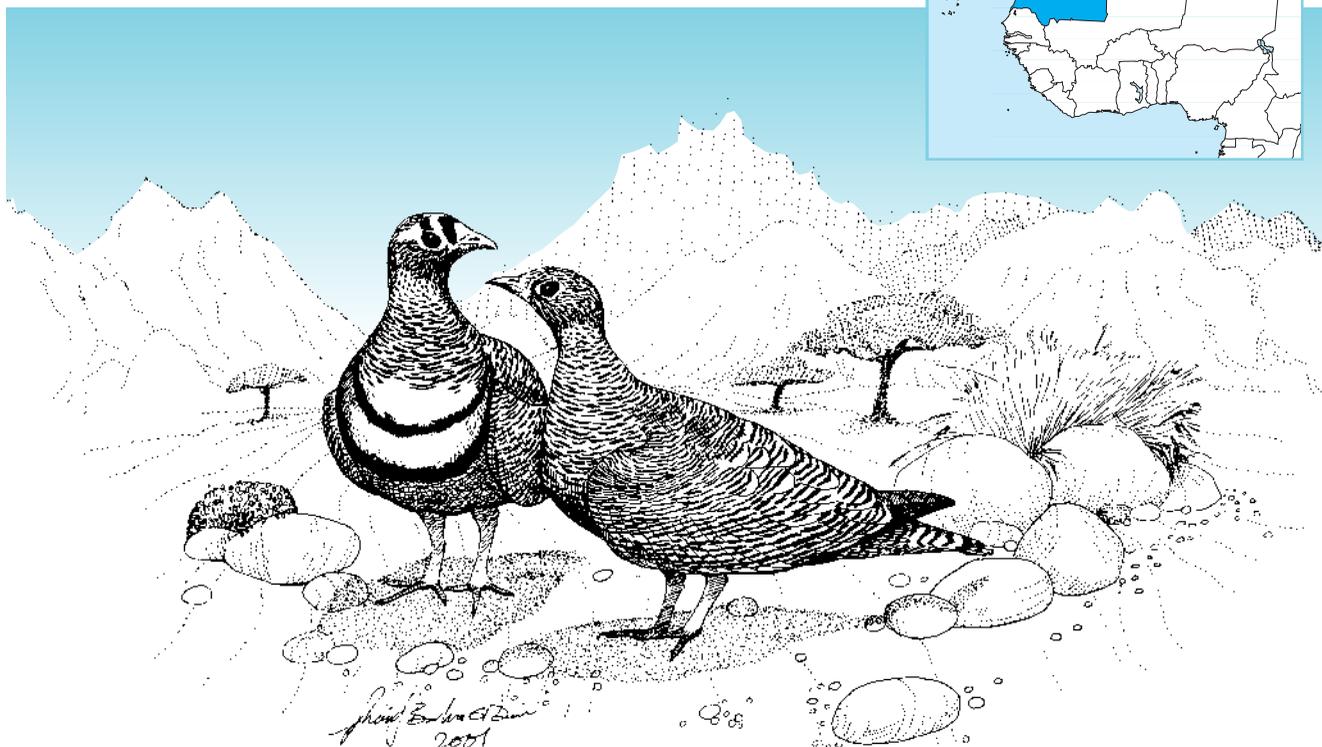


MAURITANIA

TARA SHINE, PETER ROBERTSON AND BRUNO LAMARCHE



Lichtenstein's Sandgrouse *Pterocles lichtensteinii*. (ILLUSTRATION: SHERIF BAHA EL DIN)

GENERAL INTRODUCTION

The Islamic Republic of Mauritania lies on the coast of West Africa, bordered by the Atlantic Ocean to the west, Morocco and Algeria to the north, Mali to the south and east and Senegal to the south. The country extends between 15°N to 27°30'N and 05°40'W to 17°W and covers an area of 1,030,700 km². In 1997 the population was 2.39 million with a birth rate of 2.5%. The population of Nouakchott, the capital, is 850,000.

Eighty-seven percent of the population is classed as sedentary and 13% as nomadic, however the term sedentary includes those that are semi-sedentary, i.e. some members of the family settle while others remain mobile with the livestock. The majority of the population lives in the south of the country, along the Senegal river and in Nouakchott, on the coast. Twenty-one percent of the population lives in Nouakchott, while 45% is classed as rural.

Mauritania has supported a human population for at least 600,000 years. In the course of its history, the country has been invaded, ruled and settled by Berbers and Arabs from North Africa and by the sub-Saharan empires of Mali and Songhai. As a result, Mauritania is inhabited by a great number of ethnic groups. Administratively, the country is divided into 11 regions or Wilayas. Fishing is the major livelihood in coastal regions and, indeed, fisheries are Mauritania's principle economic resource, accounting for 66% of the national revenue. Iron ore, livestock-rearing and agriculture complete the economic base. The rural population is mainly composed of nomadic and semi-nomadic pastoralists and sedentary agro-pastoralists. Livestock-rearing employs 8% and cultivation 78% of the rural population, yet livestock-rearing contributes three times more to gross domestic product than cultivation. The arable land potential is scarcely more than 500,000 ha (less than 1% of the national territory) and rain-fed crops can only be grown in the southern part of the country (Guidimaka and the southern fringes of the two Hodhs).

Mauritania is hot and extremely arid. At Sélîbabi (15°10'N) in the extreme south, mean annual rainfall exceeds 550 mm and the

