IUCN Conservation Outlook Assessment 2014 **(archived)**
Finalised on 16 June 2014

Please note: this is an archived Conservation Outlook Assessment for Chitwan National Park. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

# Chitwan National Park

## SITE INFORMATION

Country:
Nepal
Inscribed in: 1984
Criteria:
(vii) (ix) (x)

Site description:
At the foot of the Himalayas, Chitwan is one of the few remaining undisturbed vestiges of the 'Terai' region, which formerly extended over the foothills of India and Nepal. It has a particularly rich flora and fauna. One of the last populations of single-horned Asiatic rhinoceros lives in the park, which is also one of the last refuges of the Bengal tiger. © UNESCO

# SUMMARY

## 2014 Conservation Outlook

**Significant concern**

The management at Chitwan National Park has been successful in ensuring effective conservation over the last few years; as shown in the rapid increase in tiger and rhino numbers. Nevertheless the site remains vulnerable to current threats such as pollution, invasive species and negative impacts of mass tourism, and to potential threats such as the impacts of climate change or earthquake or sudden and unexpected increases in poaching or the resurgence of political instability. As such Chitwan should remain on the radar of conservationists worldwide as an area of high concern – as well as an exemplar of effective management.

## Current state and trend of VALUES

**High Concern**
**Trend: Stable**

Terrestrial habitats in Chitwan support many endangered mammals which act as indicators of overall ecosystem health as well as species specific values.Overall numbers of rhino and tiger are rising as a result of effective management and protection regimes being in place suggesting that these WH values are being maintained.
Freshwater habitats in the park are less well studied; but evidence suggests that overall this ecosystem is under stress from pollution and impacts related to invasive species (for which at present no suitable management response has been found).
Thus despite the many excellent management actions undertaken by Chitwan National Park staff and partners the overall assessment of the status and trend of WH values remains of concern and management efforts and resources should remain at a high level of input to ensure the parks continued conservation success.

## Overall THREATS

**High Threat**

The site’s location in terms of potential threats (in particular in relation to flood risk exacerbated by climate change and earthquakes) and the rapid spread of invasive species means that despite the focus of management on minimising threats Chitwan remains a protected area under threat.

## Overall PROTECTION and MANAGEMENT

**Mostly Effective**

Chitwan faces many challenges from potential and pervasive threats, high demands from tourism and the constant threat from poachers. However since the ending of the Maoist insurgency in 2006 the site has seen an increasingly effective management and protection regime put in place which is in general effectively focused on the most important management issues. However, protection and management efforts appears to be focussed on mega fauna such as tiger and rhino, with less attention being paid to small mammals such as the otter, the fishing cat and others which are considered to be an indicator of the health of aquatic habitats.

# FULL ASSESSMENT

## Description of values

### Values

#### World Heritage values

- **Areas of exceptional natural beauty and aesthetic importance**
  **Criterion:(vii)**

  The spectacular landscape, covered with lush vegetation and the Himalayas as the backdrop makes the park an area of exceptional natural beauty. The forested hills and changing river landscapes serve to make Chitwan one of the most stunning and attractive parts of Nepal’s lowlands. Situated in a river valley basin and characterized by steep cliffs on the south-facing slopes and a mosaic of riverine forest and grasslands along the river banks of the natural landscape makes the property amongst the most visited tourist destination of its kind in the region. The property includes the Narayani (Gandaki) river, the third-largest river in Nepal which originates in the high Himalayas and drains into the Bay of Bengal providing dramatic river views and scenery as well as the river terraces composed of layers of boulders and gravels (SoOUV, 2013).

- **An outstanding example of biological evolution with a unique assemblage of native flora and fauna**
  **Criterion:(ix)**

  Constituting the largest and least disturbed example of sal forest and associated communities, Chitwan National Park is an outstanding example of biological evolution with a unique assemblage of native flora and fauna from the Siwalik and inner Terai ecosystems. The property includes the fragile Siwalik-hill ecosystem, covering some of the youngest examples of this as

well as alluvial flood plains, representing examples of ongoing geological processes. The property is the last major surviving example of the natural ecosystems of the Terai and has witnessed minimal human impacts from the traditional resource dependency of people, particularly the aboriginal Tharu community living in and around the park (SoOUV, 2013).

