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# Ardeotis nigriceps, Great Indian Bustard

Assessment by: BirdLife International



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### Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Aves	Otidiformes	Otididae

Taxon Name: Ardeotis nigriceps (Vigors, 1831)

### Common Name(s):

- English: Great Indian Bustard, Indian Bustard
- Spanish: Avutarda India, Avutarda Índica

#### Taxonomic Source(s):

Jones, A. E. 1916. *Gyps tenuirostris* (Hodgson), the Himalayan Longbilled Vulture, breeding near Ambala, Punjab. *Journal of the Bombay Natural History Society* 24: 358.

#### **Identification Information:**

92-122 cm. Unmistakable, large, brown-and-white bustard with black crown and wing markings. Males have whitish neck and underparts with narrow black breast-band. Females are smaller, with greyer neck and typically no or incomplete breast-band. **Voice** Booming moans during display and barking or bellowing sounds when alarmed.

### **Assessment Information**

Red List Category & Criteria:	Critically Endangered A2a+4acd; C1 ver 3.1
Year Published:	2018
Date Assessed:	August 17, 2018

#### Justification:

This species is listed as Critically Endangered because it has an extremely small population that has undergone an extremely rapid decline owing to a multitude of threats including habitat loss and degradation, hunting and direct disturbance. It now requires an urgent acceleration in targeted conservation actions in order to prevent it from becoming functionally extinct within a few decades.

#### **Previously Published Red List Assessments**

2017 – Critically Endangered (CR) http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T22691932A118025435.en

2017 – Critically Endangered (CR) http://dx.doi.org/10.2305/IUCN.UK.2017-1.RLTS.T22691932A112106923.en

2016 – Critically Endangered (CR) http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T22691932A93329902.en

2015 – Critically Endangered (CR) http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T22691932A78971511.en

2013 – Critically Endangered (CR)

http://dx.doi.org/10.2305/IUCN.UK.2013-2.RLTS.T22691932A48135304.en 2012 – Critically Endangered (CR) 2011 – Critically Endangered (CR) 2008 – Endangered (EN) 2004 – Endangered (EN) 2000 – Endangered (EN) 1996 – Endangered (EN) 1994 – Endangered (EN) 1988 – Threatened (T)

### **Geographic Range**

### **Range Description:**

The species occurs in the Indian Subcontinent, with former strongholds in the Thar desert in the northwest and the Deccan tableland of the Peninsula (BirdLife International 2001). It has been extirpated from 90% of its former range and is now principally confined to Rajasthan. In 2014 a survey of the Thar Desert, Rajasthan, estimated the species was present at a density of  $0.61 \pm 0.36$  individuals/100 km<sup>2</sup>, yielding abundance estimates of  $103 \pm 62$  in the sampled area ( $16.9 \text{ km}^2$ ) and  $155 \pm 94$  individuals in the Thar landscape ( $25,488 \text{ km}^2$ ). During the survey, 38 individuals were detected (Dutta *et al.* 2014), and surveys in 2015 found 40 individuals (G. Bhardwaj *in litt.* 2016). Smaller populations (likely to be considerably fewer than 15-20 birds [P. Patil *in litt.* 2016]) are present in Gujarat, Maharashtra, Andhra Pradesh and Karnataka, with birds now absent from Madhya Pradesh (Anon. 2015), **India**. It is also reported to breed in **Pakistan**, however, information on breeding activity has not been published (P. Patil *in litt.* 2015).