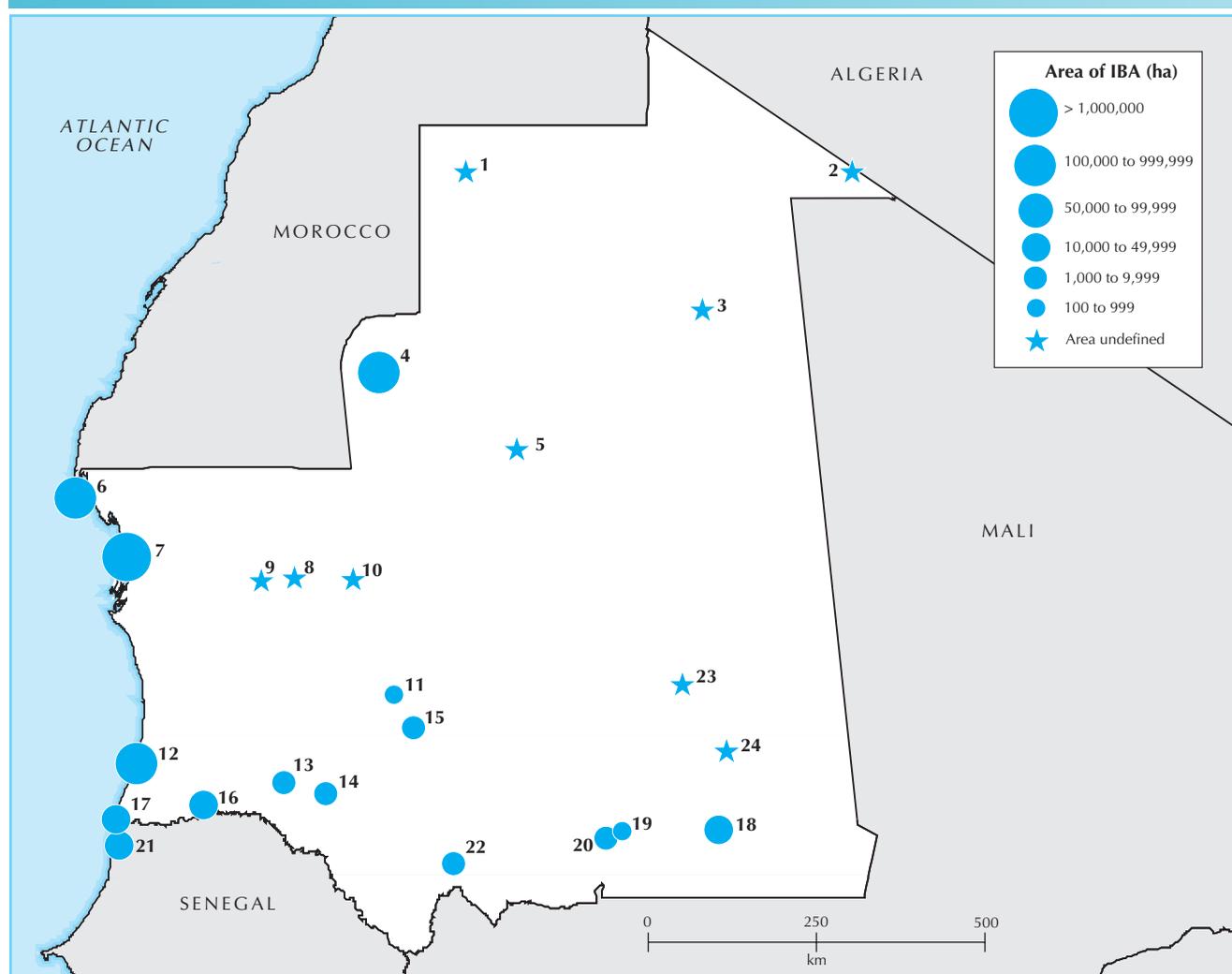
wet season may last from June to October. At Atar (20°30'N), in the centre of the country, rainfall is confined to August and September with an average annual of only 103 mm, while areas north of Fdèrik (22°40'N) are virtually rainless. The mean temperature of the coldest month at Nouakchott, on the coast, is 21°C and that of the warmest month 30°C. Inland, at Atar, the lowest and highest mean monthly temperatures are 20°C and 35°C, respectively.

Mauritania may, on the basis of climate and vegetation, be divided into four regions: the Saharan zone, the Sahelian zone, the coastal zone and the Sudanian zone.

The Saharan zone occupies 810,000 km² or 78% of the national territory. This zone extends from the northern borders of the country as far south as the 150 mm isohyet and excludes the coastal fringe along the Atlantic to the west. As the 150 mm isohyet fluctuates from year to year, so too does the southern fringe of the Sahara, immediately south of which there is a Saharan/Sahelian zone in which the characteristics typical of the two biomes intergrade. The area is characterized by considerable annual and diurnal temperature variations, influenced by the maritime and continental winds. The area is extremely arid and precipitation is low and rendered negligible by elevated temperatures and high evapotranspiration.

The coastal plain, which does not rise above 100 m, extends inland for 250–300 km, where it terminates in an abrupt scarp line which rises sharply to meet a flat interior peneplain lying at 180–230 m above sea-level. The peneplain comprises a number of plateaus separated by broad fossil oueds (wadis) and punctuated by numerous inselbergs. The highest point in the country (915 m) is at Kediet ej Jill, on the western-central part of the interior peneplain. The middle, north and north-east of the country is absolute desert consisting largely of dunes. The coastal plain is an area of vegetated regs, hamadas and oueds interspersed with vegetated dunes.

The Sahelian zone covers 175,000 km² or 17% of the country's surface area. It stretches from the Senegal river in the south-west

Map 1. Location and size of Important Bird Areas in Mauritania.

Table 1. Summary of Important Bird Areas in Mauritania.

 24 IBAs covering at least 17,906 km²

IBA code	Site name	Administrative region	Criteria (see p. 11; for A3 codes, see Table 2)				
			A1	A2	A3	A4i	A4iii
MR001	Tamreikat	Tiris Zemmour	✓		✓		
MR002	Chegga	Tiris Zemmour			✓		
MR003	El Mréiti	Tiris Zemmour	✓		✓		
MR004	Kediet ej Jill	Tiris Zemmour	✓		✓		
MR005	El Ghallâouiya	Adrar	✓		✓		
MR006	Cap Blanc	Dakhlet Nouâdhibou				✓	✓
MR007	Banc d'Arguin National Park	Dakhlet Nouâdhibou, Inchiri	✓	✓	✓	✓	✓
MR008	Ibi (Graret el Frass)	Adrar	✓	✓			
MR009	Arâguib ej Jahfa	Inchiri	✓	✓	✓		
MR010	Wagchogda	Adrar	✓	✓	✓		
MR011	Gabou	Tagant				✓	✓
MR012	Aftoût es Sâheli	Trarza	✓		✓	✓	✓
MR013	Lac d'Aleg	Brakna	✓			✓	✓
MR014	Lac de Mâl	Brakna				✓	✓
MR015	Tâmour en Na'âj	Tagant				✓	✓
MR016	Rkiz	Brakna				✓	✓
MR017	Chott Boul	Trarza	✓			✓	✓
MR018	Gâat Mahmoûdé	Hodh Ech Chargui				✓	✓
MR019	Tâmour de Chlim	Hodh El Gharbi				✓	✓
MR020	Sawana–Oum Lellé	Hodh El Gharbi	✓			✓	✓
MR021	Diawling National Park	Trarza	✓		✓	✓	✓
MR022	Kankossa	Assaba					✓?
MR023	Tinigart	Hodh Ech Chargui	✓	✓			
MR024	Wad Initi	Hodh Ech Chargui	✓	✓	✓		
Total number of IBAs qualifying:			15	11	6	13	14

Table 2. The occurrence of biome-restricted species at Important Bird Areas in Mauritania. Sites that meet the A3 criterion are highlighted in **bold**. Species of global conservation concern are highlighted in **bold blue**.

