canadian Context*. Leisure 34 (2): 169–87

**d) Consultations:** 9 desk reviews received including a multi-expert collated review. The mission undertook an extensive inspection of the property in the company of the Pimachiowin Aki Corporation (Board members, advisors and staff) and Parks Canada. It also consulted widely with representatives (Chiefs, Councillors, Elders and others) of the five Anishinaabe First Nations: Bloodvein River, Little Grand Rapids, Pauingassi, Pikangikum, and Poplar River; officials from the provinces of Manitoba and Ontario, and their respective provincial parks (Atikaki in Manitoba and Woodland Caribou in Ontario); and several lodge owners and operators. The mission also met with the Manitoba Provincial Premier and his Minister for Conservation and Water Stewardship.

**e) Field Visit:** Bastian Bertzky (IUCN) and Gregory de Vries (ICOMOS), 24-31 August, 2015

**f) Date of IUCN approval of this report:** April 2016

## 2. SUMMARY OF NATURAL VALUES

The nominated property, Pimachiowin Aki (meaning 'the Land that Gives Life'), encompasses c.3,340,000 hectares (ha) in the boreal forest biome and Canadian taiga biogeographical province. It is located east of Lake Winnipeg and along the provincial border of Manitoba and Ontario, Canada. It includes the Atikaki Provincial Park (IUCN Category II) in Manitoba, and

the Woodland Caribou Provincial Park (Category Ib) and Eagle-Snowshoe Conservation Reserve (Category II) in Ontario, which together form the southern quarter of the nominated area. The remainder of the area is "crown" or provincial land that comprises the ancestral lands of five Anishinaabeg First Nations communities (Pikangikum, Poplar River, Little Grand Rapids, Bloodvein River and Pauingassi). The property is surrounded by a buffer zone of 4,040,000 ha. The nomination has been submitted as a mixed property and cultural landscape, and the evaluation of values in relation to cultural criteria (iii) and (vi) has been undertaken by ICOMOS.

Pimachiowin Aki is in the centre of the North American boreal biome and forms the largest network of contiguous protected areas in the boreal shield ecozone (the largest ecozone in Canada). The property is characterized by boreal forests with relatively small trees, granite bedrock exposures, long free-flowing rivers and numerous lakes and wetlands. The Precambrian bedrock dates back 2 to 3 billion years. Erosion, volcanism, and continental glaciation have shaped the landscape. The most recent ice age produced the Laurentide Ice Sheet, the weight of which depressed the earth's crust. About 11,000 years ago, the nominated area was free of retreating ice but glacial melt formed Glacial Lake Agassiz in this depression, the largest post-glacial lake in the world, which lasted 4,000 years. Three main surface materials dominate the property: glacial till deposits, exposed bedrock, and organic and glacial lake mineral deposits. Water plays a dominant ecological and structural role with a highly complex, seemingly random and unpredictable drainage pattern – a result of continental glaciation and the variable surface materials. The topography, poor soil drainage and near surficial-bedrock create high water tables characterized by diverse wetland ecosystems, communities and complexes. The rivers flowing across Pimachiowin Aki provide ecological connectivity, nutrient transfer and, along with the numerous lakes, both dominate the landscape and are critical to the way in which this ecosystem functions, and also underpin indigenous people's cultural use of the landscape.

The property includes more than 5,600 lakes larger than 8 hectares, 8,000 smaller permanent freshwater marshes and pools, and nearly 41,000 kilometres of shoreline wetlands that provide important habitat for waterfowl, birds, amphibians, mammals and insects. Fire is a key ecological force and major natural agent of change, including at the landscape level, and there are two distinct fire regimes in the property. More frequent and extensive fires occur in the drier central and eastern areas, while extensive wetlands and Lake Winnipeg limit fires in the west. Fire frequency, intensity and patterns shape the landscape, vegetation type and forest age class, and play a major role in ecosystem processes (nutrient cycling, energy flow, soil fertility). Fires are also important to the way the landscape has been and continues to be used by the First Nations.

The property supports four different large-area ecosystems: needleleaf forest, wetland, rockland, and mixed wetland-rockland. Plant communities and species diversity (over 700 vascular plant species) are typical for boreal shield forests, with Black Spruce (LC), Jack Pine (LC) and Tamarack (LC) prevalent with birch and other hardwoods scattered where conditions warrant. The property includes both fens and bogs with plant communities dependent on depth-to-water. Extensive and diverse peat lands and Tamarack fens dominate in the western portion of the property where lacustrine and organic surficial materials prevail. Northern Wild Rice, an important traditional Native food source, is widespread naturally and as a result of indigenous aquaculture. It is also an important food source for waterfowl and other birds and animals.

The property supports most of the vertebrate species representative of the North American boreal shield: 43 mammals (80% of all boreal shield species), 220 birds (90%), 8 amphibians (100%) and 62 fish (67%). The property provides extensive areas of summer and winter range, along with critical calving “islands” (lake islands or upland areas in wetlands that inhibit predation) for Woodland Caribou, an indicator species with high sensitivity to human encroachment and that is listed as threatened in Canada. Moose are culturally significant and widespread (along with their primary predator, the Gray Wolf). In addition, American Black Bear, Wolverine, Canada Lynx, Red Fox, American Marten, American Mink, Fisher, Least Weasel, Snowshoe Hare, North American River Otter, North American Porcupine, American Beaver and Muskrat are all present (all mammals classified as Least Concern on the IUCN Red List of Threatened Species). Several of the 220 bird species are of conservation concern in Canada, and the Rusty Blackbird is globally classified as Vulnerable. Amphibians, reptiles and fish are present in typical abundance and distribution for the Canadian boreal shield, with Lake Sturgeon listed as endangered in Canada.