▶ **High species diversity, including endangered species**
**Criterion:(x)**

The combination of alluvial flood plains and riverine forest provides an excellent habitat for the Great One-horned Rhinoceros and the property is home for the second largest population of this species in the world. It is also prime habitat for the Bengal Tiger and supports a viable source population of this endangered species. Exceptionally high in species diversity, the park harbours 31% of mammals, 61% of birds, 34% of amphibians and reptiles, and 65% of fishes recorded in Nepal. Additionally, the park is famous for having one of the highest concentrations of birds in the world (over 350 species) and is recognized as one of the worlds' biodiversity hotspots as designated by Conservation International and falls amongst WWFs' 200 Global Eco-regions (SoOUV, 2013).

## Assessment information

### Threats

### Current Threats
**High Threat**

In general Chitwan National Park has put a high emphasis on the management of the many threats facing the protected area, which have proven successful. However the latest and rapidly increasing threat, related to the spread of invasive species is proving to be a hard threat to manage. Despite the manual removal of the species like Mikania micrantha, Lantana camara, Chromolaena odorata, and Eupatorium adenophorum and increasing scientific research on these species the PR assessment of 2011 notes that at present "there is no

effective solution for Mikania micrantha eradication”.

### ► Fishing / Harvesting Aquatic Resources

**High Threat**
**Inside site**

Localised and increasing fishing activity inside and outside the park, is having a significant impact (PR section 2, 2011). The Chitwan National Park provides fishing licenses to the traditional fishermen to support their livelihood. Besides these wetland dependent communities, others are also intensively fishing in the river on both banks resulting to scarcity of fish prey base, disturbances to the gharials and dolphins and their habitat loss. The fishermen use illegal large fishing net (gill net) which largely threatens the gharial population due to risk of being entrapped. In addition, small sized mesh nets are often used which removes both adult breeding stock and fingerlings from the populations reducing the possibilities of future breeding and recruitment from the areas (IUCN Consultation, 2014).

### ► Housing/ Urban Areas

**High Threat**
**Inside site**

Extensive (and increasing) housing development outside the park is having a significant impact on the site’s values (PR section 2, 2011)

### ► Commercial/ Industrial Areas

**Low Threat**
**Inside site**

Some localised development – although not increasing – is having a significant impact on the attributes (PR section 2, 2011)

### ► Tourism/ Recreation Areas

**High Threat**
**Inside site**

Localised and increasing development inside and outside the park, is having a significant impact on the attributes (PR section 2, 2011)

### ► Livestock Farming / Grazing

**Low Threat**
**Inside site**

There is some localised grazing inside the park, but the impact on values is minor, activities are managed and the threat is not increasing (PR section 2, 2011)

### ► Mining/ Quarrying

**Very High Threat**
**Inside site**

Quarrying outside the site is localised but increasing and impacts on the values are major despite management action (PR section 2, 2011)

### ► Roads/ Railroads

**High Threat**
**Inside site**

Impacts from existing roads are localised and not increasing in threat, but do have a significant impact on the site's values despite management actions (PR section 2, 2011). The UNDP Tiger-Rhino Conservation Project, for example, noted the lack of enforcement of the 40 mph speed limit along the Highway through the National Forest near the Park (Tiwari et al, 2007).
The proposed Hulaki road and railway through CNP pose a very high threat which can affect the ecological integrity of the park (SOC report 2014). This issue is discussed further below under "potential threats".

### ► Subsistence hunting

**Low Threat**
**Inside site**

Commercial and subsistence wild plant collection within the park is a threat, however it is restricted to a few locations, is not increasing, is managed and has low impacts on the site's values (PR section 2, 2011)

### ► Other Biological Resource Use

**High Threat**

A strict protection regime is resulting in increasing numbers of endangered species (see below) however poaching remains a constant threat for protected areas such as Chitwan National Park which protect species with a high market value (IUCN/UNESCO, 2007).

