

LATIN AMERICA / CARIBBEAN

BLUE AND JOHN CROW MOUNTAINS

JAMAICA



Blue Mountain National Park - © IUCN Tilman Jaeger

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

BLUE AND JOHN CROW MOUNTAINS (JAMAICA) – ID No. 1356 Rev

IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE: To inscribe the property under natural criterion (x).

Key paragraphs of Operational Guidelines:

Paragraph 77: Nominated property meets World Heritage criterion (x).

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

Background note: A larger property, Blue and John Crow Mountains National Park (BJCMNP), was nominated in 2010 and evaluated in 2011 as a mixed property according to criteria (iii), (vi), (ix) and (x). Whilst noting the high potential of Jamaica to demonstrate globally significant biodiversity, the IUCN recommendation at that time was to not inscribe the nominated property. Concerns were raised regarding lack of adequate comparison with the Cockpit Country Forest Reserve and on integrity issues, particularly in the disturbed lower elevations of the national park. In 2011 the Committee decided to defer the nomination under both natural and cultural criteria to allow the State Party to address major integrity concerns, undertake a fuller assessment of the potential of the Cockpit Country Forest Reserve and bring back a new nomination with the strongest potential for inscription onto the World Heritage List (Decision 35COM 8B.16).

The Committee's attention is drawn to IUCN's 2011 evaluation of the larger BJCMNP (Decision WHC 11-35com-inf.8B2). References to this earlier nomination and evaluation are dated 2011 for simplicity.

1. DOCUMENTATION

a) Date nomination received by IUCN: 18 March 2014

b) Additional information officially requested from and provided by the State Party: IUCN wrote to the State Party on 22 December, 2014 following the World Heritage Panel. The letter requested an update of data on key species to clarify the viability of populations remaining within the nominated property; clarifications on zoning; clarification on measures to address threats from buffer zone uses; and commitments to sustainable financing of the nominated property. In cooperation with ICOMOS, IUCN has maintained an ongoing dialogue with the State Party. A written response was received on 26 February 2015 to the issues raised.

c) Additional literature consulted: Various sources, including Bubb, P., May, I., Miles, L., Sayer, J. (2004) **Cloud Forest Agenda**. UNEP-WCMC, Cambridge, UK. Grubb, P.J. and Tanner, E.V.J. (1976). **The Montane Forests and Soils of Jamaica: A Reassessment**. Muchoney, D.M., Iremonger, S., Wright, R. (1994). **A Rapid Ecological Assessment of the Blue and John Crow Mountains National Park, Jamaica**. The Nature Conservancy/JCDT. BirdLife International (2014). **Important Bird Area Factsheet: Blue Mountains and John Crow Mountains and Endemic Bird Area Factsheet: Jamaica**. Downloaded from <http://www.birdlife.org>. Accessed October 2014. Scott Dunkley C. and Barrett S. (2001) **Case Study of the Blue and John Crow Mountains National Park, Jamaica**. Caribbean Natural Resources Institute. CANARI Technical Report N° 282. WWF (2006). **WildFinder: Online**

database of species distributions: Jamaican moist forests.

Downloaded from www.worldwildlife.org/WildFinder, ver. Jan-06. Accessed October 2014. WWF (2014) **List of ecoregions: Greater Antillean Moist Forests**. Downloaded from http://www.panda.org/about_our_earth/ecoregions/ecoregion_list/. Accessed October 2014. Synge, H. (1991). **Which Oceanic Islands merit World Heritage status? A short feasibility study for IUCN**. IUCN, Gland Switzerland. Anadón-Irizarry V., et al. (2012). **Sites for priority biodiversity conservation in the Caribbean Islands Biodiversity Hotspot. Key Biodiversity Area Special Series**. Journal of Threatened Taxa: 4(8): 2806–2844. www.threatenedtaxa.org. Bertzky B et al. (2013). **Terrestrial Biodiversity and the World Heritage List: Identifying broad gaps and potential candidate sites for inclusion in the natural World Heritage network**. IUCN, Gland, Switzerland and UNEP-WCMC, Cambridge, UK. BirdLife (2009) **Jamaica Country Profile** in Devenish C, Díaz Fernández DF, Clay RP, Davidson I, Yépez Zabala I (Eds). **Important Bird Areas Americas - Priority sites for biodiversity conservation**. Quito, Ecuador: BirdLife International (BirdLife Conservation Series No. 16). Chai SL, Tanner E (2010) **Are We Losing the Best Parts of Our Protected Areas in Tropical Mountains?** Biotropica. Chai SL, Tanner E, McLaren K (2009) **High rates of forest clearance and fragmentation pre- and post-National Park establishment: The case of a Jamaican montane rainforest**. Biological Conservation 142: 2484–2492. Davis, S.D., Heywood, V.H., Herrera-MacBryde, O., Villa-Lobos, J., Hamilton, A. (eds.). (1997) **Centres of Plant Diversity: A Guide and Strategy for Their Conservation. Volume 3: The Americas**. IUCN,

