

INDO-GANGETIC GRASSLANDS

A band of tropical grasslands (locally known as the terai and duars), now highly fragmented, extends across the plains of the Ganges and Brahmaputra rivers and into the adjacent Himalayan foothills. Eleven threatened grassland species occur there, including Bristled Grass-warbler, which is also known from scattered localities (away from the main grassland belt) in Pakistan and the Indian peninsula. Most of these birds inhabit damp lowland grasslands, but a few range into the hills, including Manipur Bush-quail and Slender-billed Babbler in the Manipur basin, and Grey-crowned Prinia, which is found to well over 1,000 m and in forest edge as well as grasslands. Manipur Bush-quail, Marsh Babbler and Black-breasted Parrotbill have restricted ranges, and are confined to the Assam plains Endemic Bird Area, and Finn's Weaver is also highly localised in distribution. The Indo-Gangetic grasslands overlap with two wetland regions, W12 and W14.

- **Key habitats** Tropical grassland along rivers and on plains, and associated scrub and woodland.
- **Altitude** Lowlands to 1,350 m.
- **Countries and territories** **Pakistan; India** (Haryana, Delhi, Uttaranchal, Uttar Pradesh, Bihar, West Bengal, Arunachal Pradesh, Assam, Meghalaya, Manipur); **Nepal; Bhutan; Bangladesh.**

	Threatened species			Total
	CR	EN	VU	
	—	—	8	8
	—	1	1	2
	—	—	1	1
Total	—	1	10	11

Key:  = breeds only in this grassland region.
 = also breeds in other region(s).
 = non-breeding visitor from another region.

The Indo-Gangetic grasslands region overlaps with part of Conservation International's Indo-Burma Hotspot (see pp.20–21).

Almost all grasslands suitable for the threatened birds are in protected areas such as Royal Chitwan National Park in Nepal. PHOTO: OTTO PFISTER





Table 1. Outstanding Important Bird Areas in the Indo-Gangetic grasslands.

IBA name	Status	Territory	Threatened species and habitats
1 Dudwa NP ^{W12}	PA	Uttar Pradesh	Large populations of Swamp Francolin and Bengal Florican
2 Jaldapara WS ^{W14}	PA	West Bengal	Swamp Francolin, Bengal Florican, Slender-billed Babbler, Black-breasted Parrotbill and Finn's Weaver
3 D'Ering Memorial WS ^{F06,W14}	PA	Arunachal Pradesh	Swamp Francolin, Bengal Florican and Black-breasted Parrotbill
4 Manas NP ^{F04,F06,W14}	PA ^{WH}	Assam	Large populations of Swamp Francolin, Bengal Florican and Marsh Babbler, also Slender-billed Babbler and Finn's Weaver
5 Kaziranga NP ^{F06,W14}	PA ^{WH}	Assam	Populations of almost all threatened species of this region
6 Dibru-Saikhowa NP ^{F06,W14}	PA	Assam	Swamp Francolin, Bengal Florican, Marsh Babbler, Jerdon's Babbler and Black-breasted Parrotbill
7 Royal Sukla Phanta WR ^{W12}	PA	Nepal	Large populations of Bengal Florican, Bristled Grass-warbler and (wintering) White-throated Bushchat, Finn's Weaver probably resident
8 Royal Chitwan NP ^{W12}	PA ^{WH}	Nepal	Bengal Florican (small, declining population), Slender-billed Babbler, Grey-crowned Prinia and Bristled Grass-warbler
9 Kosi Tappu WR ^{W12}	PA ^R	Nepal	Large population of Swamp Francolin, breeding Bristled Grass-warbler, records of White-throated Bushchat and Finn's Weaver

One of the IBAs listed for W14, Orang NP, has important breeding populations of Swamp Francolin and Bengal Florican. Note that more IBAs in this region will be included in the *Important Bird Areas in Asia*, due to be published in early 2004.

Key IBA name: NP = National Park; WR = Wildlife Reserve; WS = Wildlife Sanctuary.