### ► Tourism/ visitors/ recreation

**High Threat**
**Inside site**

Impact of tourism/ visitors outside the park although localised and managed is increasing and having a significant impact on the values (PR section 2, 2011). Chitwan National Park (CNP) is a major tourist attraction in Nepal (over 20% of the tourist visiting the country in 2006/07) so careful management of impacts is vital (IUCN/UNESCO, 2007).

### ► Dams/ Water Management or Use

**High Threat**
**Inside site**

The Gandak barrage in Narayani at Bhainsalotan has disrupted the migration and movements of aquatic animals such as dolphin, crocodile and fishes. The dam seriously threatens the survival of dolphins in CNP. DNPWC/MFSC is coordinating with the Indian counterparts to minimize the obstacles created by the barrage (IUCN/UNESCO, 2007).
Water management is a potential threat outside the park (PR section 2, 2011)

### ► Invasive Non-Native/ Alien Species

**Very High Threat**

Invasive species (including freshwater species) are an increasing problem in the whole area (i.e. inside and outside of the park). They have a significant impact on attributes and management capacity to deal with this threat is low (PR section 2, 2011). The main problem is an invasive creeper, Mikania micrantha, which thrives in moist areas and riversides and can smother and kill native flora such as grasses and sapling trees, several of which are important fodder plants. To date eradication measures have proved unsuccessful and the plant is spreading stimulated by the movement of people and animals within the park. Impacts on wetlands include some

reduction in bird species (including the vulnerable swamp francolin (Francolinus gularis) and the plant is impacting mammals in terms of reducing food and cover for hunting (BBC, 2010 and Pokharel, 2012). Other species invasive species include Lantana camara, Chromolaena odorata and Eupatorium adenophorum.
A recent survey found Mikania across 44% of habitats sampled and almost 15% of these have a high infestation (> 50% coverage). Highest densities were recorded from riverine forest, tall grass and wetland habitats. Local community dependence on natural resources in the core area of the Park is high. The range and volume of resources (e.g. fodder) collected and the distances travelled all pose a high risk of the spread of Mikania (Murphy et al, 2013).

### ► Water Pollution

**High Threat**
**Inside site**

Extensive (and increasing) ground water pollution outside the park, is having a significant impact; surface water pollution is a more localised problem but is also increasing and management capacity to deal with this threats is very limited (PR section 2, 2011).
In total, there are 9 major mills and distilleries, (Bhrikuti Paper & Pulp Mill, San Miguel Beer etc) discharging effluent into the Narayani river (PR summary, 2003). Water pollution is cited as a cause of Gharial population decline (see discussion below). Increasing industrialization is leading to increase in pollution loads from factories. Discharges from the Gorkha Brewery and Bhrikuti Paper and Pulp factory and Pharmaceutical and Gill Mary are the major sources of pollution in Narayani River (Rajbhandari and Acharya, 2013).

### ► Erosion and Siltation/ Deposition

**Very Low Threat**
**Inside site**

Although frequent, landslides are very localised and there is some management capacity to deal with impacts (PR section 2, 2011)

### ► Erosion and Siltation/ Deposition

**High Threat**

**Inside site**

Erosion and siltation impacts (e.g. eutrophication) are extensive, on-going and increasing and have a significant impact on the site's values. There is low management capacity to deal with impacts (PR section 2, 2011).

### ► Storms/Flooding

**High Threat**
**Inside site**

The Chitwan area is one of the most flood prone districts in Nepal. In 1993, for example, devastating floods affected many thousands of people in the Terai landscape, damaged the tourism infrastructure of Sauraha, a gateway into the park, and killed some endangered species of animals and destroyed their habitats (Nyaupane and Chhetr, 2009 and Government of Nepal, 2011). In 2010 floods inundated hundreds of houses of Mandi area in western Chitwan district. Although flooding impacts are localised they are increasing. Floods have a significant impact on the attributes of the property and there is low management capacity to deal with impacts (PR section 2, 2011). The long embankments of the Rapti and Narayani Rivers have adverse impact on natural functioning of the ecosystem (IUCN Consultation, 2014). A community based early warning system for floods and other natural disasters has however been implemented by Practical Action (Government of Nepal, 2011).