The mixed site nomination of this property reflects a 6,000 year history of the relationship of people with the land. The Anishinaabe First Nations continue a tradition of living in, using and maintaining the landscape, and the nature conservation values of Pimachiowin Aki are shaped by this long history of interaction. For example, the use of fire to open the forest canopy and favour certain natural resources, the manipulation of waterway channels and the effect of human fishing, hunting and gathering practices on the trophic dynamics of the ecosystem have all influenced the property's natural systems and processes. The Anishinaabe First Nations consider their culture to be inseparable from nature and the land: a cultural outlook that has shaped their belief systems.

### 3. COMPARISONS WITH OTHER AREAS

The new nomination contains a very strong, complete, accurate and comprehensive global comparative analysis, summarized in the main dossier and backed

up by several independent assessments of the global and regional significance of the property. While the nomination has sought to further strengthen the justification for criterion (ix) and the presentation of the comparative work, the underlying technical analysis has not changed significantly. The global comparative analysis considered 132 boreal sites worldwide, while a more detailed regional comparative analysis considered 13 sites in the North American boreal shield. All sites were evaluated based on a large number of well-defined indicators grouped into three themes that summarize critical attributes of boreal sites in relation to criterion (ix): 1) characteristic conditions, 2) large-area ecosystem diversity and 3) site integrity. The indicators used in the global analysis cover critical features and processes such as site size, intactness, surface materials, wildfire, hydrological complexity, carbon capture and storage, primary productivity and species diversity.

As the re-nomination notes “The [global] comparative analysis identified Wood Buffalo National Park (NP) and Pimachiowin Aki as the outstanding examples of the boreal biome biodiversity and ecological processes, with Wood Buffalo attaining a slightly higher score than Pimachiowin Aki. Wood Buffalo, located more than 1,000 kilometres northwest of the nominated property, was inscribed on the World Heritage List under criterion (ix) as ‘the most ecologically complete and largest example of the entire Great Plains-Boreal grassland ecosystem of North America.’” However, “Wood Buffalo and Pimachiowin Aki are located in different ecological zones (ecozones) within the North American boreal biome; they are starkly different in terms of geology, topography, drainage patterns, and vegetation patterns.” The nomination goes on to note: “The regional comparative analysis demonstrates that Pimachiowin Aki is outstanding in providing the very best example of natural features and ecological processes of the North American boreal shield ecosystem. Pimachiowin Aki attains the highest overall site score by a significant margin for all three themes evaluated, and it is the only site to have no extremely low score for any individual indicator.”

Above and beyond this, an additional comparative analysis was carried out for all remaining large, intact blocks of the North American boreal shield, treating these as hypothetical protected areas. Here, Pimachiowin Aki came out as the top ranked site overall, further supporting the argument that the property is the most significant protected area complex in the boreal shield.

The nomination includes a separate comparative analysis of the property's cultural heritage against 27 other sites within the North American Subarctic, based on a thematic framework with six themes. If anything, one could argue that a more integrated comparative analysis of natural and cultural heritage could have been attempted, but the nature-culture interactions are in part covered within the cultural comparative analysis and not dealt with in the natural analysis. This aspect is also dealt with in greater detail and strength in other sections of the dossier.

IUCN has further examined the comparative merits of Pimachiowin Aki. It is instructive to consider the context of the boreal biome worldwide. The circumpolar boreal zone is one of the world's major bioclimatic zones, covering much of North America and Eurasia with forests, woodlands, wetlands, lakes and rivers. The boreal biome covers over 15 million km<sup>2</sup> globally, or 11% of the total area of all 14 terrestrial biomes, but has only eight (<3.4%) of all the biodiversity World Heritage sites worldwide. This vast and important global biome is thus relatively under represented with less than 1% of the total area covered by biodiversity World Heritage sites. Contrary to widespread perception, these forests are far from being homogenous and typically contain a diverse mosaic of forest (sub) types, wetlands and other systems.

The Canadian boreal shield ecozone encompasses the area where the Canadian Shield and the boreal forest overlap. This ecozone, the largest in Canada, covers 12% of the total area of the boreal biome worldwide, and 20% of Canada's land area. The only existing natural World Heritage property in the Canadian boreal shield is Gros Morne NP on Newfoundland, which is inscribed under (vii) and (viii) and hence not for its ecosystem and biodiversity values. Furthermore, due to its island / maritime location, Gros Morne is very different from PA on many grounds, and, at 180,500 ha, it is also far too small to preserve the large-scale ecological processes and landscape dynamics that are characteristic in northern Canada. On the other hand, the 4,480,000 ha Wood Buffalo NP World Heritage site, inscribed under (vii), (ix) and (x), does not belong to the Canadian boreal shield but instead represents the boreal plain and taiga plain ecozones, and hence quite different ecosystem and biodiversity values.