Recent declines have been noted in several areas, including Maharashtra (Kasambe et al. 2006, P. Patil in litt. 2011, Anon. 2015), Kachchh (Dutta in litt. 2012) and Rajasthan (P. Patil in litt. 2015). In Maharashtra, the latest population estimates suggest a population as low as 10 individuals (P. Patil in litt. 2016, G. Bhardwaj in litt. 2016), and numbers have been falling in the Bustard Sanctuary since at least the late 1980s, with the 2010 census recording only nine individuals and only three individuals (one male and two females) recorded in 2014 (P. Patil in litt. 2014), while breeding has not been recorded there since 2007 at least (P. Patil in litt. 2011). A recent survey in Nashik, Maharashtra failed to find the species (P. Patil in litt. 2014), whilst a survey in the Vidarbha region of Maharashtra provided an estimate of six or seven birds between April 2012 and May 2013 (Anon. 2014b). Populations in Karnataka, Maharashtra and Andhra Pradesh are considered at risk of local extinction (Anon. 2015). In Kachchh the latest population estimate is fewer than 20 birds at densities of 0.05 per km<sup>2</sup> in c. 400 km<sup>2</sup> of suitable habitat (Dutta in litt. 2012). The species is likely to be close to disappearing from Karnataka (Kumara and Mohan Raj 2007, S. Kottur in litt.), and it is thought to have completely disappeared from the states of Haryana, Punjab, Orissa, Uttar Pradesh, Tamil Nadu and Madhya Pradesh (Anon. 2015), India, but some apparently survive in Pakistan, with reports from several localities (Khan et al. 2008, Dutta et al. 2010, Anon. 2013c, B. Lechleiter in litt. 2011). Indian states in order of importance for the species are as follows: Rajasthan, Gujarat, Maharashtra, Karnataka and Andhra Pradesh (Anon. 2015). Sites in order of priority for the species are: Desert National Park Sanctuary (Rajasthan), Naliya (Gujarat), Warora (Maharashtra) and Bellary (Karnataka) (Anon. 2015).

Its total population has declined from an estimated 1,260 individuals in 1969 to c. 300 individuals in 2008 (Dutta *et al.* 2010), equivalent to a reduction of c. 82% over 47 years (three generations), assuming an exponential trend. The results of a recent genetic study, in which the effective population size was estimated from the diversity of mitochondrial DNA, provide support for an estimate of fewer than 1,000 birds, and likely about 500 during the period 2006-2010, when samples were collected (Ishtiaq *et al.* 2011). This study found very low genetic diversity for such a widespread species, probably owing to a bottleneck event caused by its widespread extermination possibly even before the mid 19th century (Ishtiaq *et al.* 2011). Population viability analysis predicts a high probability of local extinction within 50 years for populations numbering fewer than 30 individuals, with the more secure population of over 100 individuals showing sensitivity to the loss of one additional adult each year to human causes, indicating that present levels of off-take are unsustainable (Dutta *et al.* 2010). Current levels of hunting may result in the extinction of even the largest western Indian population in the next 15-20 years (Dutta *et al.* 2010).

#### **Country Occurrence:**

Native: India; Pakistan

## **Distribution Map**

Ardeotis nigriceps



#### Range

Extant (resident) Possibly Extinct

#### Compiled by:

BirdLife International and Handbook of the Birds of the World (2017)





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### Population

The species's total population was estimated at c. 300 individuals in 2008, indicating that there are probably fewer than 250 mature individuals remaining, hence the population is placed in the band 50-249 mature individuals.

### **Trend Justification**

Population estimates of c.1,260 individuals in 1969 (Dharmakumarsinhji 1971 in Dutta *et al.* 2010) and c.300 individuals in 2008 (Dutta *et al.* 2010) suggest that the species has undergone a decline equivalent to c. 82% over 47 years (estimate of three generations), assuming an exponential trend. The results of population viability analysis (Dutta *et al.* 2010) lend some support to a predicted decline of over 50% during the next 47 years if no additional conservation actions are taken.

Current Population Trend: Decreasing

### Habitat and Ecology (see Appendix for additional information)

This species inhabits arid and semi-arid grasslands with scattered short scrub, bushes and low intensity cultivation in flat or gently undulating terrain. Birds congregate in traditional less disturbed grassland patches to breed during mid-summer and monsoon. It nests in open ground, laying only one clutch (consisting of one and very rarely two eggs) per year. Outside of breeding season, it probably makes local and possibly long distance nomadic movements (largely unknown) in response to various factors, using areas rich in food resources and surrounded by natural grass-scrub habitat (including agricultural fields [G. Bhardwaj *in litt.* 2016]) for easy navigation. It requires different microhabitat envelopes for different activities, such as grasslands with relatively tall (vegetation 25-100cm) and dense cover, high insect resources and less grazing for nesting; short sparse vegetation (<25 cm vegetation) on slightly elevated ground for display; sparse vegetation (<25 cm vegetation) with minimal scrub for roosting; and moderate (25-50 cm) vegetation or medium sized trees for shade or roosting (Rahmani 1989, Dutta *in litt.* 2012, G. Bhardwaj *in litt.* 2016).