### ► Identity/ Social Cohesion/ Changes in local population and community

**High Threat**
**Inside site**

Social change impacts are naturally localised but seen as having an increasing and significant impact (the desire of buffer zone communities to be on the national electricity grid outlined below is an example of changing desires and attitudes) (PR section 2, 2011). The traditions, cultures and production systems of some indigenous and ethnic groups are rapidly changing due to the influx of foreign tourists and resettlement of some villages from their original place to elsewhere. The management has already established 'Tharu Cultural Museum' at Sauraha and provided training on cultural practices and traditional healing systems (IUCN/UNESCO, 2007)
A study to investigate the influence of changing social contexts on families in

the whole Chitwan Valley (the Chitwan Valley Family Study) notes that: In the late 1970s, the valley was linked to two major highways of national importance which facilitated a rapid proliferation of government services, businesses, markets, and diversified employment opportunities. For most of the older individuals, the rapid and vast social and economic changes have occurred within their own lifetime (Pradhan, 2011).

### ► Solid Waste

**Low Threat**
**Inside site**

Solid waste is a localised but increasing threat outside the park, it is having a significant impact on the values but there is little management capacity to deal with the issue (PR section 2, 2011).

## Potential Threats

**Very High Threat**

Climate change (in particular in relation to flood risk) and earthquakes are a constant threat to Chitwan. Although hard to assess it should also be noted that political instability in the past has had severe impacts on conservation efforts throughout Nepal (between 2000/01 to 2006/07 113 greater one-horned rhinoceros were killed by poachers in Chitwan when military protection for the park was withdrawn (IUCN/UNESCO, 2007). The proposed construction of the East-West Electric Railway and the Tarai Hulaki Highway, both of which would cross the property, would fragment important wildlife habitat, including for rhino, tiger, elephant and gaur. Both the road and the railroad are therefore considered to be very high threats.

### ► Temperature changes

**Data Deficient**
**Inside site**

Observed changes in climate / climate-related impacts include: increasing number of flood days in some rivers as well as trends towards a reduction in dependable flows in the dry season. Projections also suggest an increase in the intensities of monsoons (Nyaupane and Chhetr, 2009).

### ► Roads/ Railroads

**Very High Threat**
**Inside site**

There are plans for the construction of the East-West Electric Railway and the Tarai Hulaki Highway, both of which would cross the property. Alternative alignments that avoid the property appear not to have been considered (SOC report, 2014). The State Party acknowledges that the proposed road and railroad would fragment important wildlife habitat, including for rhino, tiger, elephant and gaur (State Party Report, 2014).

### ► Crops

**Low Threat**
**Outside site**

Agricultural production is a potential threat outside of the park (PR section 2, 2011)

### ► Fire/ Fire Suppression

**High Threat**
**Outside site**

Fire was considered a potential threat inside the park (PR section 2, 2011). However the role of fire was noted by Murphy et al (2013) as a contributory factor in the spread of the invasive species Mikania with the authors suggesting actions to control burning, reduce spread and raise awareness about best practice for local resource management by local communities.

### ► Utility / Service Lines

**Low Threat**
**Inside site**

There has been considerable concern over long term plans to connect the village of Madi (which is in the buffer zone of the park between the park boundaries and the Indian border) to the electricity grid through the laying of cables through the park. Last information on record (April 2013) notes that work has not begun (and incidentally notes the opportunity missed in this initiative to expand and explore more sustainable options already in place in the communities) (The Himalayan, 2013).