According to the World Database on Protected Areas (WDPA), there are only two other existing large protected areas fully within the Canadian boreal shield that are bigger than 500,000 ha: Algonquin Provincial Park (PP) (770,000 ha) and Wabakimi PP (890,000 ha). In particular, the nearby Wabakimi PP shares many characteristics with Pimachiowin Aki, with an overall clearly lower ranking than Pimachiowin Aki according to the nomination's analysis, but both Wabakimi PP and Algonquin PP are far smaller than Pimachiowin Aki and also well below the minimum reserve size of 2,000,000 ha considered necessary to preserve ecological processes and landscape dynamics in northern Canada.

As noted in the previous IUCN evaluation, Pimachiowin Aki represents the globally important ecosystem values of the Canadian boreal shield ecozone, which are not yet represented in other biodiversity World Heritage sites. The comprehensive global and regional comparative analyses in the re-nomination of Pimachiowin Aki demonstrate that Pimachiowin Aki is by far the biggest and best example of them.

Analysis by IUCN and UNEP-WCMC, together with the data in the nomination, also shows that the species

diversity (not a primary focus of criterion (ix)) in Pimachiowin Aki is higher than, or comparable to, most other boreal World Heritage sites and includes the vast majority of the characteristic species of the boreal shield.

IUCN has also examined other mixed World Heritage sites which are Cultural Landscapes. As of July 2015, there were only seven mixed World Heritage sites on the List that are also recognized as Cultural Landscapes, and only three of them have been inscribed under criterion (ix): Ecosystem and Relict Cultural Landscape of Lopé-Okanda (Gabon), St Kilda (UK) and Papahānaumokuākea (USA). However, among the seven World Heritage sites, only Uluru-Kata Tjuta National Park (Australia), Tongariro National Park (New Zealand) and again Papahānaumokuākea (USA) stand out in terms of nature-culture interaction and the role of indigenous / aboriginal peoples. These properties may therefore provide useful analogues on these issues, although none of them is from the boreal biome. Compared to the seven sites mentioned above, the nominated property appears to be outstanding with regard to the driving and decisive role of indigenous peoples behind a mixed nomination, and this approach is something of an exception among World Heritage sites exhibiting strong associations between indigenous people and their land/seascapes.

It is worth recalling IUCN's 2013 evaluation was based on the analysis presented at the time and concluded that the evidence base failed to provide a compelling case for the property meeting criterion (ix) alone. The 2013 IUCN-ICOMOS advisory mission which followed the 2013 Committee meeting worked closely with the State Party and First Nation proponents confirming that (ix) was the appropriate natural criterion and that a stronger analysis could justify the case. In consequence, the comparative analyses in the dossier convincingly argue that Pimachiowin Aki is a globally significant example of the boreal biome, and the biggest and best example of the ecosystems and ecological processes of the North American boreal shield.

#### 4. INTEGRITY, PROTECTION AND MANAGEMENT

The Committee's attention is drawn to IUCN's 2013 evaluation of Pimachiowin Aki which provides an evaluation of many matters of integrity, protection and management which remain relevant to this re-nomination.

##### 4.1. Protection

IUCN recalls its 2013 evaluation which concluded that the protection status of Pimachiowin Aki as nominated then met the requirements of the Operational Guidelines. In essence, this view has not changed and some aspects of protection have been strengthened since the original nomination. The vast majority (c. 99.8%) of the property is protected under provincial parks legislation (applies to three provincial protected areas – Atikaki Provincial Park in Manitoba, and

Woodland Caribou Provincial Park and Eagle-Snowshoe Conservation Reserve in Ontario – and the designated protected areas in the Pikangikum First Nation planning area) or provincial legislation that recognizes the designated protected areas identified in the First Nation land use plans. Key pieces of legislation include the Provincial Parks Act (1993) and East Side Traditional Lands Planning and Special Protected Areas Act (2009) in Manitoba, and the Provincial Parks and Conservation Reserves Act (2006) and Far North Act (2010) in Ontario. The five First Nation settlements make up the remainder of the nominated area (c. 0.2%) and are covered by Canada's Indian Act.

Land tenure in the nominated area is a complex system of traditional Anishinaabe and Euro-Canadian tenure systems. All land is legally owned by the Crown (State) with the Crown obligated to uphold Aboriginal and Treaty rights. Daily decisions related to the use of wildlife are guided by customary laws and the constitutional rights of First Nations people in Canada.

The entire nominated area is protected from all commercial logging, mining, and the development of hydroelectric power, oil and natural gas. Limited areas of the property permit small scale quarrying for essential construction and maintenance of an all-season road (East Side Road). Protection has further improved since the original nomination as peat mining is now prohibited throughout the nominated area and plans for a potential community-led forestry project in the Bloodvein River First Nation planning area (previously covering 2% of the nominated area) have been abandoned, elevating this small percentage of the proposed area to the same standard of protection as the remaining 98%.

Additional protection is provided by extensive buffer zones with complementary governance and management arrangements. Almost all around the property, there is very high landscape connectivity and integrity, with no noticeable difference between areas inside or outside the property.