A02 – Sahara–Sindian biome (14 species in Mauritania; 11 sites meet the A3 criterion)														
IBA code:	001	002	003	004	005	007	008	009	010	012	021	023	024	
<i>Pterocles coronatus</i>	✓	✓	✓	✓	✓		✓	✓	✓			✓	✓	
<i>Pterocles senegallus</i>	✓	✓	✓											
<i>Pterocles lichtensteinii</i>														
<i>Bubo ascalaphus</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	
<i>Alaemon alaudipes</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
<i>Ammomanes deserti</i>	✓	✓	✓	✓	✓	✓		✓						
<i>Ammomanes cincturus</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	
<i>Hirundo obsoleta</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	
<i>Oenanthe lugens</i>				✓										
<i>Oenanthe leucopyga</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	
<i>Turdoides fulvus</i>	✓	✓	✓	✓	✓		✓	✓	✓			✓	✓	
<i>Scotocerca inquieta</i>	✓	✓	✓	✓	✓			✓	✓					
<i>Rhodopechys githaginea</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	
<i>Passer simplex</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	
Number of species recorded:	12	12	12	12	11	8	9	11	10	1	1	9	9	
A03 – Sahel biome (14 species in Mauritania; six sites meet the A3 criterion)														
IBA code:	001	002	003	004	005	007	008	009	010	012	013	021	023	024
<i>Neotis nuba</i>	✓		✓	✓	✓	✓	✓	✓	✓				✓	✓
<i>Ardeotis arabs</i>										✓		✓		✓
<i>Eupodotis savilei</i>														
<i>Streptopelia roseogrisea</i>	✓	✓		✓	✓		✓	✓	✓				✓	✓
<i>Caprimulgus eximius</i>											✓			
<i>Trachyphonus margaritatus</i>														✓
<i>Dendropicus elachus</i>										✓				
<i>Mirafrax cordofanica</i>														✓
<i>Eremalauda dunni</i>					✓									
<i>Cercotrichas podobe</i>							✓	✓	✓	✓		✓		✓
<i>Spiloptila clamans</i>	✓		✓	✓	✓			✓	✓	✓				✓
<i>Anthoscopus punctifrons</i>														
<i>Passer luteus</i>										✓		✓		✓
<i>Lamprotonis pulcher</i>									✓			✓		✓
Number of species recorded:	3	1	2	3	3	2	3	4	5	5	1	4	2	9

eastwards along the Mauritania–Mali border and north to the 150 mm isohyet. Thus, it includes all the regions along the river, the Assaba, most of the Trarza and the vast majority of the two Hodhs. Average rainfall is 200–300 mm per year and vegetation is dominated by Sahelian deciduous bushland (*Acacia* spp., *Leptadenia pyrotechnica*, *Balanites aegyptiaca*, *Ziziphus mauritiana* etc.) and wooded grassland (*Panicum* sp., *Aristida* sp. and *Cenchrus* spp.). This merges northwards into a semi-desert scrub transition zone. The eastern part of this zone includes some 50% of the country's pastoral potential. Further west, along the Senegal river, irrigated and rain-fed agriculture occupies 22,000 km² of the national territory. Elsewhere, the agricultural potential is limited to the southernmost areas where some rain-fed and flood-recession cultivation is possible in years of adequate rainfall.

Mauritania has 815 km of Atlantic coastline and the width of the coastal zone averages 50 km. The coastal zone comprises 25,000 km². It stretches from Keur Macene in the south to Nouadibou in the north. It is characterized by constant humidity, meagre precipitation, low temperatures and only minor annual and diurnal temperature variations. In the north, between Râs Nouâdhâbou (Cap Blanc) and Râs Timirist, the coast consists of rocky headlands, low rock-plains and dunes. In this area the intertidal zone is particularly extensive, with large beds of *Zostera* and *Cymodocea*. Much of this area is included within the Banc d'Arguin National Park, which covers approximately 60 km × 30 km of shallow seas, intertidal and coastal land. South of Râs Timirist the coast is almost entirely sandy.

The Sudanian zone is limited to the extreme south of the country (parts of the Guidimaka) where there is an extended rainy season (four months) and precipitation regularly exceeds 400 mm per year. Only in this region is long-term arable agriculture viable.

ORNITHOLOGICAL IMPORTANCE

A total of 541 species has been recorded in Mauritania (Lamarque 1988). Of these, 196 species are resident and 294 show regular seasonal movements, but do not breed, including 185 Palearctic migrants.

Eleven species of global conservation concern have been recorded in Mauritania, all but two of which are non-breeding visitors from the Palearctic. Only one of these, *Aythya nyroca* (VU), has been reported to occur in any numbers (Lac d'Aleg, 120 in January 1999 and Gâat Sawana, 85 in January 2000). The remainder, *Geronticus eremita* (CR), *Circus macrourus* (NT), *Falco naumanni* (VU), *Crex crex* (VU), *Glareola nordmanni* (NT), *Gallinago media* (NT), *Larus audouinii* (CD) and *Acrocephalus paludicola* (VU), are thought to be uncommon visitors at most and some, such as *G. eremita*, are probably no more than accidental. Of the remaining two, *Neotis nuba* (NT) is still a widespread and relatively common breeding species across the northern parts of the country while *Phoenicopterus minor* (NT) formerly bred in small numbers in the southern coastal flats (the only known nesting site in West Africa), and appears to continue to do so when water conditions are optimal. Breeding was suspected in 1999 and was confirmed in 2000. It is probable that a further species, *Prinia fluviatilis* (DD), will also be found to occur, as it is known from the flood-plain of the Senegal river in Senegal.

No species of restricted range are found, but elements of three biome-restricted assemblages occur. The Sahara–Sindian biome (A02) covers much of the north and centre while the southern third of the country falls within the Sahel biome (A03); 14 species belonging to each biome have been recorded. In addition, elements of the Sudan–Guinea Savanna biome (A04) just penetrate into the extreme south of the country and 12 species of this biome have been recorded.

Mauritania's most important site ornithologically is the Banc d'Arguin, which holds the largest concentration of waterbirds, particularly waders, in West Africa. There are a number of other significant wetlands in the Sahelian zone, many of which are associated with the Senegal river. Recent waterbird censuses have, in addition, revealed that wetlands in the east of the country may hold as many birds as the coastal sites or the better-known western wetlands. Thus, aerial counts in January 2000 revealed 74,188 waterbirds at the coast, 64,811 on the western wetlands (Lower Senegal Delta, Mal, Aleg and Rkîz) and 77,050 in the east, on temporary wetlands.

The numbers and distribution of waterbirds in the country during the northern winter is dependent on rainfall during the preceding wet season; numbers of birds at temporary and semi-permanent wetlands therefore varies considerably annually.