It should be noted that the proposal to substitute the original overhead transmission line proposed in 2001 for an underground line along the existing Hulaki road and the fireline of the park is in keeping with the recommendations of IUCN's 2002 monitoring mission. However IUCN noted in 2010 that "... the underground line traverses the core area of the property for 7.5km and that a number of issues remain of concern; i) potential poaching of endangered species and pollution due to temporary worker camps; ii) potential spread of invasive species, in particular Mikania micrantha which IUCN understands currently covers roughly 20% of the property, including 50% of rhino habitat; and iii) temporary disturbance to wildlife.". Despite this, and some concerns re the EIA, IUCN concludes "... IUCN considers that the Jagatpur-Madi sub-transmission appears to have addressed the main concerns raised regarding impacts on the property's values and integrity. If the project proceeds, then the mitigation measures proposed in the EIA, as well as IUCN's additional recommendations […], must be effectively implemented and monitored in order for the project to be acceptable" (IUCN, 2010)

### ► Earthquakes/ Tsunamis

**Data Deficient**
**Inside site**

The entire Himalayan belt is seismically active and earthquakes are a common threat in Nepal (see for example: http://www.earthquake-nepal.com/) (PR section 2, 2011)

## Protection and management

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## Assessing Protection and Management

### ► Relationships with local people

**Mostly Effective**

Several indicators drawn from responses to the periodic report of 2011 indicate the effectiveness of relations with local people.

(PR section 2, 2011)

The issue of equitable benefits sharing however tends to elicit varying opinions. For example one research survey notes: “Questionnaire interview data indicate the livelihoods of buffer zone residents remain strained by conservation activities. While benefits under incentive-based programmes are recognized by the residents, villages distant from the main tourist entry points to the park, where costs associated with conservation are highest, recognize few benefits. An individual's level of participation in tourism also affects the benefits received, with those directly employed in tourism receiving the most benefit. Despite the discrepancy in benefit distribution between villages and between levels of involvement in tourism, CNP is making progress in distributing benefits beyond villages where tourism is concentrated.” (Spiteri and Nepal, 2008).
Several projects in and around the park have worked on developing the links between communities, development and conservation. For example, the UNDP Tiger-Rhino Conservation Project, was deemed successful in terms of conservation (regeneration of the Barandabhar Forest ecological corridor, based on survey results, and resulting increases of species diversity/ breeding populations of endangered species) and livelihoods (improved livelihoods among at least 51% of the 3,500 households targeted for the introduction of a wide range of income-generating activities). Although the project evaluation notes that improvements in livelihoods have not been quantified and compared with the available baseline socio-economic data (Tiwari et al., 2007); which highlights the need for better monitoring and research on socio-economic data to help accurately assess the links between the Park and local communities.

### ► Legal framework and enforcement

**Highly Effective**

The legal framework for the maintenance of the Outstanding Universal Value provides an adequate or better basis for effective management and protection. The impacts of World Heritage status of the property in relation to the legal/policy framework by which the property is managed is very positive (PR section 2, 2011)

### ► Integration into regional and national planning systems

**Mostly Effective**

There is coordination between the range of administrative bodies / levels involved in the management of the property is sufficient but it could be improved (PR, 2011)

### ► Management system

**Mostly Effective**

The primary management document is the Management Plan for Chitwan National Park and its Bufferzone (2011-2016).
The management plan is adequate to maintain the property's Outstanding Universal Value. An annual work/action plan exists and many activities are being implemented (PR section 2, 2011)

### ► Management effectiveness

**Mostly Effective**

Several ME assessments have been made: EoH (2003 and 2007), PR report (2007 and 2011) and CNP is the first Protected Area in the tiger range countries to be approved under a new scheme from WWF – Conservation Assured | Tiger Standards in 2014. Management is considered to be mostly effective, however, protection and management efforts appears to be focussed on mega fauna such as tiger and rhino, with less attention being paid to small mammals such as the otter, the fishing cat and others which are considered to be an indicator of the health of aquatic habitats (IUCN Consultation, 2014).

### ► Implementation of Committee decisions and recommendations

**Highly Effective**

No recent Committee recommendations to implement; however past decisions have all been effectively resolved.