Cambridge, U.K. Evelyn O.B., Camirand, R. (2003) **Forest cover and deforestation in Jamaica: an analysis of forest cover estimates over time.** International Forestry Review 5(4): 354-363. Protected Areas Committee (2009) **Jamaica's National Ecological Gap Assessment Report.** A component of the Protected Areas System Master Plan of Jamaica. Sutton A, Dorfman D (2007) **Jamaica - A Terrestrial Ecoregional Assessment. First Draft.** The Nature Conservancy.

d) Consultations: 6 desk reviews received including reviews received at the time of the 2011 evaluation. The mission also met with the Minister of Youth and Culture, representatives of Ministries of Tourism and Entertainment, Water, Land, Environment and Climate Change, National Environment and Planning Agency (NEPA), Institute of Jamaica (IOJ), Jamaica Conservation and Development Trust (JCDDT), Jamaica National Heritage Trust (JNHT), Tourism Enhancement Fund (TEF), Jamaica National Commission for UNESCO (JNC-UNESCO), Forestry Department of Jamaica, The African Caribbean Institute of Jamaica/Jamaica Memory Bank, The Nature Conservancy, Jamaica Intellectual Property Office, Ministry of Foreign Affairs and Foreign Trade (MFAFT), Natural Resources Conservation Authority (NRCA). The mission also met with Maroon Colonels and various community representatives. In addition the mission consulted with the University of the West Indies (UWI), University of Technology and the Old Tavern Coffee Estate. Additional consultations took place with Professor Ed Tanner (University of Cambridge) prior to the mission.

e) Field Visit: Tilman Jaeger and Melissa Marin (IUCN) and Liana Muller (ICOMOS), 27 October to 02 November 2014

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

2. SUMMARY OF NATURAL VALUES

The Blue and John Crow Mountains, located in the eastern part of Jamaica within the Caribbean, cover approximately 20% of the island's total landmass. The property, Blue and John Crow Mountains (BJCM), is a subset of the larger mountain system and has been nominated under cultural and natural criteria. IUCN's evaluation focuses on the natural values, whilst evaluation in relation to cultural World Heritage criteria is being carried out by ICOMOS.

Jamaica is the third largest island in the Greater Antilles in the Western Caribbean and is known for a particularly high degree of endemism in terrestrial and freshwater ecosystems. For example, there are 27 endemic reptile species and 20 endemic amphibian species along with more than 500 land snail species. Jamaica is among the world's islands with the highest percentage of endemic plant species. The remnants of moist forests of the Greater Antilles are known for their distinctive flora and fauna, with numerous unique families, genera and species. As a function of the rugged terrain, the nominated area is among the last

remaining areas of contiguous natural forest in Jamaica and the Caribbean.

Two major mountainous units dominate the interior of the island, the Main Block and the Eastern Mountain Mass. The nominated area is located in the latter, just north of the capital Kingston in the county of Surrey. The Eastern Mountain Mass comprises three distinct mountain ranges and the higher elevations of the Blue Mountains and John Crow Mountains constitute the revised nominated area. Overall, the size and design of both the nominated area and the buffer zone have been changed significantly compared to the 2011 nomination. The revised nominated area can be described as the core of the BJCM National Park and covers approximately 26,251 ha (versus some 48,650 ha in 2011) with a buffer zone of now 28,494 ha. The nominated property is restricted to higher elevations (850 - 2,256m asl) and the reduction from the previous nomination is, in essence, a focus on the more intact forest areas which are largely correlated with altitude and ruggedness of terrain. The outer boundary of the proposed World Heritage buffer zone coincides with the boundaries of the national park and in addition includes a large part of the upper and middle Rio Grande Valley.

The two ranges jointly comprising the nominated area are distinct in many ways. The Blue Mountains are Jamaica's highest range, peaking at around 2,250 m., with several other peaks above or close to 2,000 m. Rapid uplift has resulted in exceptionally rugged terrain with steep slopes and major altitudinal gradients. The John Crow Mountain system, in contrast, is a limestone plateau peaking at 1,140 m.

The geological history of both mountain ranges and the wide range of conditions (altitude, exposition, rock chemistry, micro-climate, human use, etc.) are considered to have resulted in the greatest diversity of ecosystems and habitats found in Jamaica.

Most of the nominated property is covered in closed forests of various types. In contrast, large areas of the buffer zone have been deforested and are today a mosaic of subsistence and commercial agriculture, the latter often in monoculture, and fallow areas often covered by invasive species and ineffectively managed pine plantations with patches of natural regeneration of both native and non-native species.