Systems: Terrestrial

### **Threats** (see Appendix for additional information)

Historically, widespread hunting for sport and food precipitated its decline, accelerated by vehicular access to remote areas. High intensity poaching still continues in Pakistan (which is probably shared with western Rajasthan and Kachchh populations), where 49 birds were hunted out of 63 that were sighted over a period of four years (Khan *et al.* 2008). Some poaching continues in India as well (Sridhar 2005, Dutta *et al.* 2010, P. Patil *in litt.* 2011, Anon. 2013a, Anon. 2015), including one documented case where mine-workers that lost their livelihoods when mines near Gwalior were closed for the creation of the Ghatigaon Bustard Sanctuary hunted bustards to undermine the criteria on which the area was first designated as a sanctuary (Sridhar 2005). Additionally, in 2012, a bird was poached inside the protected area in Jaisalmer, Rajasthan (P. Patil *in litt.* 2012, G. Bhardwaj *in litt.* 2016). Hunting was also prevalent in Maharashtra in the past (Anon. 2015). Egg-collecting was rampant in many states during the early 19th century, and prevails very sporadically in Karnataka and Andhra Pradesh (P. Patil *in litt.* 2011).

However, the current threats are mostly from habitat loss and degradation, caused by; 1) widespread agricultural expansion and mechanization of farming; 2) infrastructural development such as irrigation

(including a canal at Nannaj GIB Sanctuary [P. Patil *in litt.* 2016]), roads, electricity pylons, wind turbines and constructions; 3) mining and industrialization; 4) well intended but ill-informed habitat management (Singh *et al.* 2006); and 5) lack of community support (P. Patil *in litt.* 2011, 2013, 2015). With increased availability of water due to Government irrigation policies, agriculture has spread over vast arid–semiarid grasslands. For example, the Indira Gandhi Nahar Project has caused drastic hydraulic changes and massive agricultural conversion in and around the Desert National Park Sanctuary. Moreover, irrigation facilities and changing lifestyles have led to a shift in the crop pattern from bustard–friendly traditional monsoonal crops (sorghum, millet, etc.) to cash crops (sugarcane, grapes, cotton, horticulture, etc.), which are not suitable for the species. Due to ill-defined land distribution policies and the ambiguity arising from segregated ownership between private, community and government bodies, encroachment is a major problem in many bustard areas, especially in and around bustard sanctuaries of Maharashtra, Kachchh and Rajasthan.

Activities such as mining, stone quarrying, growth of industries, heavy pesticide use, grassland conversion and power projects along with the expansion of roads, electricity pylons, wind turbines, solar energy projects and other infrastructures have increased the severity of habitat degradation and disturbance (Anon 2015). The population in Madhya Pradesh has been lost due to trespassing, encroachment, mining and quarrying activities (Anon. 2015). Two individuals in Maharashtra (P. Patil in litt 2011) and one individual in Kachchh were reportedly killed by collisions with power-lines (Gadhavi 2014). Traditionally, grasslands and scrub have been considered as wasteland and the Forest Department policy, until recently, has been to convert them to forests with plantation of fuel/fodder shrub/tree species, even exotics like Prosopis juliflora, Acacia tortilis, Gliricidia and Eucalyptus spp., under social forestry and compensatory afforestation schemes (Forest (Conservation) Act 1988; Indian Forest Act 1927) resulting in further loss of habitat. Afforestation has been highlighted as a problem at five sites used by the species: Thar desert (Rajasthan), Naliya (Gujarat), Nannaj (Maharashtra), Ranibennur (Kamataka) and Rollapadu (Andhra Pradesh) (Anon. 2015, P. Patil in litt. 2016, G. Bhardwaj in litt. 2016). Overgrazing on unprotected lands has also led to degradation of some areas (Mathew 2007, Dutta et al. 2010, Anon. 2013c, P. Patil in litt. 2011), especially in the Thar desert (P. Patil in litt. 2016), and nest failure is commonly attributed to trampling by livestock (Anon. 2013c, Collar and Kirwan 2015). Hunting and egg collection remains a threat (Anon. 2014a). Free-ranging dogs pose a threat at all sites in India through disturbance of nesting adults and destruction of eggs (Anon. 2014c, 2015, P. Patil in litt. 2015), while free-ranging pigs may also pose a threat (P. Patil in litt. 2016). Nests may also be predated by House Crows (Corvus splendens) (Collar and Kirwan 2015, P. Patil in litt. 2016). Antagonism towards the species by local people is a major threat, and one reported to be increasing around Desert National Park Sanctuary due to political interests of local leaders (Anon. 2015).