### ► Boundaries

**Highly Effective**

The boundaries of the World Heritage property are adequate to maintain the property's Outstanding Universal Value. (PR section 2, 2011).
Boundary protection is maintained with the aid of the government's

deployment of two protection units a Battalion and a Company having 1000 army personnel in Chitwan (PR section 2, 2011). The effectiveness of this strategy can be seen in the increasing populations of threatened species such as the tiger and rhino reported below.

### ► Sustainable finance

**Mostly Effective**

The available budget is acceptable but could be further improved to fully meet the management needs. The park is reliant on government funds (90% - average per cent of conservation budget over last 5 years) with the remaining small amount coming from NGOs (PR section 2, 2011).

### ► Staff training and development

**Some Concern**

The ranking of training opportunities for a range of disciplines in the PR shows that whilst training opportunities exist in the more ‘traditional’ protected area management activities (e.g. research and monitoring, education, conservation, administration and enforcement), less training is available for promotion, community outreach, visitor management and tourism and no opportunities exist for training in interpretation and risk preparedness (the latter being a particularly important point given the results of the threat assessment above) (PR section 2, 2011).

### ► Sustainable use

**Mostly Effective**

Harvesting of timber inside and outside of the park is assessed as sustainable (see question 3.5.10) (PR section 2, 2011). Other resource use such as fodder and medicinal plant use are all managed effectively by the PA.

### ► Education and interpretation programs

**Some Concern**

CNP received funding and developed an interpretation programme in the early 1990s. The 2011 PR notes that while there is fair availability of professionals for education interpretation availability is poor. There is a planned education and awareness programme but it only partly meets the

needs and could be improved.

### ▶ Tourism and interpretation

**Mostly Effective**

Visitor centre, site museum, information booths, information materials provide opportunities for interpretation; guided tours are as adequate whilst trails/routes and transportation facilities could be improved (PR section 2, 2011).

### ▶ Monitoring

**Some Concern**

There is considerable monitoring but it is not directed towards management needs and/or improving understanding of Outstanding Universal Value. Key indicators have been defined but monitoring the status of indicators could be improved (PR section 2, 2011).

### ▶ Research

**Mostly Effective**

Scientific studies related with Rhino, Tiger and Mikania micrantha are going on while more than 10 research projects relating to B.Sc, M.Sc and PhD studies from national and international level have been permitted yearly. Although there is considerable research it is not directed towards management needs and/or improving understanding of Outstanding Universal Value (PR section 2, 2011).

## Overall assessment of protection and management

**Mostly Effective**

Chitwan faces many challenges from potential and pervasive threats, high demands from tourism and the constant threat from poachers. However since the ending of the Maoist insurgency in 2006 the site has seen an increasingly effective management and protection regime put in place which is in general effectively focused on the most important management issues. However, protection and management efforts appears to be focussed on mega fauna such as tiger and rhino, with less attention being paid to small mammals such

as the otter, the fishing cat and others which are considered to be an indicator of the health of aquatic habitats.

▶ **Assessment of the effectiveness of protection and management in addressing threats outside the site**
**Data Deficient**

data deficient

▶ **Best practice examples**

Chitwan is well known as an exemplar of buffer zone management. The buffer zone communities are the principle stakeholders. CNP has institutionalized mechanisms in the buffer zone to minimize biotic pressures on the park and motivate communities in the participatory management forest resources to fulfil their needs of forest products. The long-term objective is to motivate local people and to win their support to involve them in nature and wildlife conservation. The local community receives up to 50% of the park's tourism generated revenue, alternative forest resources from BZ forest and employment opportunity from the site management and the site benefits from the community for resource management in the buffer zone(IUCN/UNESCO, 2007).

## State and trend of values

### Assessing the current state and trend of values

#### World Heritage values

▶ **Areas of exceptional natural beauty and aesthetic importance**
**Low Concern**
**Trend:Data Deficient**

The scenic values of the sites have so far been well preserved.