The nominated property and the section of its buffer zone located within the National Park and Forest Reserve are tropical, montane rainforest much of which is cloud forest between the elevation levels within the property. The high elevation, rugged landscape and the north and south-facing slopes of the mountains have resulted in a wide variety of habitat types with 9 natural communities within the upper montane forest of the Blue Mountains (over 1,000m) and John Crow Mountains (over 600m). These include a unique Mor Ridge Forest characterised by a deep layer (50 cm) of acidic humus with bromeliads on the ground and endangered tree species. Above 1,800m, the vegetation of the Blue Mountains is more stunted with some species such as *Eugenia alpina* and *Clethra*

alexandra restricted to these altitudes. Above 2,000m the forest is known as Elfin Forest due to the stunted and gnarled appearance of the trees which are heavily coated with epiphytes including hanging mosses, ferns and tiny orchids.

The nomination dossier highlights the exceptional floral and faunal diversity and high degree of endemism within the higher elevation ecosystems. The flora of BJCM has not been fully surveyed, but according to the nomination file, over 600 species of flowering plants were recorded in 1993. Supplementary information received from the State Party significantly increased this figure to an estimated 1,357 flowering plants. The nominated property includes dense forest coverage with two main forest types represented: montane forest over shale in the Blue Mountain and wet limestone forest in John Crow Mountains. It also contains half of Jamaica's 530 fern species.

Despite the widely acknowledged natural values, limited taxonomic research has been conducted in the nominated area resulting in data deficiencies and a high likelihood of future discoveries, certainly as regards the invertebrate fauna and perhaps even a small number of vertebrate species (reptiles and/or amphibians) in seldom visited areas which are difficult to access. Native mammals are poorly represented in Jamaica with only one non-flying native species (a rodent known as Coney or Hutia) and a few bat species. Jamaica has, however, a noteworthy number of endemic bird, reptile and amphibian species. The State Party in its February 2015 supplementary information provided updated data on species numbers including rates of endemism. The information verifies that these species are known to exist within the upper elevations of BJCM, however, some of the deficiencies in the data noted above are also acknowledged. The nominated property is reported to contain 13 species of mammals; 101 birds (32 endemics); 13 amphibians (12 of which are endemic); 20 reptiles (18 endemics) and 8 species of fish. The property includes a significant number of Jamaica's endemic frog species, 12 have been recorded, many of them endemic and/or threatened. Several reptile species (1 turtle, up to 7 snakes and 16 lizards, according to the supplementary information) and 9 species of bat are also found. Importantly, BJCM provides a permanent or winter home to an estimated 220 resident and migrant bird species. It also provides habitats for many invertebrate species, including a high diversity of snails, velvet worms and aquatic invertebrates. The BJCM contains two of Jamaica's five Alliance for Zero Extinction sites, hosting a significant number of globally endangered species. The nominated property hosts a high number of globally threatened plant species included a reported 106 tree species. Threatened plant species include *Podocarpus urbanii* (CR), *Eugenia kellyana* (CR), *Psychotria danceri* (CR), *Schefflera stearnii* (EN), *Miconia pseudorigida* (EN), *Ardisia brittonii* (EN), *Carica jamaicensis* (VU), *Cinnamodendron cricosum* (VU), *Dendropanax blakeanus* (VU), *Hernandia catalpifolia* (VU), *Ilex puberula* Proctor (VU), *Ilex vaccinioides* Loes (VU), *Lunania polydactyla* (VU), *Rondeletia elegans* (VU), *Wallenia fawcettii* (VU),

Samyda glabrata (VU), and *Ternstroemia Howardiana* (VU). BJCM is also home to a very high number of threatened animal species including several frog and bird species. The Jamaican Rumpspot Frog, *Eleutherodactylus andrewsi* (EN), Arntully Robber Frog, *E. orcutti* (CR), and *E. nubicola* (EN) are exclusively found in BJCM. Regarding threatened avifauna, the Bicknell's Thrush, *Catharus bicknelli* (VU) and Jamaican Blackbird, *Nesopsar nigerrimus* (EN) are found, as well as the Yellow-billed Parrot, *Amazona collaria* (VU) and Black-billed Parrot, *Amazona agilis* (VU) in John Crow Mountains.

The previous IUCN evaluation concluded that BJCMNP had the "highest number of endemic land bird species among sites in the oceanic islands of the world" while also stressing its importance in migratory bird species both from the Northern and Southern Hemispheres.

3. COMPARISONS WITH OTHER AREAS

The natural values of the property are nominated in relation to criteria (ix) and (x). The nomination dossier provided a rather brief comparative analysis comparing BJCM with several similar World Heritage properties drawing conclusions, partly on its relative importance in terms of high levels of endemism, particularly among birds, reptiles, amphibians and invertebrates. The analysis compares BJCM favourably on the basis of its wide range of habitats supporting relatively high levels of species richness. The nominated property is an important centre for plant endemism in the Caribbean displaying 50% endemism in the flowering plants at elevations above 900-1000m with between 30-40% of these species being site specific. Much emphasis is placed on the nominated property featuring within an IUCN 2013 study showing its overlap with one of the world's 78 most irreplaceable protected areas, based on amphibian, bird and mammal species. It should be noted that the area referred to in this study was much larger than the nominated property. Supplementary information provided by the State Party notes that the nominated property consists of tropical, montane rainforest, much of which is cloud forest between 850m and 2,256m. Cloud forest has been described as "a rare habitat of tropical mountains" which "make up no more than 2.5% of the world's tropical forests" but harbouring "a disproportionately large number of the world's species" and being "even rarer in the America's forming 1.2% of the tropical forests".