CONSERVATION INFRASTRUCTURE AND PROTECTED-AREA SYSTEM

The Direction de l'Environnement et de l'Aménagement Rural or DEAR (Directorate for the Environment and Rural Development) within the Ministère du Développement Rural et l'Environnement or MDRE (Ministry of Rural Development and the Environment) is responsible for the conservation of waters and forests, the protection of wildlife and the control of hunting. There are two departments within DEAR responsible for the environment and the protection of the country's biodiversity. These are the Service de l'Environnement and the Service de la Gestion des Ressources Naturelles. These bodies must be consulted on any activity liable to change the natural environment and on all questions relating to the protection of soils, water resources, flora and fauna, the conservation and rational use of natural resources, national parks and nature reserves.

There is also a wetlands coordinator at DEAR. The coordinator is responsible for the Wetlands and Waterbirds Monitoring Network (Réseau de Suivi des Zones Humides et des Oiseaux d'eau). This network organizes the national counts as part of the African Waterbird Census, in collaboration with ONC (Office National de la Chasse, France), IUCN and Wetlands International.

National legislation provides for the establishment of protected areas under the Code Concerning Hunting and the Protection of Fauna (Law No. 75-603) and the Forest Code (Ordnance No. 82-171). The following categories of protected area are recognized by this legislation; national park, regional park, faunal reserve, hunting reserve, special reserve, classified forest, forest protection area and reforestation area. In addition, forest clearing is officially prohibited on the slopes of mountains, hills or plateaus where there is a risk of erosion, along banks of permanent or semi-permanent watercourses and head waters, in areas populated with economically important species and in zones protected for public health reasons or for national defence.

The main categories of protected area are:

- Parc national: two National Parks—Parc National du Banc d'Arguin (PNBA) and Parc National du Diawling (PND).
- Réserve de faune: four Faunal Reserves—Réserve de Mouflons, Guelb er Rîchât, El Aft au Gorgol and Tilemsi.
- Réserve intégrale: two Strict Reserves—Cap Blanc or Baie du Levrier which includes Nouâdibou port and Iles Mauritaniennes.
- Réserve partielle de faune: one Partial Faunal Reserve—El Auger.

Faunal Reserves and Partial Faunal Reserves are without management plans or regular surveillance. There are also 30 forêts classées (Forest Reserves) covering 48,000 ha, the majority of which are found along the Senegal river and characterized by *Acacia nilotica* stands. However, surveillance of these forests is difficult to assure and many have suffered from excessive exploitation. The Réserve de Mouflons, Guelb er Rîchât, Tilemsi and El Auger were designated in colonial times. The Monographie Nationale sur la Diversité Biologique recommends that their statute be revised in the near future. El Aft (16,000 ha) has only recently been added to this list.

The forestry code aims to protect Forest Reserves and certain species and to manage the exploitation and promote the plantation of forest resources. A new law passed in 1997 (No. 97.007) replaced

the old code; it redefines the term forest, elaborates the national forestry strategy and assures the protection of ligneous resources. However, the updated code is in need of further review in order to set more realistic goals, thus reducing conflicts between the authorities and local populations.

The responsibility for maritime surveillance, pollution control and the preservation of the coastal environment lies with the Mauritanian Marine Nationale, created in 1966. The National Marine played an important role in the elaboration of the PALM (Plan d'Aménagement du Littoral Mauritanien).

The World Conservation Union (IUCN) has signed an agreement with the Mauritanian government, which provides for cooperation in establishing a national conservation strategy, technical support, and training and help in coordinating activities. A Hunting Association, recognized by the Ministry of the Interior, was established in 1985. The objectives of the association include participation in faunal management and assisting DEAR in controlling poaching.

The government is presently working on a Code de l'Environnement (Environmental Code). The Plan National d'Action pour l'Environnement or PANE (National Environmental Action Plan) was developed through participatory processes, and in accordance with the international conventions, to promote community- and regional-level discussion of environmental problems, to introduce pilot programmes to combat environmental degradation, to promote ecotourism, to encourage the use of alternative fuels and to set up monitoring and evaluating environmental programmes and policies.

INTERNATIONAL MEASURES RELEVANT TO THE CONSERVATION OF SITES

Mauritania has ratified the Convention on Biological Diversity, the Convention to Combat Desertification, the Convention on Climate Change, CITES, the Bonn Convention, the Ramsar Convention (under which three sites have been designated: Banc d'Arguin, Diawling National Park and Chott Boul) and the World Heritage Convention (two sites have been designated, including Banc d'Arguin). Mauritania also participates in UNESCO's Man and the Biosphere Programme.

Regionally, Mauritania is a signatory to the 1968 African Convention on the Conservation of Nature and Natural Resources. Mauritania is represented on the Senegal River Basin Development Authority, which is responsible for producing environmental impact assessments of planned activities relating to the utilization of the river. The authority, in collaboration with the Ministry of Rural Development, undertook feasibility studies that led to the adoption of a management plan for the Mauritanian part of the delta. This plan led to the establishment of Diawling National Park.

OVERVIEW OF THE INVENTORY

This inventory comprises 24 Important Bird Areas (IBAs), covering a minimum total area of over 17,906 km², equivalent to 1.7% of the land surface area of the country (Map 1, Table 1). The areas of nine sites, however, remain undefined. Fourteen sites are principally wetlands, of which four are on the coast, three are associated with the valley of the Senegal river and the rest are relatively isolated water-bodies within the Sahelian region of southern Mauritania. Three of the wetland sites also include terrestrial habitats important for biome-restricted assemblages. In all, 11 sites qualify for their assemblages of species restricted to the Sahara–Sindian biome, between them holding 13 of the 14 such species known from Mauritania while the six sites selected for the Sahel biome hold 11 of its 14 species (Table 2). Only four of the IBAs are protected, although several are being proposed as nationally protected areas and as Ramsar Sites.

There are other potential IBAs about which we have little information. The ephemeral wetlands of the east of the country are highly dynamic ecosystems, the importance of which to birds and other fauna differs from year to year depending on rainfall. Some of these, currently the subject of a research programme, include Tâmour Talî, Tâmour Bougari and Oum El Akriche.

COMMENTS ON THE INVENTORY

- Spelling of place names conforms, where possible, with that used on the *Carte Générale de Mauritanie* (1:2,500,000; IGN, Paris, 1993).
- It is emphasized that the importance to waterbirds of wetlands in semi-arid regions varies greatly from year to year, according to the temporally and spatially variable rainfall patterns during the preceding rainy seasons.

ACKNOWLEDGEMENTS

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International. New data on the east of the country results from aerial and terrestrial observations made by Bruno Lamarche since the early 1980s and the efforts of Project GERNEM since 1999.

GLOSSARY

erg a desert space occupied by dunes.

gâat shallow ephemeral wetland that forms in a shallow depression on a flat plain. Typically with abundant aquatic vegetation and few trees. Substrate more permeable than a tàmourt, hence they are more often exploited for agriculture.

guelta permanent or semi-permanent pool fed from water-bearing fractures in rock.

hamada immense desert plateau, rocky and entirely flat.

oued a wadi, seasonal river, often with associated *Acacia nilotica* and aquatic vegetation.

reg hard, flat, gravel and rocky plain typical of arid areas. The finest elements of the detritus carpet have been carried away by the wind.

sebkha a salty mudflat typical of an arid plain.

tàmourt a temporary wetland characterized by stands of *Acacia nilotica* trees, known as 'amur' in hassaniya. Formed by rainfall collecting in a shallow depression and, typically, with little or no hydrophytes and a clay substrate.