### **Conservation Actions** (see Appendix for additional information)

### **Conservation Actions Underway**

CITES Appendix I. In India it is legally protected under Schedule 1 (Wildlife (Protection) Amendment Act 2002 [Ministry of Environment and Forests, Government of India 2003]) and there are severe penalties for killing an individual. It has been the focus of several publicity initiatives aimed at reducing hunting. Since 1981, extensive fieldwork has investigated its status, distribution and ecology, and a detailed conservation strategy has been published. Protected areas have been specifically established for the species (Sonkhaliya-Sorson, Lala-Naliya, Gaga-Bhatiya, Karera, Ghatigaon, Nannaj and Ranibennur), and populations occur in some others (Desert National Park Sanctuary and Rollapadu Wildlife Sanctuary). Desert National Park Sanctuary has now been proposed as a Biosphere Reserve by the Indian

government (P. Patil *in litt.* 2016). Despite some failures (local extinctions in Sorson, Karera, Ghatigaon, Gaga-Bhatiya and Ranibennur), there have been some successes, and one female was recently seen in Sonkhaliya Lesser Florican area (D. Nandan *per.* P. Patil *in litt.* 2016). Rehabilitation of grasslands has benefited the species in some areas (particularly Desert National Park Sanctuary [P. Patil *in litt.* 2016]). Grassland restoration through tree (*Gliricidia spp.*) removal has taken place at the GIB Sanctuary in Maharashtra (P. Patil *in litt.* 2016) and within six months Great Indian Bustards were seen in the area (P. Patil *in litt.* 2016). Tree removal is also planned for the Rollapadu Sanctuary (Anon. 2015). A programme of management to remove an invasive weed species, *Prosopis juliflora*, from grassland in Kachchh proved successful as within seven days, Great Indian Bustard was observed in the cleared area (Anon. 2014c).

The Indian government has provided financial support to conservation actions for this species in some regions (Anon. 2009), and in association with several NGOs and experts has developed guidelines for State Action Plan for Resident Bustards' recovery programme (Dutta et.al. 2013), as well as identifying key policies to protect grassland habitats (Anon. 2011a). 'Project Great Indian Bustard' has been launched in Rajasthan including constructing breeding enclosures for the species and developing infrastructure to reduce human pressure on habitats (Anon. 2013b). In Kachchh, a pilot programme has been established to neuter stray dogs around the core areas of the Bustard Sanctuary (Anon. 2014c). At the same time the dogs are vaccinated against rabies which will benefit the local community. Meetings and processions with local communities have been carried out in the past by the Bombay Natural History Society (Rahmani 2006) to generate support for birds among local people; and a procession was organised to establish a statue of Great Indian Bustard in a Hindu temple at Sankhala village in Rajasthan (P. Patil in litt. 2016). More recently (March 2011), the Great Indian Bustard Foundation group held a two-day meeting with communities within and around the Great Indian Bustard Sanctuary at Nannaj (Patil 2011). Nearly 600 villagers attended and discussions covered the problems of local people and threats to the species (Patil 2011). School awareness programmes and large-scale community awareness programmes are also underway (e.g. Rahmani 1998, Sanctuary Asia 2016). Publicity materials and media stories have been produced to raise awareness of the species in India (Anon. 2015), and engagement activities with shepherd communities have aided in species monitoring and raising awareness (P. Patil in litt. 2016).