Additional comparative analysis was provided by the State Party in the supplementary information of February 2015. This strengthens the original analysis providing tabular comparison with 4 other forested World Heritage properties, namely Morne Trois Pitons, Dominica; The Pitons, St Lucia; Alejandro de Humboldt, Cuba and Garjonay National Park in the Canary Islands, Spain. In addition comparison is made with the Cockpit Country in Jamaica. This provides a more convincing case for BJCM on relative species richness and endemism. The nomination did not assess the nearby Cockpit Country, however this

supplementary information confirms that the area is of comparable importance, but geologically and ecologically very distinct from BJCM, a view also supported by the field mission. Furthermore there are integrity and protection concerns related to the Cockpit Country. The area is subject to threats from plans to mine limestone, gypsum and bauxite and the status of Forest Reserve is considered a weaker protective designation.

IUCN's additional comparative analysis notes that the terrestrial biodiversity importance of the Caribbean is routinely based on the region's high degree of endemism. For example, almost three quarters of the roughly 11,000 plants and all 189 recorded native amphibians in the Caribbean are endemic and in terms of endemism at the genus level, it ranks third among the world's 35 Biodiversity Hotspots. Jamaica also featured prominently within a 1991 IUCN study on oceanic island systems worthy of World Heritage status, particularly based on levels of endemism (ranking 4th in terms of endemic plants behind New Caledonia, Hispaniola and Hawaii), and BJCM is a highly significant representation of Jamaica's biodiversity.

The additional IUCN analysis notes that the BJCM coincides with a bio-geographical province (Greater Antillean) and terrestrial eco-region (Jamaican Moist Forests), as well as an Endemic Bird Area and Centre for Plant Diversity, which are not yet represented on the World Heritage List. The site also exhibits an exceptionally high proportion of endemic plant and animal species as well as a number of globally endangered species, including several frog and bird species, and several species are believed to still be undergoing speciation. The BJCM has also been identified as a gap in representation of World Heritage sites: it belongs to a Centre of Plant Diversity and an Udvardy biogeographic province not yet represented on the List and as noted above it overlaps with one of 78 most irreplaceable protected areas in the world.

The Critical Ecosystem Partnership Fund in 2010 listed both the Blue Mountains and the John Crow Mountains (separately) as key biodiversity areas to be considered "wholly irreplaceable sites in the Caribbean Islands Hotspot". Jamaica has a noteworthy avifauna with some 300 recorded bird species, including 36 restricted-range endemics. The country's 15 Important Bird Areas (IBAs) cover some 21% of Jamaica's terrestrial territory and include both the Blue Mountains (23 out of 28 birds endemic to Jamaica) and the John Crow Mountains (27 out of 28 birds endemic to Jamaica).

4. INTEGRITY, PROTECTION AND MANAGEMENT

4.1. Protection

Formal conservation of the nominated property goes back to at least the late 19th Century when the then colonial government recognized the importance of the various watersheds in Jamaica's mountain ranges. As noted in IUCN's 2011 evaluation the site was legally

protected as a Forest Reserve in 1939, declared under the Forest Act of 1937. Established in 1993, BJCMNP is Jamaica's first and only national park. Key pieces of legislation applicable today include the Natural Resources (National Park) Act (1993) and its regulations; the Forestry Act (1996); the Natural Resources Conservation Authority Act (1991) and the Protected National Heritage under Jamaica National Heritage Trust Act (1985). Further legislation pertains to wildlife, endangered species, fire management, pollution and water resource management.

The nominated property is state-owned and sits within the boundaries of the national park thus enjoying a high standard of legal protection. The State Party has clarified that the area nominated aligns with the park's Preservation Zone, the highest protection level of the three zones in operation in the park and surrounding buffer zone (Preservation Zone, Recovery Zone and Community Buffer Zone).

The proposed buffer zone is also for the most part bounded by the national park with an additional Community Buffer Zone mentioned above providing a further surrounding layer. While the nominated property is compatible with IUCN Protected Area category II, most of the buffer zone clearly is not despite its formal National Park status. In addition, the nominated property lies within a forest reserve and is an area of "Protected National Heritage". Most of the buffer zone is stated to be publicly owned. The Rio Grande Valley, part of the buffer zone, but mostly outside of BJCMNP, is an exception as most of the land here is privately owned, including by members of the local Maroon community.