▶

### An outstanding example of biological evolution with a unique assemblage of native flora and fauna

**High Concern**
**Trend:Stable**

The main pressure on these values is the rapid expansion of the invasive species (Murphy et al, 2013) and the lack of success, to date, of eradication efforts.
Other changes in habitat include the ongoing increase of forest cover and subsequent reduction in the area of grassland, which may negatively affect mammal species (Bhattarai and Kindlmann, 2012). However it should be noted that the increase in forest cover is due to livestock grazing restrictions – thus removing an unnatural impact on the ecosystem (Gurung et al., 2009). Freshwater threats include pollution and dam impacts as well as the impacts of invasive species which are at particularly high densities in the riverine forest, tall grass and wetland habitats. Pollution is considered a cause of Gharial population decline and impacts on wetlands of invasive species include some reduction in bird species. Management of upper catchments particularly of Rapti River is urgently needed to maintain the health status of the wetlands of the CNP (IUCN/UNESCO, 2007).

### ► High species diversity, including endangered species

**Low Concern**
**Trend:Improving**

Key species management is being done based on national species action plans (Rhino, Tiger, Elephant). Tiger populations: Reports from the 2013 survey show an increase from 91 individuals in 2009 (Anon, 2013) to 120 (98-139) adult breeding tigers in Chitwan (NTNC, 2013). Prey density (animals/km2) was 73.63 (NTNC, 2013). The tiger however is endangered (IUCN Red Data List) across the species' (much reduced) range and thus needs to remain a species of concern and management focus. Greater one horned rhinoceros: Results from the 2011 three-week National Rhino Census reported the population of Rhino has increased by 95 from 2008; with a total of 503 rhinos recorded in the park (WWF, 2011). The success in Rhino conservation is due to increasing overall strict protection. The greater one-horned rhino is vulnerable (IUCN Red List) and thus needs to remain a species of concern and management focus. Gharial: Despite conservation programmes (India 1975, Nepal 1978) Gharial have declined over their entire

distribution range and are assessed as Critically Endangered by IUCN. The Gharial Breeding Centre in Chitwan is successfully breeding Gharials for release and regular re-introduction of young Gharials has been taking place since 1981 – however populations in the park remain low. A survey in 2003/2004 found population size estimates fluctuate between 34 (2003) and 38 (2004) (Ballouard et al., 2010). Only six nests were counted in the Park in 2006 (16 nests were recorded there in 1977) although several hundred Gharials had been released (Stevenson and Whitaker, 2010). A study carried out in Narayani River of Chitwan National Park from 2012 to 2013 recorded 38 Gharials including 3 hatchlings, 8 juveniles, 12 sub-adults and 15 adults. Only one breeding male was observed reflecting the critical condition for the breeding population (Rajbhandari and Acharya, 2013). The reintroduction programme, although of limited success, has no doubt helped to maintain the Gharial population.
It has been suggested that a large dam in Tribeni which is being built between Nepal and India, may be forcing aquatic species, including gharial to move downstream into India when the discharge of water is high during the monsoon season. Once on the Indian side, it's impossible for them to return to their original habitat, decreasing the Nepalese population (IUCN Consultation, 2014)

## Summary of the Values

### ► Assessment of the current state and trend of World Heritage values

**High Concern**

**Trend: Stable**

Terrestrial habitats in Chitwan support many endangered mammals which act as indicators of overall ecosystem health as well as species specific values.Overall numbers of rhino and tiger are rising as a result of effective management and protection regimes being in place suggesting that these WH values are being maintained.
Freshwater habitats in the park are less well studied; but evidence suggests that overall this ecosystem is under stress from pollution and impacts related to invasive species (for which at present no suitable management response has been found).
Thus despite the many excellent management actions undertaken by

Chitwan National Park staff and partners the overall assessment of the status and trend of WH values remains of concern and management efforts and resources should remain at a high level of input to ensure the parks continued conservation success.