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

## 4.2 Boundaries

The property includes all elements necessary to express its Outstanding Universal Value under criterion (ix) and is of adequate size to ensure the complete representation and long-term conservation of critical features and processes. It is the most complete and largest protected area network in the North American boreal shield, including its characteristic biodiversity, and fully supports essential ecological processes such as wildfire, species movements, and predator-prey relationships. Moreover, Pimachiowin Aki represents three third-order watersheds, with approximately 80% of the headwater areas for two of these watersheds included within the nominated area.

The boundaries were defined through a community-led land use planning process and remain unchanged from the original 2012 nomination. IUCN recalls its concerns regarding the design of the boundaries in some parts of the nominated property, notably in the east, where the nominated area follows relatively narrow waterways and may compromise aspects of the ecological integrity. The ICOMOS and IUCN evaluators confirmed during the 2015 mission that important cultural sites are found throughout the nominated area but are especially evident along waterways. It is understood that the eastern boundaries extend out to encompass the upper reaches and headwater areas of main rivers in order to protect culturally significant waterways and associated terrestrial sites and also to enhance ecological connectivity and integrity. The boundaries include, within the nominated property, 'buffer areas' along all the waterways, which in turn are all connected. Whilst it would have been preferable for ecological integrity to include larger portions of the Whitefeather Forest Planning Area in this part of the nomination, the boundaries which have been defined nevertheless represent an adequate solution to ensure both the cultural and natural integrity of the nominated property. Furthermore the very large buffer zone area also provides an important component in achieving effective protection.

IUCN maintains its view that the boundaries of the nominated property display a number of shortcomings with respect to criterion (ix), but recognizes that the nomination is for a mixed site and that the evaluation needs to consider the interaction of nature and culture. IUCN's previous views that from an ecological integrity perspective it would be beneficial to consider the future addition of a number of areas which are not included in the nominated area, remain valid; for example, lands running to the shores of Lake Winnipeg in the west and surrounding upper watershed lands in the east. The community-based landuse planning approach taken is an appropriate and sustainable approach for the nomination, because it takes into account other parameters beyond solely examining the needs to protect biodiversity and ecosystems. Lastly, and crucially, IUCN and ICOMOS have in the specific case of this nomination been able to consider fully the approach to defining the boundaries, one which needs to reflect the interaction between nature and culture. On balance and given the overall size of Pimachiowin Aki, the boundaries, though remaining not ideal for criterion (ix), are considered by IUCN to represent an acceptable solution for the mixed site that has been nominated.

IUCN recognizes the reframing of this nomination and the additional evidence of cultural values linked to the property's waterways and thus considers the boundaries of the nominated property to be an acceptable solution in meeting the requirements of the Operational Guidelines.

### 4.3 Management

Pimachiowin Aki benefits from a well designed and developed governance system that involves, through the Pimachiowin Aki Corporation (PA Corporation) established in 2006, all seven partners (five First Nations, and Manitoba and Ontario provinces) in joint decision-making by consensus. Anishinaabe leadership and customary governance play a key role in the governance and management of the nominated property. However, the Corporation will be accountable for conserving, protecting and presenting the Outstanding Universal Values of the property should it be inscribed. The State Party provided additional information in September 2015, elaborating on the governance arrangements for the property including the mechanics of consensus processes and how development proposals are managed to ensure appropriateness and mitigate negative environmental impacts. Through its consensus-based, participatory governance structure, the arrangements appear well placed to address potential conflicts between any of the Pimachiowin Aki partners.

The nominated property is able to draw upon staff from all partners including the PA Corporation Secretariat, Board of Directors and advisors; park managers, specialists, wardens and biologists for the three provincial protected areas; Elders, head trappers, land coordinators and land guardians / river stewards in the First Nation areas; and joint First Nation / provincial government planning teams consisting of land planners, land coordinators and conservation officers. The joint planning teams have been operating for more than five years in each of the First Nation planning areas and lead the day-to-day implementation of the land and park management plans across the property.

As noted in IUCN's 2013 evaluation, Pimachiowin Aki has a management plan tailored to World Heritage in the event of inscription. This plan, last updated in December 2014, provides an appropriate framework which umbrellas a range of planning instruments applying across the property. The plan identifies strategic priorities, staffing levels, programs and financial projections for the initial 10 years of operation of a World Heritage site and integrates customary governance, legislative and institutional arrangements across the nominated area.

Adequate funding for the protection and management of the property has in the past been provided by Manitoba and Ontario Provinces, the First Nations, and the PA Corporation. Diverse sources of funding are available for the property from Government, via charitable donations which the PA Corporation is set up to receive, and from a permanent conservation endowment fund which needs further contributions to reach its CAD 20 million target.

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

### 4.4 Community

The Pimachiowin Aki nomination as a mixed site and Cultural Landscape reflects patterns of traditional use (fishing, gathering, hunting and trapping) and veneration of specific sites by the Anishinaabe First Nations which have developed over millennia through adaptation to the dynamic ecological processes of the boreal forest. These uses are important elements of the re-nomination and appear to be ecologically sustainable. The mixed property intentionally includes the settlements of the five First Nations (ranging from c. 600 to c. 2600 inhabitants), which together make up a tiny percentage (c. 0.2%) of the property. Only the five First Nations, along with essential social and other government services, reside in the property throughout the year.