In August 2013 a three-year BirdLife Preventing Extinctions Programme/RSPB funded project was initiated with Bombay Natural History Society (Anon. 2014a), and a further project supported by the Whitely Fund for Nature (WFN) has also begun (P. Patil *in litt.* 2016). A programme of research was set up to monitor the species and its grassland habitats (Anon. 2014a). In India, workshops on implementing conservation plans were held in four states with Great Indian Bustard populations, capacity-building workshops were also held for members of the local community, NGO and Government staff (Anon. 2015). A community awareness campaign was held in the Thar desert, Rajasthan between February and March 2014. Advocacy work under this project has helped to reduce community resentment against the species (including initiating a livestock health-check programme), and led to well-informed conservation planning, better coordination between different stakeholders, and mutual cooperation between different departments over conservation issues (Anon. 2014d, Anon. 2015). Community resentment may also be further reduced by making protected areas more targeted towards the habitats where the species occurs, as has been attempted in Maharashtra (Varghese *et al.* 2016). Emergency conservation has been prepared for Rollapadu Wildlife Sanctuary, Andhra Pradesh, and for Karera and Ghatigaon GIB Sanctuaries in Madhya Pradesh (Anon. 2014d). To clear confusions over land

records and ownership related issues inside Desert National Park a new scientific map is being prepared (P. Patil *in litt.* 2016). Rajasthan State Forest Department has initiated a process of transferring land inside Desert National Park Sanctuary from State Revenue Department to State Forest Department, and the Rajasthan State Forest Department has secured more breeding habitat for species by increasing the number and size of closures across important breeding patches (P. Patil *in litt.* 2016). Additionally, the Rajasthan State Forest Department has banned construction of any new wind turbine in prime bustard landscape (e.g. in region of Jasialmer [G. Bharwaj *in litt.* 2016]) without prior permission and clearance from the government, and predator-proof fences are being made to prevent the entry of free-ranging dogs, pigs, foxes, and monitor lizards into Great Indian Bustard breeding areas (G. Bharwaj *in litt.* 2016, P. Patil *in litt.* 2016). Planting of plant species other than local grasses has been discouraged in prime habitat by Rajasthan Forest Department and waterholes are being strictly maintained with a constant supply of water (P. Patil *in litt.* 2016). Camera traps have been installed at waterholes to monitor threats and species movement (P. Patil *in litt.* 2016). BNHS has initiated an advocacy with Indian Army in order to monitor and protect individuals inside army managed restricted areas (P. Patil *in litt.* 2016). A protected area for the species has been reportedly proposed by NGOs in Pakistan (P. Patil *in litt.* 2016).

The PEP and WFN projects have also supported local communties. The measures involved include developing the community network to monitor the species and its threats and supporting ecosystembased livelihood practices. For instance, the Rajasthan State Forest Department (in collaboration with BNHS) has initiated livelihood leverage for women near Desert National Park through the setting up of local craft businesses, and have involved local community Eco-Development Committees (EDC) into conservation actions benefiting people (Anon 2016). These programmes have also directly supported local livelihood through efforts such as the 'Local Community Nature Guide Program' at Desert National Park Sanctuary (Anon 2014d, Anon 2015, Anon 2016); and BNHS in collaboration with Wildlife Conservation Trust (WCT) and Rajasthan State Forest Department have organised field training on the prevention of wildlife crime with special reference to Great Indian Bustard for ground level staff of State Forest Department Staff in Jaisalmer (Anon 2016). More guards have also been recruited to help protect the Great Indian Bustard in Desert National Park Sanctuary, and the local youth have been engaged in monitoring and patrolling by the State Forest Department (Anon 2016). Additionally, a capacity building programme was organised on Indian Wildlife (Protection) Act for State Forest Department Officers in Jodhpur, Rajasthan.