Status: PA = IBA is a protected area; (PA) = IBA partially protected; — = unprotected; R = IBA is wholly or partially a Ramsar Site (see pp.31–32); WH = IBA is wholly or partially a World Heritage Site (see p.34); F04/F06 = also supports threatened forest birds of regions F04/F06; W12/W14 = also supports threatened waterbirds of regions W12/W14. White-rumped, Indian and/or Slender-billed Vultures of region G03 have (or had) populations in all IBAs in this region.

OUTSTANDING IBAs FOR THREATENED BIRDS (see Table 1)

The nine IBAs in Table 1 include the largest and richest grasslands remaining in this region, and together support substantial populations of all of the threatened species, apart perhaps from the poorly known Manipur Bush-quail.

CURRENT STATUS OF HABITATS AND THREATENED SPECIES

A huge expanse of grasslands and swamplands once covered much of the Ganges and Brahmaputra basins in northern India, southern Nepal, southern Bhutan and

Bangladesh. Most of these grasslands have been cleared for agriculture and settlements, leaving fragments that are heavily used by people and livestock. The loss of grasslands was particularly rapid following the virtual eradication of malaria in the 1950s. Human usage can be beneficial, as healthy grasslands are usually maintained by the combined effects of fire, flood, cutting and grazing. However, many key grasslands are now threatened by conversion for agriculture and plantations, development, grass harvesting, overgrazing, excessive burning and other pressures.

Typical undeveloped terai habitat in northern India and southern Nepal (mainly *Imperata cylindrica* and *Saccharum bengalense* grasses dotted with isolated trees) has declined precipitously in area and quality. For example, continuous

grassland once extended over 12 districts of Uttar Pradesh, but drastic changes in land-use patterns have left fragments in only six districts, and grasslands have virtually disappeared outside protected areas in Nepal. There are now very few, if any, extensive patches of natural grassland in Bangladesh, where the once-vast reedlands in the north-east were leased out for paper production, settled by people and apparently entirely converted to other land uses. The most extensive remaining grasslands are in Assam; this is the only part of the region where some important grasslands are not yet officially protected.

CONSERVATION ISSUES AND STRATEGIC SOLUTIONS (summarised in Table 3)

Habitat loss and degradation

■ **CONVERSION TO AGRICULTURE AND PLANTATIONS**

Large-scale conversion of natural grasslands into cropland and plantations has taken place throughout. For example, in Uttar Pradesh many grasslands have been replaced by sugarcane, and grasslands in the duars of West Bengal and Assam have been converted for a variety of agricultural uses. Plantations of commercially important timber producing trees such as *Eucalyptus*, *Dalbergia sissoo* and *Tectona grandis* (teak) have replaced large areas of grassland habitat

in India, even inside protected areas (e.g. Valmikinagar Wildlife Sanctuary). Swamp Francolin may be able to survive and even breed in sugarcane fields adjacent to natural grasslands, but in general this conversion results in the almost total loss of specialised grassland birds.

In northern India, natural grasslands on Forest Department land continue to be converted to agriculture, either legally or illegally, but all further conversion needs to be prevented, and the remaining grasslands managed by the Forest Department for the benefit of the threatened birds and other grassland wildlife. The Indian Wildlife Protection Act allows exotic trees to be cut for ecological restoration, even inside protected areas, and this provision should be used to remove eucalyptus and teak plantations (developed during the 1950s and 1960s) from Dudwa National Park; new plantations should not be allowed inside protected areas. Outside protected areas, there has been a tendency to encourage forestry plantations on degraded grasslands, but these areas should be managed to encourage grassland regeneration (unlike forests, high-quality grassland can rapidly be regenerated from disturbed or overgrazed areas).

■ **DAMS AND IRRIGATION**

In many areas, dams and irrigation schemes have altered or eliminated areas of wet grassland. For example, barrages across the Ganges and its tributaries control the annual floods that once maintained broad swathes of riverine grassland; this habitat is now often desiccated, and more easily cleared for agriculture (this loss is only partly offset by the development of *Phragmites* and *Typha* swamps along new irrigation canals, around reservoirs and in the seepage zones of barrage headponds). New dam and irrigation schemes which could affect wet grasslands, and the rivers which feed important grasslands, should be subject to environmental impact assessments, with plans developed to mitigate any negative effects and prevent the loss of wet grasslands. When dams and irrigation projects create new habitats, these should be managed to maximise their value for threatened grassland birds.