A process of remarkable long term collaboration has marked the nomination process and ensures long term joint stewardship of Pimachiowin Aki. It should be noted that the five Anishinaabe First Nations themselves decided in their 2002 First Nations Accord to pursue a World Heritage nomination as a means to 'protect' their cultural values and traditions, together with their ancestral homeland. As the 2013 IUCN evaluation noted, "from the discussions with the First Nations during the evaluation mission it became evident that they consider the nominated property to be among the last remaining areas that may still support their traditional way of life."

As outlined above the governance and management of the property enshrines a collaborative and fully empowered approach.

### 4.5 Threats

The property is highly intact and largely free from the adverse effects of past (and present) development and neglect. It is considered one of the last remaining large ecologically intact portions of the southern boreal forest, which has otherwise been heavily fragmented by industrial forestry and other types of development. As noted in the nomination, the whole of the nominated area has never been subject to commercial resource developments such as forestry, mining, or hydroelectric projects, and commercial resource harvests have been limited to fur-bearing mammals, fish, and a very limited amount of wild rice. The very limited infrastructure present in the property includes some local power lines, seasonally functional winter roads (some to be decommissioned in the future), and the all-season East Side Road on the western side of the property.

Commercial logging and/or mining could potentially occur in parts of the property's buffer zone, in line with the First Nations land use plans and applicable federal / provincial legislation. A community-led commercial forestry operation is proposed for the Whitefeather Forest Planning Area of Pikangikum First Nation, but is expected to have no adverse effect on the cultural and natural values of the property if well implemented. The previous IUCN evaluation had already noted that, although there is no proposed mining within the buffer

zones at present, there are some areas with mineral potential. It is clear that any commercial developments will have to be carefully managed and monitored to avoid potential impacts on the values and integrity of the property. This is especially true around the boundary interfaces of the property. The past threat from the potential development of a big hydro power corridor has been averted as the corridor has definitely been re-routed to the western side of Lake Winnipeg. As noted under section 4.2, the evaluation has imparted some concerns regarding the linear watercourse boundaries in the east and the large boundary to surface area ratio that traditionally creates problems for protected areas. It is important that future community-led landuse planning decisions do not threaten the natural values in this area. Effective watershed protection requires a holistic approach for sensitive management of the entire catchment.

Other important current and future threats are associated with road development and anthropogenic climate change. The new all-season East Side Road is under construction in Manitoba on the western side of the property. This road will, for the first time, provide much needed year-round road access to the communities of the Bloodvein, Berens River, Poplar River, Pauingassi and Little Grand Rapids First Nations. Over time it is proposed to largely replace the existing winter road network that dissects the property in some areas and to reduce the overall road length inside the property. There will be no through traffic on the East Side Road. Mixed views exist among the communities as to the potential socio-economic and environmental impacts of the road but overall there is a clear demand for this access upgrade. Road construction reportedly follows a high standard of environmental assessment and review under federal guidelines, which is designed to mitigate negative impacts. It will be essential that further developments include a specific assessment of impacts on the nominated property, and ensure no negative impact on its outstanding value.

Climate change is an important potential threat to boreal forest ecosystems and hence some of the values and features of Pimachiowin Aki. Impacts could have profound ecological consequences, including altered wildfire regimes and more frequent and/or intense outbreaks of insect pests. Impacts need careful monitoring and adaptive management approaches. The vast size, extensive north-south extent, high intactness, and good connectivity of the property and its surrounding areas are considered to make it comparably resistant and resilient to climate change impacts, and to facilitate climate change adaptation.

Tourism, especially 'ecocultural' tourism, is seen as a potential opportunity for sustainable development in the property and parts of its buffer zone. However, due to its remoteness, wilderness character, difficulty and high cost of access and transport, the regulations in place, and the very limited tourism infrastructure, Pimachiowin Aki is certainly not suitable for mass tourism. At present, parts of the property are used for well-regulated, recreational fishing and hunting

tourism, and 'wilderness' canoeing is popular on all the main rivers. Fishing and hunting tourism is concentrated around very few, sparsely scattered tourism facilities, especially expensive fly-in lodges. Total annual visitation is estimated to be between 7,000 and 10,000 visitors at present, and this number is unlikely to increase drastically even if the property is inscribed.

In summary, the nomination process has benefited from the joint work of the First Nations, the State Party, concerned Provinces and other stakeholders, and the opportunity to consult with the Advisory Bodies to conceptually reframe the mixed property despite the constraints of the current World Heritage criteria and separate evaluation processes. The nominated property has also benefited from a deeper analysis and evaluation consulting a wider expert review base. This process has been also an important catalyst and learning opportunity for the approach to nature/culture interactions in the work of IUCN and ICOMOS within the World Heritage Convention.