SITE ACCOUNTS

Tamreikat

Admin region Tiris Zemmour
Coordinates 25°23'N 11°20'W
Area Undefined Altitude c.350 m

MR001

A1, A3 (A02)
Unprotected

Site description

The site comprises a 40-km-long crystalline massif lying in the far north-west of the country, close to the Moroccan border. It is aligned north-south and rises 100 m above the surrounding plain. Numerous wadis cut across the massif. Crevices in the steep rock-faces, cliff-edges, shrubs and large trees such as *Acacia raddiana* provide shelter and nesting sites in the incredibly arid conditions. Typical plant species include *Acacia raddiana*, *Rhus tripartita*, *Leptadenia pyrotechnica*, *Maerua crassifolia*, *Salvadora persica*, *Balanites aegyptiaca*, *Panicum turgidum* and *Stipagrostis pungens*, etc.

Birds

See Box and Table 2 for key species. In addition, three species of the Sahel biome have been recorded from this site; see Table 2.

Key species

A1 *Neotis nuba*
A3 (A02) Sahara-Sindian biome: 12 of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

No information. The site is in a very remote and sparsely populated area.

Further reading

Lamarche (1988).

Chegga

Admin region Tiris Zemmour
Coordinates 25°22'N 05°40'W
Area Undefined Altitude c.350 m

MR002

A3 (A02)
Unprotected

Site description

Chegga is an ancient fort and water-source in the north-east of Mauritania, close to the international border with Algeria, on an escarpment known as El Hank. The limestone and chalk cliffs rise 100 m above the surrounding plains. It contains numerous water

springs along the rock-face, and in among the rockfalls and slips are gueltas. The vegetation typical of the area includes: *Phoenix dactylifera*, *Adiantum capillus veneris*, *Hyoscyamus muticus*, *Tamarix* sp., *Acacia raddiana*, *Rhus tripartita*, *Capparis decidua*, *Leptadenia pyrotechnica*, *Maerua crassifolia*, *Salvadora persica*, *Balanites aegyptiaca* and *Panicum turgidum*.

Birds

See Box and Table 2 for key species. In addition, one species of the Sahel biome has been recorded from this site; see Table 2.

Key species

A3 (A02) Sahara-Sindian biome: 12 of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

No information. The site is in a very remote and sparsely populated area.

Further reading

Lamarche (1988).

El Mréiti

Admin region Tiris Zemmour
Coordinates 23°29'N 07°52'W
Area Undefined Altitude c.270 m

MR003

A1, A3 (A02)
Unprotected

Site description

El Mréiti is located on the southern end of the El Hank escarpment in the north-east of the country. It has a permanent water-source that has been exploited by herders and traders for centuries. The cliffs rise 30 m above the surrounding plains. There are numerous wells, deeply gouged wadis and a large sebkha. The vegetation typical of the area includes *Hyoscyamus muticus*, *Tamarix* sp., *Acacia raddiana*, *Capparis decidua*, *Leptadenia pyrotechnica*, *Maerua crassifolia*, *Salvadora persica*, *Balanites aegyptiaca* and *Panicum turgidum*.

Birds

See Box and Table 2 for key species. In addition, two species of the Sahel biome have been recorded from this site; see Table 2.

Key species

A1 *Neotis nuba*

Key species ... continued

A3 (A02) Sahara-Sindian biome: 12 of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

No information. The site is in a remote and sparsely populated area.

Further reading

Lamarche (1988).

Kediet ej Jill

Admin region Tiris Zemmour

Coordinates 22°40'N 12°36'W

Area 110,000 ha Altitude c.250–915 m

MR004

A1, A3 (A02)

Unprotected

Site description

Kediet ej Jill is a steeply sloping rocky escarpment, 20 km by 5 km, which lies to the east of the town of Fdèrik in north-central Mauritania. The escarpment is oriented east–west and rises to 915 m, the highest point in Mauritania. A number of ephemeral watercourses drain from the escarpment to the surrounding desert, and flow westwards into the adjacent Sebkhet ej Jill, just to the west of Fdèrik. The site includes both the sebkhet and the escarpment. The vegetation of the area includes *Phoenix dactylifera*, *Adiantum capillus veneris*, *Hyoscyamus muticus*, *Tamarix* sp., *Acacia raddiana*, *Rhus tripartitus*, *Capparis decidua*, *Leptadenia pyrotechnica*, *Maerua crassifolia*, *Salvadora persica*, *Balanites aegyptiaca* and *Panicum turgidum*.

Birds

See Box and Table 2 for key species. Three species of the Sahel biome have also been recorded; see Table 2.

Key species

A1 *Neotis nuba*

A3 (A02) Sahara-Sindian biome: 12 of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

No information, but lying so close to a centre of human population it is likely that pressures are great.

Further reading

Lamarche (1988).

El Ghallâouïya

Admin region Adrar

Coordinates 21°35'N 10°35'W

Area Undefined Altitude c.330 m

MR005

A1, A3 (A02)

Unprotected

Site description

El Ghallâouïya is situated 75 km north-east of Guelb el Richât in the Adrar region. A winding escarpment links it to the Guelb and, further south, to the Adrar plateau. It is a permanent water-source exploited by nomadic herders. Deep ravines intersect the cliffs and there are many ledges and crevices in the rock-face. The plains are dominated by ergs and isolated dunes, punctuated by wells and sebkhas. The vegetation of the area includes *Hyoscyamus muticus*, *Tamarix* sp., *Acacia raddiana*, *Capparis decidua*, *Leptadenia pyrotechnica*, *Maerua crassifolia*, *Salvadora persica*, *Balanites aegyptiaca*, *Panicum turgidum* and *Stipagrostis pungens*.

Birds

See Box and Table 2 for key species. Three species of the Sahel biome has also been recorded; see Table 2.

Key species

A1 *Neotis nuba*

A3 (A02) Sahara-Sindian biome: 11 of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

No information, but lying a mere 75 km from Mauritania's most important tourist area, human pressure on the area may increase in the future.

Further reading

Lamarche (1988).