■ **DEFORESTATION**

Although clearance of trees is often beneficial to grassland fauna, deforestation is a threat for two threatened birds in this region, Grey-crowned Prinia and Finn's Weaver. The

Swamp Francolin can survive in sugarcane fields, but only near to natural grasslands.



PHOTO: PERWEZ IQUBAL

Table 2. Threatened birds of the Indo-Gangetic grasslands.

Species		Distribution and habitat
Swamp Francolin <i>Francolinus gularis</i>	☉ VU	Inhabits damp grasslands and adjoining agriculture in India, Nepal and (at least formerly) Bangladesh
Manipur Bush-quail <i>Perdicula manipurensis</i>	☉ VU	Known from West Bengal, Assam and Manipur, apparently breeding in tall grasslands, but not conclusively identified since the 1930s
Bengal Florican <i>Houbaropsis bengalensis</i>	☉ EN	Inhabits grasslands in India, Nepal and (at least formerly) Bangladesh
White-throated Bushchat <i>Saxicola insignis</i>	☉ VU	Winter visitor to open short-grass plains in India, Nepal and Bhutan
Marsh Babbler <i>Pellorneum palustre</i>	☉ VU	Inhabits damp grasslands in Arunachal Pradesh, Assam, Meghalaya and Bangladesh
Jerdon's Babbler <i>Chrysomma altirostre</i>	☉ VU	Local in tall riverine grasslands from southern Nepal to eastern Assam
Slender-billed Babbler <i>Turdoides longirostris</i>	☉ VU	Local in damp grasslands from Nepal to Assam and (at least formerly) Manipur
Black-breasted Parrotbill <i>Paradoxornis flavirostris</i>	☉ VU	Dense reeds and tall damp grassland in West Bengal, Arunachal Pradesh and Assam
Grey-crowned Prinia <i>Prinia cinereocapilla</i>	☉ VU	Inhabits forest edge and shrubby grasslands from the plains up to 1,350 m in the terai and Himalayan foothills of India, Nepal and Bhutan
Bristled Grass-warbler <i>Chaetornis striatus</i>	☉ VU	Widespread in damp grasslands in Pakistan, India, Nepal and Bangladesh, but very local and erratic in occurrence
Finn's Weaver <i>Ploceus megarhynchus</i>	☉ VU	Disjunct distribution, with populations in Uttar Pradesh, Delhi (possibly escaped birds) and west Nepal, and others in Assam and West Bengal, in tall grasslands, often with scattered trees

☉ = breeds only in this grassland region; ☉ = also breeds in other region(s); ☉ = non-breeding visitor from another region

prinia prefers lightly wooded grasslands or *Shorea robusta* forest–grassland ecotones, and disappears when all bushes and trees are cleared. Similarly, Finn’s Weaver requires secure trees in which to build its colonies (at least in Uttar Pradesh). Grasslands within the ranges of Grey-crowned Prinia and Finn’s Weaver (which are now mainly within protected areas) need to be managed to retain light woodland and *Shorea robusta* forest for the prinia, and scattered trees for the weaver.

■ GRASS HARVESTING

Grass is a vital resource for rural people in South Asia who use it for fodder, construction (thatch for roofs and wattle for walls), and rope, mats, baskets and other items. Most surviving grasslands, even within protected areas, are heavily harvested. Annual or even biannual harvesting is often beneficial for grassland as it impedes succession to woodland, but over-harvesting damages habitat and creates disturbance. Harvesting needs to be controlled where it is degrading natural grasslands, with alternative materials promoted in communities overly dependent on grassland resources, and timed to avoid disturbance during the breeding season.

■ LIVESTOCK GRAZING

Many grasslands are being degraded by unsustainable grazing pressure, reducing the quality of habitat available to threatened birds; this is especially damaging in summer when post-burn re-growth emerges and water distribution is limited. Overgrazing is a major problem in many protected areas, including Kosi Tappu Wildlife Reserve in Nepal, where large numbers of livestock have caused severe degradation, and Katerniaghat Wildlife Sanctuary in Uttar Pradesh, which supports nearly 10 times more cattle than

Grasslands are heavily utilised by local people, but this needs careful control to prevent habitat degradation.