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

4.2 Boundaries

The boundaries of the area nominated in 2011 have been reviewed to reduce the area by some 46%. This has resulted in a property with a more intact forest cover as lower elevation sections of the BJCMNP which have suffered significant degradation are now excluded. Despite the considerable reduction in size, many of the extraordinary values (species) are spatially restricted and well-covered in the nominated area. The IUCN Panel considered that whilst the integrity of upper elevation habitats and their species assemblages has been improved, the reduced size of the property and its restricted altitudinal ecological gradients impedes to some extent the ecological and biological processes.

The planning, regulation, land use and management of the lower elevation buffer zone are considered critical to ensure the intactness of systems within the vulnerable upper elevations of the nominated property. The history of land use disturbance was noted in the 2011 IUCN evaluation which stated "Deforestation and forest degradation are well-documented both longstanding and acute threats. The issues overlap with agricultural encroachment and invasive alien

species but also hunting and uncontrolled collection of forest products.” Small scale shifting cultivation and large scale cultivation of coffee and other crops are now problems of the buffer zone however the interface with the nominated area remains of concern. The State Party has advised that most of the threats noted above are occurring within the community buffer zone which is a further zone outside of the World Heritage buffer zone. Various programmes and initiatives are underway to combat threats in this zone. Nonetheless the future of the montane forests is closely linked to the management of the lower elevations and edge effects increase the vulnerability to fire, invasive alien species, encroachment and other threats. IUCN notes that the revision of the property boundaries resolves most of the immediate integrity issues raised in 2011 although the reduced area compromises the natural function of ecological gradients as the property is restricted to upper elevations (above 850 m asl).

IUCN considers that the boundaries of the nominated property meet the requirements of the Operational Guidelines in relation to the application of criterion (x), but do not fulfill requirements for criterion (ix).

4.3 Management

The Natural Resources Conservation Authority (NRCA) through the National Environment and Planning Agency (NEPA) delegates the management of the nominated property to a national NGO, the Jamaica Conservation and Development Trust (JCDT). Since the area is also a Forest Reserve, Jamaica's Forestry Department (FD) is involved through a co-management agreement with NRCA and JCDT signed in 2000 and the Jamaica National Heritage Trust (JNHT) has recently joined this agreement. Part of the governance and management is guided by 3 committees (advisory, co-management and Maroon).

The BJCMNP has a well-structured 5-year management plan covering the period from 2011 to 2016 building upon a continuous series of plans since 1993 when the national park was established. The management plan does not refer specifically to but includes the nominated area. In line with the mixed nomination approach the current management plan establishes the conservation of both cultural and natural heritage as the overarching goal and articulates a mission statement calling for a “balance between biodiversity conservation and socio-economic development”. The management plan stresses the challenges facing the property and its buffer zone, noting concerns including “insufficient environmental education” and acknowledges “insufficient enforcement”, “unclear boundaries”, “insufficient conservation on the ground”, “inadequate resources and management”, as well as “conflicting policies between government agencies and insufficient support of conservation initiatives”.

Staffing includes an Acting Park Manager (who simultaneously serves as Executive Director of JCDT), seven professional park rangers, and a number of “programme managers”. The park rangers are led by a Chief of Corps and implement a number of

management activities structured thematically as programmes (natural heritage conservation; cultural heritage preservation; education and public involvement; recreation and tourism; monitoring and evaluation; enforcement and compliance). IUCN considers that management capacity is limited and this raises concerns regarding the capacity to address issues within the property, and, more so, to address the demanding task of improving land and resource use in the buffer zone. The governmental core budget provided through NEPA constitutes an estimated 30% of the annual budget required for park operations. Additional sources are revenues from recreational areas (some 10%) and a similar amount from the Jamaica National Parks Trust Fund (JNPTF). In other words, roughly half of the budget is based on relatively secure sources, whereas the remainder has to be constantly raised by the managing JCDT. This is supported by supplementary advice from the State Party which reports that government sources account for about 40% of recurrent, operational expenditure and the remaining recurrent expenditure is sourced from the JNPTF, Forest Conservation Fund, fundraising by the JCDT and revenue from the National Park's Recreational Areas. A 3-year budget has also been prepared for improved financial resource allocation in support of the work of the JCDT in relation to the future management.

IUCN, whilst noting the concerns regarding the adequacy of staff and financial resources for the long-term conservation of the property, considers that the management of the nominated property meets the minimum requirements of the Operational Guidelines.

4.4 Community

As BJCM is proposed as a mixed site, the integration of cultural heritage is central to the nomination and indeed to the management approach for the property. The Maroon local communities share a strong and longstanding identity with the natural values of the site and appear to strongly support the World Heritage nomination. Relationships appear positive with the national park and the JCDT. These matters will also be considered by ICOMOS.

The nominated property barely includes any human inhabitants; however, the buffer zone and its periphery host a significant number of communities. JCDT has a full understanding of the need and credible willingness to work with the residents of the buffer zone but conservation interventions appear modest due to resource constraints. Whilst the NGO led management system provides a strong foundation for participative planning and management, community-based groups or local cooperatives in support of environmental management and sustainable agricultural practices are absent or appear to have a low degree of formal organization. The management and decision-making referring to the (uninhabited) nominated area does not recognizably involve local residents with the exception of the Maroon.