## Additional information

### Key conservation issues

▶ **Invasive species**
**Local**

In particular the spread (and so far lack of success regarding control measures) of Mikania micrantha is a critical issue facing the park

▶ **Management and protection**
**Local**

The continued high standards of management and protection in particular re tiger and rhino’s should continue to be supported; and new effective protection initiatives embraced

▶ **Monitoring**
**Local**

A monitoring plan should be developed which involves a wide range of stakeholders and is effectively linked to research initiatives

▶ **Tourism**
**National**

Managing tourism impacts and increasing interpretation to ensure tourists understand, support and act accordingly in relation to their impacts on the park and it management

▶ **Development**
**National**

Several development issues (e.g. the Kasara Bridge, the Rapti River irrigation project and transmission lines) have raised concerns with the WH Committee over the last few years. These have been resolved through further developments of EIAs, WH Committee decisions etc. However there is clearly a need to remain vigilant of any new/potential development and ideally national development plans should be aware of and respect the conservation priorities of Chitwan and the surrounding areas

▶ **Gharial conservation**

**Global**

Gharial conservation remains a major management challenge and more research and best practice needs to be developed to ensure reintroduction programmes are effective

▶ **Pollution**

**National**

Local industries responsible for pollution (both manufacturing and tourism industries) should be encouraged to minimise pollution

## Benefits

### Understanding Benefits

▶ **History and tradition**

The sites with cultural, religious and archaeological importance includes: Triveni Ghat, Valmiki Ashram, Gajra Gajaha, Brahma Chauri and Laxmi Narayan Temple in Triveni; Panch Pandav, Shivalinga, Parsuram Kunda and Godak Nath Temple in Bankatta, Madi; and Someshvar Kalika monument in Madi (IUCN/UNESCO, 2007)

▶ **Collection of medicinal resources for local use**

Medicinal plants collection by the indigenous community is permitted (IUCN/UNESCO, 2007)

▶ **Fishing areas and conservation of fish stocks**

Traditional fishing to maintain the livelihood of the indigenous Bote people is permitted inside CNP (IUCN/UNESCO, 2007)

▶ **Sustainable extraction of materials (e.g. coral, shells, resin, rubber, grass, rattan, etc)**

Collection of thatch grass in the park by villagers is well controlled within CNP (IUCN/UNESCO, 2007)

▶ **Outdoor recreation and tourism**

CNP contributes nearly 60% of the tourism revenue of the protected areas (IUCN/UNESCO, 2007)

▶ **Importance for research**

Ease of accessibility means CNP is one of the most important places to study various natural phenomena, ecology and behaviour of wildlife and socio-economy of the people in Nepal. The scientific information generated from the park research has high value (IUCN/UNESCO, 2007)

### Summary of benefits

The fact that the Government of Nepal recognizes the role of people in biodiversity conservation including PA management, means that community engagement and agreements on legal resource use within CNP are well established and the range of benefits from the park are extensive.

## Projects

### Compilation of active conservation projects

| № | Organization/ individuals | Project duration | Brief description of Active Projects |
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| 1 | NTNC | The NTNC Biodiversity Conservation Centre in Chitwan has run many conservation projects in the park, one of the most recent reported above was a partner in the tiger census (NTNC, 2013) |
| 2 | WWF | WWF (international and primarily WWF Nepal) has been working with Chitwan for 20 years main project focus areas including. Community development and conservation projects in the Chitwan buffer zone. Rhino monitoring Terai Arc Landscape (TAL) program is being jointly implemented by DNPWC, the Department of Forests and WWF |
| 3 | USAID | “Nepal Tiger Genome Project” is using innovative genetic technology to build a comprehensive national DNA database of the endangered Bengal tigers living in Nepal’s Terai Arc Landscape |
| 4 | The Rufford Foundation | Several projects – which are reported in this assessment (see reference list) |
| 5 | Global Tiger Initiative (GTI) partners | Training courses for wildlife conservation professionals to introduce SMART patrolling practices and technology |
| 6 | Outreach International | Training elephants to work in the park |
| 7 | Cleveland Metroparks Zoo/Cleveland Zoological Society Asia Seed Grants Program | Community-based gharial conservation initiative in the Narayani River of Chitwan National Park |

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