Threats such as large powerlines and wind turbines have been mapped over prime habitat (P. Patil *in litt*. 2016), and considering the threat of disturbance from wildlife photographers during breeding season, photography of Great Indian Bustard has been banned in Gujarat and has been discouraged elsewhere in India (P. Patil *in litt*. 2016). The Government of India (Wildlife Institute of India) in collaboration with Rajasthan State Forest Department has also proposed an ex-situ conservation project in Rajasthan (P. Patil *in litt*. 2016).

#### **Conservation Actions Proposed**

A vast array of conservation actions have been proposed for this species, from a range of sources (P. Patil *in litt.* 2016). The Ministry of Environment and Forests, Government of India have set up a Task Force to guide field implementation of bustard conservation actions. The Government of India has published guidelines for the state action plan for resident bustards' recovery programme through meetings and workshops involving many parties (officials, experts, local people) (Dutta *et al.* 2013). Rajasthan State Government has set up a sub-committee on rationalisation of boundaries of Desert

National Park Sanctuary (Upadhyay *et al.* 2015) and put forward measures through 'Project Great Indian Bustard'; and IUCN Bustards Specialists Group along with Bombay Natural History Society and Rajasthan State Forest Department has published a 30 points action plan for saving Great Indian Bustard in Thar Desert, Rajasthan (Collar *et al.* 2015). Broadly speaking, the proposed conservation actions are:

1) To consolidate core breeding areas identified across the species's range by creating strict refuges during prime breeding months (March–September). This will require acquiring government lands that are not owned by Forest Departments; making all core areas inviolate by chain-link-fencing and patrolling guards; and removing nest predators therein. It has also been proposed that southernmost part of Desert National Park Sanctuary should be de-notified as it is highly degraded because of agriculture, pockets of grasslands should be developed by handing over revenue lands to Forest Department, privately owned areas and tourist zones such as Sam sand dunes could be excluded from protected area boundaries.

2) To formulate landscape conservation strategies in priority areas (informed by telemetry research). Evidence-based habitat management interventions should be planned and implemented (Dutta *et al.* 2012) including work to exclude any road construction activities and tall shrub/tree plantations as well as limiting grazing regimes. Infrastructure developments (roads, electricity network and wind turbines) known to have a negative effect on the species should be curtailed or minimised near core breeding areas, replaced by bustard-friendly alternatives (underground electric cables and passes), or have bird flight diverters attached. These actions can be achieved by declaring priority areas as community or conservation reserves or Eco-sensitive zones through legislation.

3) Community outreach. Local livelihoods should be linked with bustard conservation in priority areas by subsidy/incentive driven agro-environmental schemes that promote bustard-friendly farming practices, such as pesticide-free farming of short palatable crops separated by long fallow periods, and stall feeding of livestock during peak monsoon months. Community outreach to reduce resentment to the species should also be attempted, including providing facilities and services (e.g. local health care) (Anon 2011b, P. Patil *in litt.* 2016). Establish a 'Conservation Reserve' or 'Community Reserve' under Indian law, with a view to financing, retaining and promoting traditional agriculture throughout, aiming at organic and fence-free farming with sustainable livestock levels. In association with NGO-Tiger Watch and Bombay Natural History Society, Rajasthan State Forest Department has also planned a 'Great Indian Bustard Village Guardian Programme'.

4) Provide more support and equipment to park staff, to better protect areas; and establish a volunteer warden programme modeled on those operating in tiger reserves elsewhere in India, to monitor and patrol areas as directed by park/police staff; potentially in conjunction with the army.

5) Consider commencing an *ex situ* conservation breeding programme as an insurance against extinction. Since *in situ* conservation measures will require at least 5-10 years to be implemented and the rapidly declining population trend provides a window of <5 years for procuring eggs from the wild, the implementation of a conservation breeding programme would have to be taken up urgently. However, this is not an alternative to effective habitat management, and is only a mechanism to repopulate extinction-prone small stocks after their habitats have been restored. Importantly, a recent study modelled the species's population dynamics and found that establishing effective *in situ* conservation measures within the next 10 years and not removing eggs from the wild would recruit

more adult females to the wild population within 30 years than a programme of captive breeding and releases (Dolman *et al.* 2015).