Grasslands are primarily managed for large mammals in some reserves, but burning to provide fresh grasses may leave insufficient cover for grassland birds.



PHOTO: OTTO PFISTER

stipulated by its management plan. Grazing needs to be managed much more effectively, especially in protected areas. Cessation of grazing is, of course, detrimental to grassland habitat, but grazing (as well as grass harvesting and burning) should be limited and rotational, leaving areas of tall and mid-height grass. The concept of fewer but better-quality livestock should be promoted, particularly near protected grasslands, to reduce grazing pressure.

■ BURNING

Grasslands, even within protected areas, are frequently burnt by people to remove all cover before cultivating or settling the land, or to stimulate fresh growth of grasses for grazing or harvesting. In some protected areas, e.g. Royal Chitwan National Park in Nepal and Kaziranga National Park in Assam, grasslands are primarily managed for large mammals; burning is used to provide fresh grasses for these mammals, but at the expense of many grassland bird species. Annual fires may help prevent succession of grassland to forest, but burning several times a year may alter the composition of grassland, rendering it unsuitable for threatened species, and burning in the breeding season is extremely damaging as nests and eggs are destroyed. In addition, burning is often too comprehensive, leaving no shelter for grassland wildlife. Burning should be rotational, so that a mosaic of patches provides both tall grass for cover and short grass favoured by species such as Bengal Florican as foraging habitat. All burning should be carried out in January or early February in north India and Nepal, before the breeding season, and illegal burning prevented in protected areas. Conservation awareness programmes are required, given the need to manage grass harvesting, grazing and burning to balance the needs of grassland wildlife and sustainable exploitation by local communities. These could aim to explain the importance of properly managed grasslands for wildlife and people, and the value and legal status of threatened species, perhaps using the spectacular Bengal Florican as a flagship for the conservation of the region’s grasslands.

■ DISTURBANCE

Most grasslands, even in protected areas, are subject to high levels of disturbance by people and livestock. In Bangladesh, for example, human population density is very high and most remaining grassland areas are highly fragmented, heavily used and harvested three times a year. In Nepal, people are allowed into protected areas for 7–10 days annually to cut grass, at which time the grasslands are also burned; in the case of Royal Chitwan National Park this involves an influx of 70,000 people. Off-road driving, which is common in

some protected areas, causes additional disturbance. In many areas shy birds such as floricans are constantly flushed and frightened away, and during the breeding season eggs or chicks risk being trodden on by cattle or people. The usage of grasslands in protected areas by people, cattle and all-terrain vehicles needs careful control, particularly while birds are nesting. Steps should also be taken to prevent new settlements in grassland protected areas.

■ **EROSION AND FLOODING**

Heavy flooding, exacerbated by greater run-off from deforested river catchments, is an increasing problem. Seasonal flooding is a natural phenomenon which helps to maintain grassland habitat, but if too heavy or frequent it reduces grassland quality. Floods in Kaziranga and Dibru-Saikhowa National Parks, for example, have washed away large grassy islands and waterlogged other areas, resulting in grasslands becoming overgrown or excessively sandy. Erosion caused by flooding has reduced the extent of grassland in these crucial reserves. Moreover, grassland habitat away from rivers has often been destroyed, leaving no shelter for grassland fauna during floods. This problem is most extreme in parts of Bangladesh, where any grasslands that remain are inundated for two-thirds of the year with no alternative refugia. Sufficient grassland needs to be maintained outside the riverine floodplains to provide habitat for grassland birds during heavy floods, and forest conservation and reforestation are required in the upper catchments in the Eastern Himalayas (see F04).

■ **PESTICIDES**

Agricultural pesticides and herbicides may be affecting grassland birds either by direct mortality or by reduction of

invertebrate prey. Finn's Weaver often nests with Black Drongo *Dicrurus macrocercus*, which protects it from predation by House Crow *Corvus splendens*; however, the drongo appears to be declining in numbers, possibly because of pesticides, which may be allowing increased predation by crows and reducing the weaver's nesting success. The use of agrochemicals should be controlled near important grasslands, with traditional organic agricultural practices encouraged wherever possible.