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

## 5. ADDITIONAL COMMENTS

IUCN, in collaboration with the State Party, First Nations, ICOMOS and others, was pleased to be able to contribute advice on the nomination in the full spirit of the World Heritage Convention's upstream process, and in a dialogue that has involved at all stages the First Nations, local government and State Party experts. Despite, or perhaps because of the protracted evaluation process, this dialogue has advanced the thinking and evaluative practices of IUCN and ICOMOS concerning nominations of sites for their nature/culture interactions, and has been a catalyst for a renewed and growing joint approach to the links between nature and culture in the World Heritage Convention involving all of the Advisory Bodies, the World Heritage Centre and a growing range of partners. This is a legacy for the Convention from the nomination of Pimachiowin Aki that goes beyond the individual nomination concerned. The nomination also has a particular importance in the exemplary way it has come forward, via the State Party, as the initiative of the five First Nations. Its long-term significance for the work of the Convention lies also in its lessons about empowering indigenous peoples to determine their own priorities for conservation, which is of even greater relevance considering the adoption of the new Sustainable Development Policy and the recognition of the rights and role of indigenous peoples in the Convention's Operational Guidelines.

## 6. APPLICATION OF CRITERIA

**Pimachiowin Aki** has been nominated under natural criteria (ix), as well as under cultural criteria (iii) and (vi) which will be evaluated by ICOMOS.

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

Pimachiowin Aki is the most complete and largest example of the North American boreal shield, including its characteristic biodiversity and ecological processes. Pimachiowin Aki contains an exceptional diversity of terrestrial and freshwater ecosystems and fully supports wildfire, nutrient flow, species movements, and predator-prey relationships, which are essential ecological processes in the boreal forest. Pimachiowin Aki's remarkable size, intactness, and ecosystem diversity support characteristic boreal species such as Woodland Caribou, Moose, Wolf, Wolverine, Lake Sturgeon, Leopard Frog, Loon and Canada Warbler. Notable predator-prey relationships are sustained among species such as Wolf and Moose and Woodland Caribou, and Lynx and Snowshoe Hare. Traditional use by Anishinaabeg, including sustainable fishing, hunting and trapping, is also an integral part of the boreal ecosystems in Pimachiowin Aki.

IUCN considers that the nominated property meets this criterion.

**7. RECOMMENDATIONS**

IUCN recommends that the World Heritage Committee adopts the following draft decision, noting that this will be harmonised as appropriate with the recommendations of ICOMOS regarding their evaluation of this mixed site nomination under the cultural criteria and included in the working document WHC/16/40.COM/8B:

The World Heritage Committee,

1. Having examined Documents WHC/16/40.COM/8B et WHC/16/40.COM/INF.8B2;

2. Inscribes Pimachiowin Aki (Canada) on the World Heritage List under natural criterion (ix);

3. Adopts the following Statement of Outstanding Universal Value:

**Brief synthesis**

*Pimachiowin Aki (the Land that Gives Life) is a 3,340,000 hectare cultural landscape of Anishinaabeg (Ojibwe people). Through the cultural tradition of Ji-ganawendamang Gidakiiminaan (Keeping the Land), Anishinaabeg have for millennia lived intimately with this special place in the heart of the North American boreal shield. Pimachiowin Aki is a vast area of healthy boreal forest, wetlands, lakes, and free-flowing rivers. Waterways provide ecological connectivity across the entire landscape. Wildfire, nutrient flow, species movements, and predator-prey relationships are key, naturally functioning ecological processes that maintain an impressive mosaic of ecosystems. These ecosystems support an outstanding community of boreal plants and animals, including iconic species such as Woodland Caribou, Moose, Wolf, Wolverine, and Loon.*

**Criteria****Criterion (ix)**

*Pimachiowin Aki is the most complete and largest example of the North American boreal shield, including its characteristic biodiversity and ecological processes. Pimachiowin Aki contains an exceptional diversity of terrestrial and freshwater ecosystems and fully supports wildfire, nutrient flow, species movements, and predator-prey relationships, which are essential ecological processes in the boreal forest. Pimachiowin Aki's remarkable size, intactness, and ecosystem diversity support characteristic boreal species such as Woodland Caribou, Moose, Wolf, Wolverine, Lake Sturgeon, Leopard Frog, Loon and Canada Warbler. Notable predator-prey relationships are sustained among species such as Wolf and Moose and Woodland Caribou, and Lynx and Snowshoe Hare. Traditional use by Anishinaabeg, including sustainable fishing, hunting and trapping, is also an integral part of the boreal ecosystems in Pimachiowin Aki.*

**Integrity**

*Pimachiowin Aki contains all the elements necessary to ensure continuity of the key ecological processes of the boreal shield. The robust combination of First Nation and provincial protected areas forms the largest network of contiguous protected areas in the North American boreal shield. The vast size of the property provides for ecological resilience, especially in the context of climate change, and extensive buffer zones further contribute to integrity. The natural values of Pimachiowin Aki are remarkably free from the adverse effects of development and neglect. There is no commercial forestry, mining, or hydroelectric development permitted in the property, and waterways are free of dams and diversions.*

*The configuration of the property's boundary is a product of its mixed natural and cultural heritage. Ecological integrity could be further enhanced through the progressive addition of areas of high conservation value adjacent to the currently inscribed property.*