6) Regulate and control eco-tourism to minimise disturbance to the species.

7) Consumptive human use should not be permitted during breeding months.

8) Assess the efficacy of these conservation actions by systematic, country-wide population monitoring on alternate years for the next 10 years.

9) Plot all sites at which GIBs have been recorded in the past five years in the area between DNP and Bikaner, and include all land within 20 km of the sites as a means of better defining and in due course managing a 'GIB arc' polygon.Additionally, further research into the life-history patterns and impacts of threats should be continued.

In addition to these broad areas, emphasizing the value of grassland as a fodder resource could be important for protecting the species's habitat particularly in Rajasthan and Gujarat (Anon. 2015).

### Credits

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## Disclaimer

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### **External Resources**

For Images and External Links to Additional Information, please see the Red List website.

## Appendix

## Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
4. Grassland -> 4.5. Grassland - Subtropical/Tropical Dry	Resident	Suitable	Yes
14. Artificial/Terrestrial -> 14.1. Artificial/Terrestrial - Arable Land	Resident	Marginal	-

## Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score	
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.3. Agro-industry farming	Ongoing	Majority (50- 90%)	Slow, significant declines	Medium impact: 6	
	Stresses:	1. Ecosystem stre	esses -> 1.1. Ecosyster	n conversion	
		1. Ecosystem stre	esses -> 1.2. Ecosyster	n degradation	
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.4. Scale Unknown/Unrecorded	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5	
	Stresses:	1. Ecosystem stre	esses -> 1.2. Ecosyster	n degradation	
3. Energy production & mining -> 3.2. Mining & quarrying	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5	
	Stresses:	1. Ecosystem stre	esses -> 1.1. Ecosyster	n conversion	
		1. Ecosystem stresses -> 1.2. Ecosystem degradatio		n degradation	
3. Energy production & mining -> 3.3. Renewable energy	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6	
	Stresses:	1. Ecosystem stre	esses -> 1.1. Ecosyster	.1. Ecosystem conversion	
1. Ecosystem stresses -> 1.2. Ecosy 2. Species Stresses -> 2.1. Species		1. Ecosystem stre	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
		es -> 2.1. Species mor	tality		
		2. Species Stresses -> 2.2. Species disturbance		urbance	
4. Transportation & service corridors -> 4.1. Roads & railroads	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5	
	Stresses:	1. Ecosystem stre	esses -> 1.1. Ecosyster	n conversion	
		1. Ecosystem stre	esses -> 1.2. Ecosyster	n degradation	
4. Transportation & service corridors -> 4.2. Utility & service lines	Ongoing	Majority (50- 90%)	Slow, significant declines	Medium impact: 6	
	Stresses:	1. Ecosystem stre	esses -> 1.1. Ecosyster	n conversion	
		1. Ecosystem stre	esses -> 1.2. Ecosyster	n degradation	
	2. Species Stresses -> 2.1. Species mortality		tality		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.1. Intentional use (species is the target)	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5	
	Stresses:	2. Species Stress	es -> 2.1. Species mor	tality	

<ol> <li>Human intrusions &amp; disturbance -&gt; 6.3. Work &amp; other activities</li> </ol>	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	2. Species Stresses -> 2.2. Species disturbance		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.1. Unspecified species	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Acacia tortilis)	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stre	esses -> 1.1. Ecosyster	n conversion
		1. Ecosystem stre	esses -> 1.2. Ecosyster	n degradation
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Unspecified Gliricidia)	Past, likely to return	Majority (50- 90%)	Slow, significant declines	Past impact
	Stresses:	<ol> <li>Ecosystem stresses -&gt; 1.1. Ecosystem conversion</li> <li>Ecosystem stresses -&gt; 1.2. Ecosystem degradation</li> </ol>		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Canis familiaris)	Ongoing	Majority (50- 90%)	Slow, significant declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
		<ol> <li>Species Stresses -&gt; 2.2. Species disturbance</li> <li>Species Stresses -&gt; 2.3. Indirect species effects -&gt;</li> </ol>		urbance
		<ol> <li>2. Species Stresses -&gt; 2.3. Indirect species effects -&gt;</li> <li>2.3.7. Reduced reproductive success</li> </ol>		cles effects ->
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Prosopis juliflora)	Past, likely to return	Majority (50- 90%)	Slow, significant declines	Past impact
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion		
		1. Ecosystem stre	esses -> 1.2. Ecosyster	n degradation
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Unspecified Eucalyptus)	Past, likely to return	Majority (50- 90%)	Slow, significant declines	Past impact
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion		
		1. Ecosystem stre	esses -> 1.2. Ecosyster	n degradation
8. Invasive and other problematic species, genes & diseases -> 8.2. Problematic native species/diseases -> 8.2.2. Named species (Corvus splendens)	Ongoing	Majority (50- 90%)	Slow, significant declines	Medium impact: 6
	Stresses:	2. Species Stress 2.3.7. Reduced r	es -> 2.3. Indirect spe eproductive success	cies effects ->