4.5 Threats

Many of the threats identified in 2011 now relate to areas within the buffer zone however, they still require active intervention. Whilst the threat of deforestation has not disappeared, it seems limited within the nominated area due to the combination of natural and formal protection, limited timber value and limited potential for agricultural use. There appears to be some small-scale agriculture extending into some of the nominated area.

There are some reports of illegal logging and illegal collection of orchids and possibly some other species but this is most likely restricted to more accessible areas. While no data was made available, there is no reason to assume that local residents in the buffer zone and surrounding villages do not use the natural resources of the national park for construction, charcoal, firewood, food and medicine. However, the number of people entering the interior of the rugged mountains is likely to be very small.

As is common in island settings, Invasive Alien Species (IAS) constitute a major threat. Introduced mammals include rats and mongoose. Mongoose were purposefully introduced in a failed biological control attempt to control rats. Feral pigs are described to be common and are highly valued by local hunters. White-tailed deer are said to have escaped an enclosure during a hurricane, but the State Party reports these are restricted to lowland areas. It is believed that high hunting pressure keeps populations in check. A large number of invasive plants, including several tree species are visible in most of the visited areas and at times densely cover substantial areas of the buffer zone. Examples include *Pittosporum undulatum*, a woody species of Australian origin, Bracken Fern and Wild Ginger. Introduced bamboo and grass species not only create the biodiversity impacts commonly associated with IAS but also help spread fires.

There is concern about climate change impacts and hurricanes are reported to have increased in frequency and intensity and could constitute a natural threat. Encouragingly, research conducted in the national park suggests a remarkable resilience of the native forests confirming the premise that maintaining forests is a good investment in resilience.

A limited number of domestic and foreign visitors selectively use the park. Most visitation is restricted to a well-managed recreation area (Hollywell) with a number of maintained trails open to the public. There is some threat of increased pressure to open new trails to currently inaccessible peaks and ridges.

The Management Plan mentions a potential risk of future mining supported to apparently ambiguous legislation and a suggestion that prospecting licenses may have been granted in what is today BJCMNP prior to protected area designation. Supplementary information received from the State Party provided clear assurances that strict controls exist related to prevention of mining, however, there remains a risk

that mining could still be permitted subject to national priorities and high level approvals. This is concerning given the clear position that has been taken by IUCN and the Committee on the essential incompatibility between mining and World Heritage; it is therefore essential that the State Party commitments to not permit mining in the property be noted by the Committee, and that legislative approaches be strengthened to permanently remove this threat.

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

5. ADDITIONAL COMMENTS

None.

6. APPLICATION OF CRITERIA

John and Blue Crow Mountains has been nominated under natural criteria (ix) and (x) as well as under cultural criteria which will be evaluated by ICOMOS.

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

The nominated property lies within a bio-geographical province (Greater Antillean) and terrestrial eco-region (Jamaican Moist Forests), as well as an Endemic Bird Area and Centre for Plant Diversity, which are not yet represented on the World Heritage List. The BJCM has also been identified as a gap in representation of World Heritage sites: it belongs to a Centre of Plant Diversity and an Udvardy biogeographic province not yet represented on the List and it overlaps with one of 78 most irreplaceable protected areas in the world.

The 2011 evaluation of the larger BJCMNP concluded that it was of “national and regional importance for the conservation of Jamaica's highly endemic flora and fauna, in particular as regards the island's terrestrial and freshwater ecosystems.” The evaluation found however, that “the ongoing deforestation and degradation, especially of the vulnerable and particularly valuable forests in the lower altitudes, represent significant long term impacts on integrity in relation to this criterion.” Compared to the 2011 nomination, the nominated area is now restricted to the high elevations of two mountain ranges as opposed to a much larger area belonging to three mountain ranges. The area nominated in 2011 spanned an altitudinal range from 150 to 2,256m asl whereas the current nomination is restricted to elevations above 850m asl and the BJCM focuses on just one part of a single protected area representing only 11.5% of the larger Blue and John Crow Mountain system. Despite the clear global significance of Jamaica's biodiversity, IUCN considers that the combination of the nominated property's restricted altitudinal ecological gradients with the fact that areas in the buffer zone are heavily altered, impedes its ability to meet criterion (ix) with respect to the demonstration of unhampered ecological and biological processes.

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

Criterion (x): Biodiversity and threatened species

The Blue and John Crow Mountains belongs to the Caribbean Islands biodiversity hotspot and is an important centre for plant endemism in the Caribbean displaying 50% endemism in the flowering plants at elevations above 900-1000 m asl with between 30-40% of these species found only within the property's boundaries. One of two Centres of Plant Diversity in Jamaica, the property includes a reported 1,357 species of flowering plant of which approximately 294 are Jamaican endemics and 87 of these species are found only within the property. 61 species of liverwort and moss occur in the property as well as 11 species of lichen, all of which are endemic. Genera which are well represented in the endemic flora of the property include *Pilea* (12 spp); *Lepanthes* (12 spp); *Psychotria* (12 spp) and *Eugenia* (11 spp).