Cap Blanc

Admin region Dakhlet Nouâdhibou

Coordinates 20°58'N 17°01'W

Area 310,000 ha Altitude 0–5 m

MR006

A4i, A4iii

Strict Reserve

Site description

The protected area is called the Réserve Intégrale de Cap Blanc and covers 310,000 ha. It is the largest of several bays north of the Banc d'Arguin and the reserve. The bay is bordered to the west by the long, southerly projecting peninsula which terminates in Râs Nouâdhibou or Cap Blanc and which is bisected lengthwise by the international frontier with Morocco. The southern tip of the peninsula and the surrounding seas form the reserve. The coastline is steep and rocky in places, sandy in others. The site is contiguous with the Banc d'Arguin (site MR004) to the south and close to part of the Moroccan IBA Dakhla National Park (site MA046). Cap Blanc (also called Aguerguer), is part of a peninsula, lying between the railway line (from the iron-ore mines in Zouérate to the coast at Nouâdhibou) and the ocean. The geology of the Cap is predominantly sandstone and limestones. It is characterized by numerous bays, islands and rocky outcrops. The vegetation of the terrestrial areas includes *Euphorbia balsamifera*, *Panicum turgidum*, *Frankenia corymbosa*, *Echiochilon chazaliei*, *Limonium tuberculatum*, *Spartina maritima*, *Traganum nudatum*, *Salsola baryosma* and *Zygophyllum waterlotii*, while the aquatic and littoral flora includes *Zostera noltii*, *Cymodocea nodosa*, *Suaeda arguinensis*, *Arthrocnemum macrostachyum* and *Sesuvium portulacastrum*. The area receives very little rainfall, on average 24 mm per year; some years there is none.

Birds

See Box for key species. In addition, *Crex crex* has been recorded here while *Larus audouinii* sometimes occurs in small numbers.

Key species

A4i	Breeding (pairs)	Non-breeding
<i>Arenaria interpres</i>	—	1,000 (1979)
<i>Larus fuscus</i>	—	15,000
<i>Larus genei</i>	—	150 (1979)
<i>Sterna caspia</i>	—	10,000
<i>Sterna sandvicensis</i>	—	20,000 (1979)
A4iii	More than 20,000 waterbirds are thought to occur regularly at this site.	

Other threatened/endemic wildlife

The reserve is home to the world's largest population (a few hundred individuals) of monk seals *Monachus monachus* (CR). Four species of marine turtle have been recorded (all are globally threatened).

Conservation issues

The caves used by *Monachus monachus* for breeding are believed to be at risk of collapse due to erosion. Political unrest in the area means that implementing conservation measures is difficult. There are reports of fatalities of *Monachus monachus* due to entanglement in fishing nets. There are also problems of disturbance by tourists and fishing boats.

Further reading

Amadou Tidane *et al.* (1995), Diop (1995), Ens *et al.* (1989), Marchessaux and Mulher (1989), MDRE (1998), Nieri *et al.* (1996).

Banc d'Arguin National Park
MR007
Admin region Dakhlet Nouâdhibou, Inchiri

Coordinates 20°07'N 16°16'W A1, A3 (A02, A03), A4i, A4iii

Area 1,173,000 ha National Park, Ramsar Site,

Altitude 0–15 m World Heritage Site

Site description

Banc d'Arguin National Park was established in 1976 and protects 40% of the Mauritanian coastline, between Nouakchott and Nouâdhibou, on the northern the Mauritanian coast. The National Park includes shallow open sea (<5 m) and seagrass beds, intertidal flats, channels and creeks, as well as coastal desert habitats. Within the park the maximum tidal range is 2.0 m, while the average is between 1.2 and 1.7 m. The total area of intertidal mudflats is some 55,000 ha and there are between 60,000–80,000 ha of seagrass beds. Coastal vegetation includes clumps of mangrove *Avicennia africana* as well as the grass *Spartina maritima* and species of Chenopodiaceae. The terrestrial part of the reserve includes areas of Saharan vegetation, principally the tree species *Acacia tortilis*, *Balanites aegyptiaca*, *Maerua crassifolia* and *Capparis decidua*, and the herbaceous species *Panicum turgidum*, *Cassia italica*, *Pergularia tomentosa* and *Heliotropium bacciferum*. The dunes on the southern fringe of the park are dominated by *Stipagrostis pungens*, *Cornulaca monacantha*, *Euphorbia balsamifera* and *Calligonum comosum*. A total of 190 plant species have been recorded in the park. Adjacent to the park lies one of the world's richest fishing grounds, resulting from upwellings off Râs Nouâdhibou and Râs Timirist and the prevalence of seagrass beds and other productive shallow-water benthic habitats.

Birds

See Box and Table 2 for key species. The Banc d'Arguin holds the world's largest concentrations of non-breeding waders. There are also substantial populations of breeding waterbirds. It is estimated that as many as 2,250,000 migrant waders winter at this site, which is more than 30% of the estimated total population of waders using the East Atlantic Flyway. In addition, *Circus macrourus* and *Falco naumanni* are occasionally recorded on passage, while small numbers of *Larus audouinii* (up to 15 individuals) are regularly recorded. *Phoenicopterus minor* is an occasional visitor in small numbers.

Key species

A1	<i>Neotis nuba</i>		
A3 (A02)	Sahara-Sindian biome: Eight of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.		
A3 (A03)	Sahel biome: Two of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.		
A4i		Breeding (pairs)	Non-breeding
	<i>Pelecanus onocrotalus</i>	3,080	3,763 (1980)
	<i>Phalacrocorax africanus</i>	—	7,787 (1980)
	<i>Phalacrocorax carbo</i>	4,260	9,395 (1980)
	<i>Egretta garzetta</i>	—	4,418 (1997)
	<i>Egretta gularis</i>	745	2,899 (1980)
	<i>Platalea leucorodia</i>	1,610	18,591 (1980)
	<i>Phoenicopterus ruber</i>	12,940	118,200 (1980)
	<i>Haematopus ostralegus</i>	—	9,176 (1980)
	<i>Pluvialis squatarola</i>	—	23,425 (1980)
	<i>Charadrius hiaticula</i>	—	133,055 (1979)
	<i>Charadrius alexandrinus</i>	—	17,380 (1980)
	<i>Limosa lapponica</i>	—	542,965 (1980)
	<i>Numenius phaeopus</i>	—	25,000 (1972)
	<i>Numenius arquata</i>	—	25,000 (1972)
	<i>Tringa totanus</i>	—	102,266 (1997)
	<i>Tringa nebularia</i>	—	4,030 (1997)
	<i>Arenaria interpres</i>	—	17,081 (1980)
	<i>Calidris canutus</i>	—	365,880 (1980)
	<i>Calidris alba</i>	—	20,556 (1997)
	<i>Calidris minuta</i>	—	43,899 (1980)
	<i>Calidris alpina</i>	—	919,895 (1997)
	<i>Calidris ferruginea</i>	—	226,023 (1997)
	<i>Larus fuscus</i>	—	14,936 (1980)
	<i>Larus genei</i>	1,610	4,305 (1997)
	<i>Sterna nilotica</i>	1,180	—
	<i>Sterna caspia</i>	2,575	5,069 (1997)
	<i>Sterna maxima</i>	5,630	3,340 (1997)

A4i (continued)	Breeding (pairs)	Non-breeding
<i>Sterna sandvicensis</i>	—	9,180 (1979)
<i>Sterna hirundo</i>	40	—
A4iii	Over 2 million waterbirds are regularly recorded at this site.	