## **Conservation Actions in Place**

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions in Place
In-Place Research, Monitoring and Planning
Action Recovery plan: Yes
Systematic monitoring scheme: Yes
In-Place Land/Water Protection and Management
Conservation sites identified: Yes, over entire range
Occur in at least one PA: Yes
Invasive species control or prevention: Yes
In-Place Species Management
Successfully reintroduced or introduced beningly: No
Subject to ex-situ conservation: No
In-Place Education
Subject to recent education and awareness programmes: Yes
Included in international legislation: Yes
Subject to any international management/trade controls: Yes

## **Conservation Actions Needed**

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions Needed
1. Land/water protection -> 1.1. Site/area protection
1. Land/water protection -> 1.2. Resource & habitat protection
2. Land/water management -> 2.1. Site/area management
3. Species management -> 3.1. Species management -> 3.1.1. Harvest management
3. Species management -> 3.4. Ex-situ conservation -> 3.4.1. Captive breeding/artificial propagation
4. Education & awareness -> 4.3. Awareness & communications
6. Livelihood, economic & other incentives -> 6.1. Linked enterprises & livelihood alternatives

6. Livelihood, economic & other incentives -> 6.5. Non-monetary values

### **Research Needed**

(http://www.iucnredlist.org/technical-documents/classification-schemes)

### **Research Needed**

1. Research -> 1.2. Population size, distribution & trends

Research Needed
1. Research -> 1.3. Life history & ecology
1. Research -> 1.5. Threats
3. Monitoring -> 3.1. Population trends

# **Additional Data Fields**

Distribution
Continuing decline in area of occupancy (AOO): Yes
Extreme fluctuations in area of occupancy (AOO): No
Estimated extent of occurrence (EOO) (km <sup>2</sup> ): 12500000
Continuing decline in extent of occurrence (EOO): Yes
Extreme fluctuations in extent of occurrence (EOO): No
Number of Locations: 11-100
Continuing decline in number of locations: Yes
Extreme fluctuations in the number of locations: No
Lower elevation limit (m): 0
Population
Number of mature individuals: 50-249
Continuing decline of mature individuals: Yes
Extreme fluctuations: No
Population severely fragmented: No
No. of subpopulations: 6
Continuing decline in subpopulations: Yes
Extreme fluctuations in subpopulations: No
All individuals in one subpopulation: No
No. of individuals in largest subpopulation: 1-89
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes
Generation Length (years): 15.6
Movement patterns: Not a Migrant

### The IUCN Red List Partnership



The IUCN Red List of Threatened Species<sup>™</sup> is produced and managed by the <u>IUCN Global Species</u> <u>Programme</u>, the <u>IUCN Species Survival Commission</u> (SSC) and <u>The IUCN Red List Partnership</u>.

The IUCN Red List Partners are: <u>Arizona State University</u>; <u>BirdLife International</u>; <u>Botanic Gardens</u> <u>Conservation International</u>; <u>Conservation International</u>; <u>NatureServe</u>; <u>Royal Botanic Gardens</u>, <u>Kew</u>; <u>Sapienza University of Rome</u>; <u>Texas A&M University</u>; and <u>Zoological Society of London</u>.