The Blue and John Crow Mountains overlaps with one of the world's most irreplaceable protected areas, based on its importance for amphibian, bird and mammal species. The property hosts globally significant populations of bird species and represents a key part of the Jamaican Endemic Bird Area. It is important for a number of restricted-range species as well as a large number of migratory birds such as the Petchary (*Tyrannus domenciensis*) Bicknell's Thrush (*Catharus bicknellii*) and Swainson's Warbler (*Limnothlypis swainsonii*). The property contains two of Jamaica's five Alliance for Zero Extinction sites, hosting a significant number of globally endangered species, including the critically endangered plant species *Podocarpus urbanii*, *Eugenia kellyana* and *Psychotria danceri*. The property is also home to several endangered frog and bird species including the critically endangered Arntully Robber Frog, *Eleutherodactylus orcutti* and the Jamaican Peak Frog, *E. alticola*. Threatened bird species include Bicknell's Thrush *C. bicknellii*, the Jamaican Blackbird, *Nesopsar nigerrimus*, as well as the Yellow-billed Parrot, *Amazona collaria* and Black-billed Parrot, *Amazona agilis*. The only terrestrial non-flying mammal species found in the nominated property is the threatened rodent Hutia, *Geocapromys brownii* with a population restricted to John Crow Mountains.

IUCN concludes that the nominated property meets this criterion.

7. RECOMMENDATIONS

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

The World Heritage Committee,

1. Having examined Documents WHC-15/39.COM/8B and WHC-15/39.COM/INF.8B2;

2. Inscribes the **Blue and John Crow Mountains (Jamaica)** on the World Heritage List under natural criterion (x);

3. Adopts the following Statement of Outstanding Universal Value in relation to natural criteria, which would be subject to amendment and harmonization with ICOMOS recommendations if the nominated property was also inscribed under cultural criteria:

Brief synthesis

The Blue and John Crow Mountains property comprises 26,252 ha of tropical, montane rainforest within the larger Blue Mountain and John Crow Mountain ranges, located in the eastern part of Jamaica in the Caribbean. These two ranges cover approximately 20% of the island's total landmass and are recognised for their biodiversity significance within the Caribbean Region. The property spans elevations from 850m to 2,256m asl and is surrounded by a buffer zone of some 28,494 ha. The high elevation, rugged landscape and the north and south-facing slopes of the mountains of the property have resulted in a wide variety of habitat types with nine ecological communities within the upper montane forest of the Blue Mountains (over 1,000m) and John Crow Mountains (over 600m). These include a unique Mor Ridge Forest characterised by a deep layer of acidic humus with bromeliads and endangered tree species. Above 1,800m, the vegetation of the Blue Mountains is more stunted with some species restricted to these altitudes. Above 2,000m the forest is known as Elfin Forest due to the stunted and gnarled appearance of the trees which are heavily coated with epiphytes including hanging mosses, ferns and tiny orchids.

The Blue and John Crow Mountains lies within the Jamaican Moist Forests Global 200 priority ecoregion, and part of one of the 78 most irreplaceable protected areas for the conservation of the world's amphibian, bird and mammal species. Furthermore it coincides with a Centre of Plant Diversity; an Endemic Bird Area and contains two of Jamaica's five Alliance for Zero Extinction sites. There is an exceptionally high proportion of endemic plant and animal species found in the property, Jamaica having evolved separately from other landmasses. In addition, the property hosts a number of globally endangered species, including several frog and bird species.

Criteria

Criterion (x)

*The Blue and John Crow Mountains belongs to the Caribbean Islands biodiversity hotspot and is an important centre for plant endemism in the Caribbean displaying 50% endemism in the flowering plants at elevations above 900-1000 m asl with between 30-40% of these species found only within the property's boundaries. One of two Centres of Plant Diversity in Jamaica, the property includes a reported 1,357 species of flowering plant of which approximately 294 are Jamaican endemics and 87 of these species are found only within the property. 61 species of liverwort and moss occur in the property as well as 11 species of lichen, all of which are endemic. Genera which are well represented in the endemic flora of the property include *Pilea* (12 spp); *Lepanthes* (12 spp); *Psychotria* (12 spp) and *Eugenia* (11 spp).*