Other threatened/endemic wildlife

The large and diverse marine fauna includes a number of taxa of conservation concern; four species of sea-turtle (*Chelonia mydas* (EN), *Eretmochelys imbricata* (CR), *Dermochelys coriacea* (EN), *Caretta caretta* (EN)); the monk seal *Monachus monachus* (CR); and numerous species of cetacean—*Phocoena phocoena* (VU), *Sousa teuszii* (DD), *Tursiops truncatus* (DD), *Grampus griseus* (DD), *Steno bredanensis* (DD), *Orcinus orca* (LR/cd) and *Balaenoptera physalus* (EN). The gazelle *Gazella dorcas* (VU) and the foxes *Fennecus zerda* (DD) and *Vulpes rueppellii* (DD) occur in terrestrial parts of the reserve.

Conservation issues

Banc d'Arguin was designated a National Park in 1976, a Ramsar Site in 1982 and a World Heritage Site in 1989. The main threat to the park is from fishing. Within the park, fishing is currently mainly limited to artisanal fishing by the Imraguen people whose activities have been an integral part of the park's ecosystem for several centuries. Outside the park, however, numerous foreign fishing fleets trawl the deeper waters and the park is under pressure to allow increased fishery activities within its limits. Any such increase may, however, threaten both the conservation value of the park and also its economic importance, as the nursery ground for fish currently exploited outside the park. Recent evidence suggests that some fish-stocks are already over-exploited and there has been some destruction of shallow-water vegetation within the park by the activities of trawlers. A reduction in prey availability is also believed to be a probable reason for the decline of some populations of piscivorous birds. Other threats include pollution from industrial development at Nouâdhibou and the illegal killing of marine turtles.

Further reading

Altenburg *et al.* (1982), Campredon (1987), De Naurois (1969), De Wilde (1988), Ens *et al.* (1989), Gowthorpe *et al.* (1996), IUCN (1992), Mengin and Van Spanje (1989), Price *et al.* (1992), Wolff and Smit (1990), Zwarts *et al.* (1998).

Ibi (Graret el Frass)
MR008
Admin region Adrar

Coordinates 19°50'N 13°50'W

Area Undefined **Altitude** c.400–500 m

A1, A3 (A02)

Unprotected

Site description

Located south of the main road between the towns of Akjoujt and Atâr in the Adrar region, this is an area of rock escarpments and cliffs on the edge of the Adrar plateau. There are numerous wells and springs issuing from faults in the rock. Permanent and semi-permanent gueltas form in rocky basins within the escarpment and a wetland called a grara forms in a large lowland depression at the base of the escarpment after the rains. The vegetation of the area includes *Phoenix dactylifera*, *Hyoscyamus muticus*, *Tamarix* sp., *Acacia raddiana*, *Capparis decidua*, *Leptadenia pyrotechnica*, *Maerua crassifolia*, *Salvadora persica*, *Balanites aegyptiaca* and *Panicum turgidum*.

Birds

See Box and Table 2 for key species. In addition, three species of the Sahel biome have been recorded; see Table 2.

Key species

A1	<i>Neotis nuba</i>
A3 (A02)	Sahara-Sindian biome: Nine of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

There is no information, but being located close to the main road and

in an area of considerable tourist pressure during the cold season, there are likely to be increasing human pressures.

Further reading

Lamarche (1988).

Arâguïb el Jahfa

Admin region Inchiri

Coordinates 19°50'N 14°20'W

Area Undefined Altitude c.350–500 m

MR009

A1, A3 (A02, A03)

Unprotected

Site description

This is an area of rocky outcrops 20 km north of the town of Akjoujt. The main road between Nouakchott and the tourist destination of the Adrar runs right through Arâguïb el Jahfa. It is an area of steep cliffs intersected by ravines. There are numerous wells on the plains between the outcrops as well as many sand-filled wadis. The vegetation provides a rich source of pasture for mobile animal herds and plants typical of the area include *Tamarix* sp., *Acacia raddiana*, *Capparis decidua*, *Leptadenia pyrotechnica*, *Maerua crassifolia*, *Salvadora persica*, *Balanites aegyptiaca* and *Panicum turgidum*.

Birds

See Box and Table 2 for key species.

Key species

A1 *Neotis nuba*

A3 (A02) Sahara–Sindian biome: 11 of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

A3 (A03) Sahel biome: Four of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

There is no information but, as it is located on the main road and just north of the expanding urban area of Akjoujt, it is likely that pressures on the area are increasing.

Further reading

Lamarche (1988).

Wagchogda

Admin region Adrar

Coordinates 19°49'N 12°58'W

Area Undefined Altitude c.350–500 m

MR010

A1, A3 (A02, A03)

Unprotected

Site description

This is an area north of the town of Atâr. It consists of a series of rocky outcrops and cliffs on a broad plain on the northern edge of the Adrar plateau. There are many wells on the plain as well as a large sand-filled wadi. Birds find shelter on the rocky ledges of the cliffs and amongst the shrubs and larger tree species. The vegetation typical of the area includes *Phoenix dactylifera*, *Hyoscyamus muticus*, *Tamarix* sp., *Acacia raddiana*, *Capparis decidua*, *Leptadenia pyrotechnica*, *Maerua crassifolia*, *Salvadora persica*, *Balanites aegyptiaca*, *Panicum turgidum* and *Stipagrostis pungens*. Many of these species are valued by nomadic herders for their grazing and browsing potential.

Birds

See Box and Table 2 for key species.

Key species

A1 *Neotis nuba*

A3 (A02) Sahara–Sindian biome: 10 of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

A3 (A03) Sahel biome: Five of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

There is no information but, as it is located close to an urban and tourism centre, it is likely that pressures on the area are increasing.

Further reading

Lamarche (1988).

Gabou

Admin region Tagant

Coordinates 18°16'N 12°22'W

Area >100 ha Altitude c.300 m

MR011

A4i, A4iii

Unprotected

Site description

Gabou is located in the far west of the Tagant on the border with the Brakna. It is approximately 110 km south-west of Tidjikja. It is a large wetland depression on the northern end of the oued that connects it to Tâmour en Na'aj further south (site MR015). Its size varies from year to year depending on the volume of rainfall received by the watershed. The vegetation typical of the area includes *Acacia raddiana*, *A. ehrenbergiana*, *Capparis decidua*, *Leptadenia pyrotechnica*, *Maerua crassifolia*, *Hyoscyamus muticus*, *Tamarix* sp., *Salvadora persica*, *Balanites aegyptiaca*, *Panicum turgidum* and *Cenchrus biflorus*.