■ **CIVIL STRIFE AND CONFLICT OVER LAND**

In parts of the region the presence of military or rebellious factions severely reduces opportunities for effective wildlife conservation, even in protected areas such as Manas National Park. The rapidly growing human population is placing extreme pressure on remaining fragments of habitat within many protected areas, and in several reserves conservation action is complicated by multiple land rights claims. Lagga Bagga Sanctuary in Uttar Pradesh once contained high-quality grasslands, but local politicians promised land to encroachers, which generated an influx and rapidly increased deforestation and grazing. This type of land claim in protected areas need to be resolved through careful negotiation involving all stakeholders, to ensure the protection of natural grasslands and other habitats whilst maximising the economic and social benefits to the local communities.

Protected areas coverage and management

■ **GAPS IN PROTECTED AREAS SYSTEM**

There are some large grassland reserves in parts of this region, for example in northern India and Nepal, but elsewhere grasslands are generally poorly represented in

Table 3. Conservation issues and strategic solutions for birds of the Indo-Gangetic grasslands.

Conservation issues	Strategic solutions
Habitat loss and degradation	
<ul style="list-style-type: none"> ■ CONVERSION TO AGRICULTURE AND PLANTATIONS ■ DAMS AND IRRIGATION ■ DEFORESTATION ■ GRASS HARVESTING ■ LIVESTOCK GRAZING ■ BURNING ■ DISTURBANCE ■ EROSION AND FLOODING ■ PESTICIDES ■ CIVIL STRIFE AND CONFLICT OVER LAND 	<ul style="list-style-type: none"> ➤ Prevent further conversion of Indian Forest Department grasslands to agriculture ➤ Restore former grasslands in Dudwa National Park by removing eucalyptus and teak plantations, and prohibit new plantations in protected areas ➤ Encourage the regeneration of degraded grasslands ➤ Assess the environmental impact of new dam and irrigation schemes, with mitigation measures to maintain wet grasslands ➤ Retain the woodland and scattered trees required by Grey-crowned Prinia and nesting Finn's Weaver ➤ Encourage rotational burning, grazing and grass harvesting practices, to provide a mosaic of tall and short grass for nesting and foraging ➤ Avoid grass burning and harvesting during the breeding season, excessive grass harvesting, and overgrazing ➤ Minimise disturbance in grassland protected areas by people, cattle and vehicles, particularly while birds are nesting ➤ Control the use of agrochemicals, and encourage traditional organic farming methods ➤ Resolve land rights claims in protected areas, to ensure the protection of grasslands whilst maximising the local economic and social benefits
Protected areas coverage and management	
<ul style="list-style-type: none"> ■ GAPS IN PROTECTED AREAS SYSTEM ■ WEAKNESSES IN RESERVE MANAGEMENT 	<ul style="list-style-type: none"> ➤ Improve the coverage of grasslands in the protected areas system of Assam ➤ Develop reserve management regimes which balance the conservation of all grassland biodiversity with sustainable use by local communities ➤ Increase resources available for protected areas management, to equip and train staff better
Exploitation of birds	
<ul style="list-style-type: none"> ■ HUNTING ■ WILD BIRD TRADE 	<ul style="list-style-type: none"> ➤ Enforce existing laws to prevent hunting in protected areas, and control gun ownership ➤ Improve the enforcement of laws to prevent trade in Finn's Weaver
Gaps in knowledge	
<ul style="list-style-type: none"> ■ INADEQUATE DATA ON THREATENED BIRDS 	<ul style="list-style-type: none"> ➤ Investigate the optimal grazing, burning, cutting and flooding regimes for key grasslands ➤ Search for Manipur Bush-quail in the Manipur basin and elsewhere ➤ Survey any surviving areas of natural or semi-natural grassland in Bangladesh ➤ Study the distributions of non-breeding Bengal Florican and White-throated Bushchat, and the possible link between pesticide use and predation of Finn's Weaver by House Crow

protected-area systems, e.g. in Assam. New protected areas and extensions to existing reserves should also be considered to improve coverage of the relatively extensive grasslands of Assam. For example, in Assam the Amarapur area near Dibru-Saikhowa National Park should be brought under protection as a satellite core area of the park, and the Deobal-Jalah grassland should be protected.