**Protection and Management requirements**

*First Nations have played the leading role in defining the approach to protection and management of Pimachiowin Aki. Protection and management of the property is achieved through Anishinaabe customary governance, grounded in Ji-ganawendamang Gidakiiminaan, contemporary provincial government law and policy, and cooperation among the five First Nations and provincial government partners. Through an accord signed by the five First Nations, Anishinaabeg of Pimachiowin Aki affirmed a sacred trust to care for the land for future generations. A memorandum of agreement between the provincial governments provides assurances about protection and management of the property. The Pimachiowin Aki partners share a commitment to work together to safeguard the Outstanding Universal Value of Pimachiowin Aki for present and future generations.*

*First Nations and provincial partners have created the Pimachiowin Aki Corporation and developed a consensual, participatory governance structure, financial capacity, and a management plan for the property. The Pimachiowin Aki Corporation acts as a coordinating management body and enables the partners to work in an integrated manner across the property to ensure the protection and conservation of all natural values. The management framework is designed to meet potential challenges in the protection and conservation of the property, such as monitoring and mitigating the potential impacts of the construction of an all-season road [East Side Road] over the next 20 to 40 years. Climate change is also a challenge that requires adaptive management. A conservation trust fund has been set up to secure long-term sustainable financing for the management of the property.*

4. Commends the efforts and achievements of the State Party and First Nations supporting the nomination to address the recommendations of the UNESCO World Heritage Committee, including improving the quality of the comparative analysis which, in terms of its overall approach and comprehensiveness, could potentially serve as a model for such analysis in relation to criterion (ix), and for adopting significant measures to ensure the conservation and protection of the property;

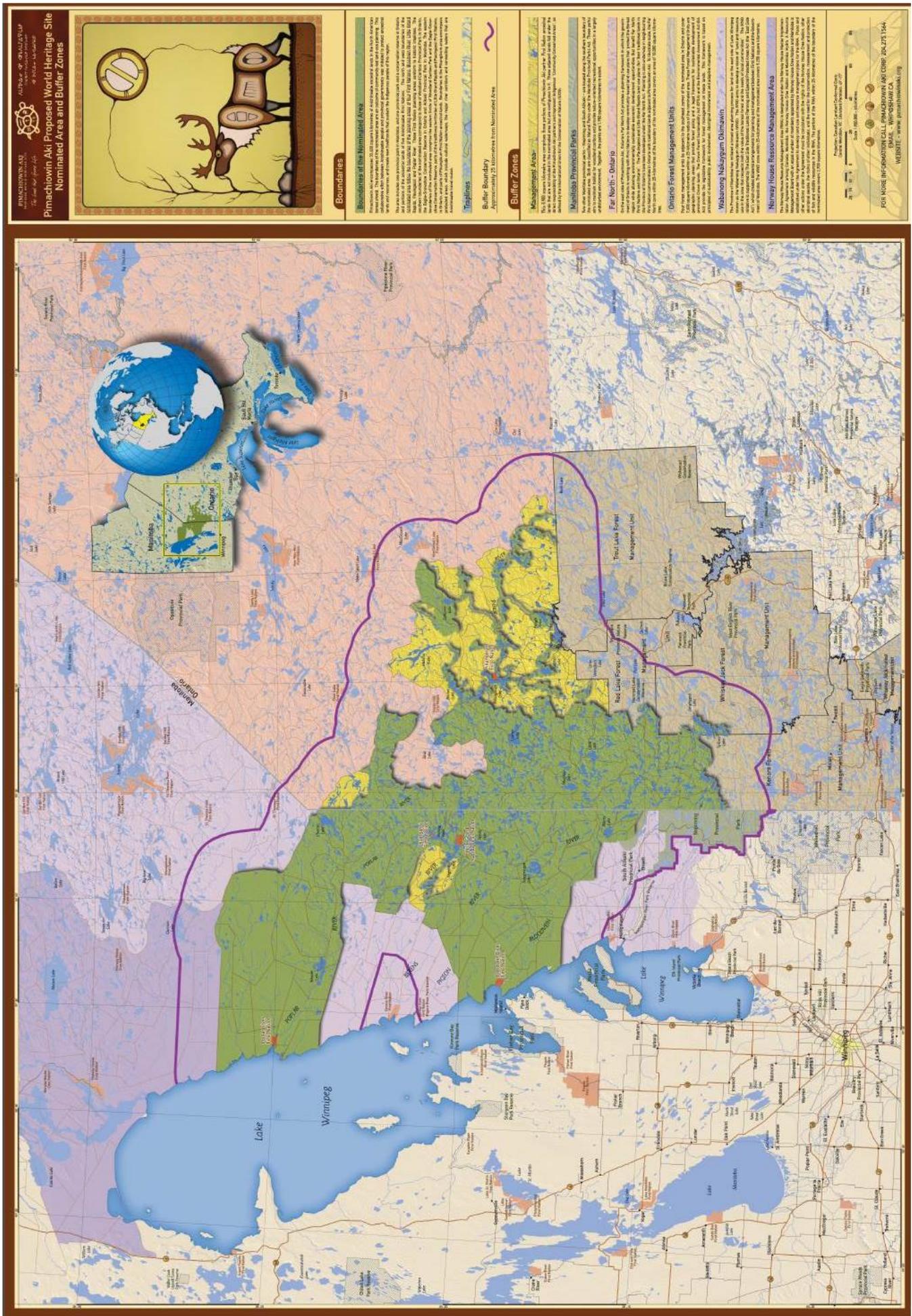
5. Requests the State Party in collaboration and with the consent of the First Nations to:

- a) Consider the possibility of further extensions of the property over time, such as for example the addition of the Berens River First Nation areas, located to the West of the property, in order to further improve the ecological connectivity and integrity of the property.