The Blue and John Crow Mountains overlaps with one of the world's most irreplaceable protected areas, based on its importance for amphibian, bird and mammal species. The property hosts globally significant populations of bird species and represents a key part of the Jamaican Endemic Bird Area. It is important for a number of restricted-range species as well as a large number of migratory birds such as the Petchary (*Tyrannus domenciensis*) Bicknell's Thrush (*Catharus bicknellii*) and Swainson's Warbler (*Limnotherapia swainsonii*). The property contains two of Jamaica's five Alliance for Zero Extinction sites, hosting a significant number of globally endangered species, including the critically endangered plant species *Podocarpus urbanii*, *Eugenia kellyana* and *Psychotria danceri*. The property is also home to several endangered frog and bird species including the critically endangered Arntully Robber Frog, *Eleutherodactylus orcutti* and the Jamaican Peak Frog, *E. alticola*. Threatened bird species include Bicknell's Thrush *C. bicknellii*, the Jamaican Blackbird, *Nesopsar nigerrimus*, as well as the Yellow-billed Parrot, *Amazona collaria* and Black-billed Parrot, *Amazona agilis*. The only terrestrial non-flying mammal species found in the nominated property is the threatened rodent *Hutia*, *Geocapromys brownii* with a population restricted to John Crow Mountains.

Integrity

The property protects the most intact forests within the upper elevations of the Blue and John Crow Mountains. The more disturbed lower elevation areas are contained within the surrounding buffer zone. The property is legally well protected as it falls within the boundaries of the larger Blue and John Crow Mountains National Park and is aligned with the park's Preservation Zone, providing the strictest levels of protection within the zoning system. The area is rugged, remote with limited access thereby providing additional security against some threats. The boundaries of the property are well designed to include the key attributes of its biodiversity values. Nevertheless there are a range of current and potential threats to the property, including from invasive alien species, encroachment, mining, fire and climate change. The majority of threats emanate from the interface between the higher elevation property and lowlands within the buffer zone.

Protection and Management requirements

The property enjoys good levels of legal protection as it lies within the Blue and John Crow Mountains National Park. As such it is protected by a suite of legislation including the Natural Resources (National Park) Act (1993) and its regulations; the Forestry Act (1996); the Natural Resources Conservation Authority Act (1991) and the Protected National Heritage under Jamaica National Heritage Trust Act (1985). The property is also covered by a well-structured 5 year management plan.

The Blue and John Crow Mountains is subject to a complex governance regime that ensures broader engagement but should strive for continually improved inter-organisational coordination and cooperation. The

management of the property recognises the complex interplay between its natural and cultural values and the Maroon local communities are positively engaged with the site and its management. Protection of the natural values of the property is also dependent to large extent on the sympathetic management of the lower elevation buffer zone which has been subject to a history of deforestation, agricultural land use and encroachment. Active and sustained management of the edge effects from surrounding lands will be critical to ensure issues such as buffer zone planning, development and land use do not impact on the property. It will be important to manage the potential impacts of invasive alien species, fire and encroachment from both small scale shifting agriculture and commercial coffee growing. Vigilance will be needed to ensure that mining exploration and/or operations are not permitted to overlap with the property, and legislation and policy should be tightened to protect the World Heritage site in perpetuity from mining, in line with the established position of the World Heritage Committee and leading industry bodies. Monitoring of climate change impact on the elevation sensitive ecology of the property will be important to ensure proactive planning and management of this threat.

Adequate and increased capacity of staff and funding necessary will be needed to manage the property in the face of the threats outlined above. Sustainable funding will be necessary in particular to strengthen management of the buffer zone and effectively address issues such as planning for sustainable development, support for livelihoods and enhanced community engagement.

4. Commends the efforts made by the State Party to reconfigure the nomination in response to the recommendations of the World Heritage Committee; to recognize the role of civil society and local communities in the management of the property and to address issues of protection and management of the property.

5. Notes with appreciation the assurances of the State Party that the property will be protected from mining, and requests the State Party, in line with the position of the World Heritage Committee on the incompatibility of mining with World Heritage site status, to strengthen legal protection of the property to ensure that no mining prospecting licenses and/or operations will be permitted within the nominated area, and that any mining activity in the buffer zone will be subject to rigorous Environmental Impact Assessment to ensure no adverse impacts on the Outstanding Universal Value of the property.

6. Takes note of the long history of the deforestation in the buffer zone of the property and requests the State Party to strengthen measures to combat the threat of small-scale and commercial agricultural encroachments impacting on the property by improving monitoring and public education, increasing technical capacity and engaging the support of relevant international institutions such as IUCN and FAO.

7. Encourages the State Party to allocate increased financial resources to ensure the effective long term management of the property, noting that current estimates suggest up to a doubling of the budget and resources for the protection of the property and buffer zone will be needed to ensure effective protection and management.

8. Further requests the State Party to submit to the World Heritage Centre, by **1 December 2017**, an updated report, including a 1-page executive summary, on the state of conservation of the property, including advice on actions to address fully the threats from mining and encroachment and updated data on the provision of adequate and sustainable financial resources to support the conservation of the property, for examination by the World Heritage Committee at its 42nd session in 2018.

Map 1: Nominated property location



Map 2: Nominated property and buffer zone