■ WEAKNESSES IN RESERVE DESIGN AND MANAGEMENT

Many protected areas are small and/or isolated, and surrounded by densely populated and intensively cultivated farmland, and the populations of threatened species which they support are thus susceptible to local extinction. Wherever possible the boundaries of small parks should be expanded, and corridors of grassland restored to link them to other nearby reserves, to improve the chances for long-term survival of the populations of larger birds such as Bengal Florican. The zoning of protected areas is critical, to provide sufficiently large (relatively) undisturbed core areas for their wildlife, as well as ample grassland buffer zones to cater for local people.

The grassland reserves need direct habitat management to maximise their value to wildlife, typically aimed to provide a mosaic of patches of grass of different heights (see *Grass harvesting*, *Livestock grazing* and *Burning* above). In many reserves, it is a major challenge to develop the correct management regime, given the need to balance the conservation of all grassland biodiversity (including large mammals and threatened birds) with sustainable use by local communities. Thus, rotational grazing and burning will be difficult to achieve given the huge number of people involved, but it is vital to bring the cutting and burning regime under greater control. Crucially, rotational management can simultaneously increase herbage production and conserve grassland ecosystems, and thus offers a partial remedy to the key problem of the region's growing livestock population and shrinking pastures. In some protected areas current management practices clearly

need adjustment, e.g. in Royal Chitwan National Park areas of shorter grassland favoured by Bengal Florican are developing into taller *Narenga*- and *Saccharum*-dominated grassland, and eventually to scrub and forest. Conservation measures are difficult to implement in many protected areas because of poor infrastructural facilities and general lack of training and adequate salaries for protected-area staff. To improve their management, grassland reserves require increased manpower and equipment, along with training and better salaries for staff.

Exploitation of birds

■ HUNTING

Trapping and hunting for food remain serious threats in many areas, especially for Swamp Francolin and Bengal Florican. Some 70,000 human families currently rely on the professional trading of wild birds in Uttar Pradesh, India, a country traditionally benign towards wildlife. Socio-economic studies of hunting are required to investigate the impact on bird populations and potential alternative livelihoods. Existing legislation needs to be better enforced in protected areas, with adequate numbers of guards or wardens to patrol the reserves. Control of gun ownership might be a practical method of addressing this problem in rural areas.

■ WILD BIRD TRADE

Swamp Francolins are trapped and sold for cock-fighting, while Finn's Weaver is traded as a cage-bird. Between 200 and 300 Finn's Weaver are traded annually in India, even though trapping and trade of the species has been banned there since 1991. Existing laws to control trapping should be more strictly enforced, with conservation awareness programmes initiated near key sites for Finn's Weaver, to highlight the laws and profile the threatened species amongst trappers and local people. There may also be a need for improved training for enforcers responsible for the control of trapping, and the provision of alternative livelihoods to traditional subsistence bird-trappers.

Gaps in knowledge

■ INADEQUATE DATA ON THREATENED BIRDS

Further research is required to identify the optimal grazing, burning, cutting and flooding regimes in grasslands (both in general and at particular grassland sites), to suit the needs of people and threatened birds. There are many gaps in knowledge of the distribution and status of threatened birds, and surveys are required to identify further key sites for their conservation. Manipur Bush-quail has not been recorded since 1932, and surveys are needed to relocate it in the Manipur basin (which could run alongside searches for the Slender-billed Babbler which was once common in this state) and elsewhere. The current status of threatened grassland birds is poorly known in Bangladesh, and any surviving areas of natural or semi-natural grassland in Sylhet should be searched for Swamp Francolin, Marsh Babbler and Black-breasted Parrotbill. The distribution of Bengal Florican in the non-breeding season deserves study, and a full winter survey is required of White-throated Bushchat in the northern Gangetic plains and Brahmaputra valley, where very few current wintering sites are known. Surveys are required to locate Finn's Weaver colonies and determine measures needed for their protection, with investigations of the effect of trade on wild populations, and of the possible link between pesticide use and increased nest predation by House Crows (see *Pesticides*).

Bengal Florican requires a mosaic of both short grass for foraging and tall grass for cover.



PHOTO: J. C. EAMIES