- b) Carefully monitor activities being carried out in the buffer zone to the East of the property, and ensure that any future potential new developments, such as logging, are carried out in a sustainable way in line with the procedures of the Operational Guidelines, and do not compromise the Outstanding Universal Value of the property.
- c) Ensure that the construction of the new all-season road does not have adverse effects on the property, notably by carrying out full environmental impact assessments at each future phase of the road construction and through effective monitoring of any ongoing impacts.

6. Expresses its appreciation for the combined efforts of the State Party and First Nations, and all the stakeholders in the site, and for the joint dialogue undertaken with IUCN and ICOMOS, in deepening the understanding of nature-culture connections in the context of the World Heritage Convention, and for presenting a revised nomination which is a landmark for properties nominated through the commitment of indigenous peoples and to demonstrate how the indissoluble bonds that exist in some places between culture and nature can be recognized on the World Heritage List.

Map 1: Nominated property and buffer zone



## **C. CULTURAL PROPERTIES**

### **C1. NEW NOMINATIONS OF CULTURAL PROPERTIES**



**ASIA / PACIFIC**

**ZUOJIANG HUASHAN ROCK ART CULTURAL LANDSCAPE**

**CHINA**



## **WORLD HERITAGE NOMINATION – IUCN COMMENTS TO ICOMOS**

### **ZUOJIANG HUASHAN ROCK ART CULTURAL LANDSCAPE (CHINA)**

IUCN provides the following brief comments to ICOMOS based on a review of the nomination by the World Heritage Panel, and four desk reviews. No field mission was undertaken and no questions from ICOMOS were received where particular points were requested to be considered.

The nomination is a serial proposal with three different component parts making up a total of a small overall (6,600 ha) site. The nominated area overlaps with territory in protected areas for nature conservation, and may include nature conservation values of international importance, including for threatened species. The nomination has no information on the nature conservation values included in the nominated areas, and thus it is recommended that ICOMOS should seek more information on those values, and if there is effective conservation of them.

The nomination does not appear to be well configured as a cultural landscape, with a focus only on rock art as a central interest, and not clearly on a consideration of the interaction between nature and people at landscape scale. It is not clear to IUCN that the conservation of the natural values of the nominated property are likely to be addressed via the nomination presented, so a complementary mechanism such as the UNESCO Man and Biosphere Programme may have merits and should be considered.



**ASIA / PACIFIC**

**PHU PHRABAT HISTORICAL PARK**

**THAILAND**



## **WORLD HERITAGE NOMINATION – IUCN COMMENTS TO ICOMOS**

### **PHU PHRABAT HISTORICAL PARK (THAILAND)**

IUCN provides the following brief comments to ICOMOS based on a review of the nomination by the World Heritage Panel, and two short desk reviews. No field mission was undertaken and no questions from ICOMOS were received where particular points were requested to be considered.

The nomination is a serial proposal with two component parts making up a total of a small overall (869 ha) site, with a large 30,000 ha buffer zone.

The nomination does appear to contain an area founded on conservation of a human response to the natural environment. The area nominated and the buffer zone overlap with protected areas for nature conservation and the nomination describes biodiversity values, including limited information on species that occur within the nominated area. It would be appropriate for more attention to be given to the conservation of biodiversity in the nomination, and for this to be fully considered as part of the implementation of the management system for the property in the future. Care should also be taken to verify that the prescriptions set out in the nomination for the protection of the environment are capable of implementation, since some may be ambitious relative to available staff and resources.



**EUROPE / NORTH AMERICA**

**ANI CULTURAL LANDSCAPE**

**TURKEY**



## **WORLD HERITAGE NOMINATION – IUCN COMMENTS TO ICOMOS**

### **ANI CULTURAL LANDSCAPE (TURKEY)**

IUCN provides the following brief comments to ICOMOS based on a review of the nomination by the World Heritage Panel, and 4 desk reviews. No field mission was undertaken and no questions from ICOMOS were received where particular points were requested to be considered.

The nomination is a small site (250 ha) with a small buffer zone (292 ha).

The nomination contains a clear description of biodiversity values, which are notable at the national level. The area is not protected for its nature conservation values, including an inventory of threatened species. The area nominated is considered by reviewers to be too small to conserve significant biodiversity over time.

The location of the nominated area on a triangular promontory appears to be the main human-nature interaction within the nomination as put forward, but the boundaries in the wider landscape exclude key landscape features, for instance bisecting river valleys, which tend to weaken justification of the area proposed for inscription as representing the combined works of nature and of people. Whilst not commenting on cultural value, IUCN would have doubts that the nomination as proposed is a cultural landscape, in the terms of the Operational Guidelines, due to its small size and the exclusion of the surrounding natural/semi natural landscape around the nominated property.

IUCN further notes that following discussion with ICOMOS, the State Party decided to change the category of the property and it is now not a cultural landscape anymore but an archaeological site. IUCN concurs with that assessment and change to the nomination.







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