Birds

In the years it receives adequate rainfall, Gabou is an important wetland habitat for Afrotropical and Palearctic waterbirds. Other species observed in large numbers include *Anas querquedula* (14,000), *Anas acuta* (6,000), *Dendrocygna viduata* (8,000), *D. bicolor* (600), *Plegadis falcinellus* (800) and *Plectropterus gambensis* (1,200).

Key species

A4i

Philomachus pugnax

Breeding (pairs)

—

Non-breeding

21,000

A4iii

More than 20,000 waterbirds have been recorded at this site.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

No information.

Further reading

Lamarche (1988).

Aftout es Sâheli

Admin region Trarza

Coordinates 17°22'N 16°08'W

Area 120,000 ha Altitude -2–5 m

MR012

A1, A3 (A03), A4i, A4iii

Unprotected

Site description

Aftout es Saheli is a long, narrow coastal lagoon that extends from just south of Nouakchott for 165 km to finish some 60 km north of St Louis in Senegal. Aftout es Saheli was created during two sea-level changes, which gave rise to two lines of dunes parallel to the ocean, separated by a depression of sebkhas at 1–5 m below sea-level. Only 5–10 km wide, it is isolated from the sea by a line of dunes, but is connected by a tributary to the delta of the Senegal river, which lies to the south. However, the communication with the delta is not permanent and isolation from the sea is not absolute. When the Senegal river is in flood, fresh water flows from it into the lagoon, either along channels or via the flood-plains that lie between the river and the lagoon. Thus, the salinity of the lagoon varies through the year and also from year to year depending on the rains. In years when the lagoon receives no water either from the river or from the sea it dries out completely. Riverine floods and desiccation are the more frequent events, while inundation of seawater is relatively rare.

As the lowest parts of the lagoon are 1.0–1.5 m below sea-level there is some seepage, which floods the lagoon with seawater. There is

also a channel, which bisects the dunes at Chott Boul (site MR017), thereby connecting Aftout to the lower Senegal delta. Before the construction of the Diama dam, the flooding of the Senegal river influenced a varying proportion of Aftout es Saheli. The accidental return of large volumes of water to the area in February 1985, due to the rupture of the dunes at Chott Boul, restored the situation that existed 20 years before. The dunes on the seaward side, which form a barrier of 3 km wide between the lagoon and the sea, are exposed to tides and strong winds. They are therefore highly mobile and the vegetation is restricted to *Zygophyllum*, *Suaeda*, *Tamarix* spp., *Nitraria retusa* and *Ipomoea aquatica*. In contrast, the dunes on the landward side are relatively stable and are mainly covered with the shrubs *Euphorbia balsamifera*, *Nitraria retusa* and *Commiphora africana*. The interdune areas support well-developed vegetation consisting of a variety of forbs, with *Tamarix* sp. on the slopes. *Borassus aethiopum* is also frequent. The edges of the lagoon are dominated by *Arthrocnemum glaucum* and *Tamarix* sp., while areas which have dried out are unvegetated as a result of the formation of saline mudflats (sebkhas). Rainfall varies from less than 100 mm per year in the north to 100–150 mm per year in the south.

■ Birds

See Box and Table 2 for key species. *Phoenicopterus minor* breeds in years with favourable water conditions. Up to 2,000 individuals are regularly recorded; a total of 2,040 was counted in December 2000, of which 350 were juveniles. There is considerable annual variation in the numbers and diversity of waterbirds, dependent largely upon the amounts of fresh water coming into the lagoon from the Senegal river and the amount of seawater coming into Chott Boul. In addition, one species of the Sahara–Sindian biome has been recorded (see Table 2).

Key species

A1	<i>Phoenicopterus minor</i>		
A3 (A03)	Sahel biome: Five of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.		
A4i		Breeding (pairs)	Non-breeding
	<i>Pelecanus onocrotalus</i>	2,100 (1987)	1,945 (1987)
	<i>Phalacrocorax carbo</i>	3,200 (1987)	—
	<i>Phoenicopterus ruber</i>	8,000 (1987)	19,400 (2000)
	<i>Platalea leucorodia</i>	—	850 (1999)
	<i>Anas querquedula</i>	—	120,000 (1987)
	<i>Recurvirostra avosetta</i>	—	1,650 (2000)
	<i>Charadrius alexandrinus</i>	—	6,500 (1987)
	<i>Limosa limosa</i>	—	6,000 (1987)
	<i>Tringa erythropus</i>	—	1,150 (1987)
	<i>Larus cirrocephalus</i>	—	1,500 (1987)
	<i>Larus genei</i>	—	1,880 (1999)
	<i>Sterna nilotica</i>	1,860 (1987)	2,500 (1987)
	<i>Sterna caspia</i>	—	640 (1999)
	<i>Sterna albifrons</i>	—	1,500 (1987)
A4iii	Up to 50,000 waterbirds have been recorded at this site.		

■ Other threatened/endemic wildlife

None known to BirdLife International.

■ Conservation issues

The soils of the area are too saline for agriculture, and the human population is very sparse. However, nomads graze their livestock on the dunes and on the flood-plain of the lagoon. The numbers of these pastoralists was estimated at about 1,000 in 1987. In addition, there are some marine fishermen who live in temporary camps on the beach. There is, therefore, little economic activity in the area. Aftout-es-Saheli is, however, known to be an important nursery for commercial and other fish species. Vital spawning grounds are at risk due to the building of the Diama and Mantali dams which have altered the normal hydrological cycle of the delta. Other threats to the site result from a number of development projects. These include attempts at rice-growing along the Senegal river and in the delta, which have not proved economically viable, but have caused considerable environmental damage. This includes pesticide and fertilizer run-off into the lagoon, which has become concentrated through evaporation.

■ Further reading

Daha *et al.* (2000), De Naurois (1969), Hamerlynck *et al.* (1998), Kelleher *et al.* (1995), Lamarche (1988), Messaoud *et al.* (1998), Roux *et al.* (1977), van Wetten (1990).

Lac d'Aleg

Admin region Brakna

Coordinates 17°06'N 13°59'W

Area 4,275 ha Altitude 30 m

MR013

A1, A4i, A4iii

Unprotected

■ Site description

Lac d'Aleg is situated 5 km to the north-west of the town of Aleg in the south-west of the country. The lake is a closed depression in an old course of the Senegal river fed by rainwater run-off from Oued Katchi, which drains a catchment of 3,420 km². The Katchi is a seasonal watercourse which was formerly a tributary of the Senegal river, but now cut off from it by dunes. The lake is endorheic and semi-permanent and typically varies in depth from 1–2 m at the end of the dry season to a maximum of 3–4 m at the end of the rains. At its maximum size, usually attained in October, it is 22 km long and 4 km wide. The area of the lake varies considerably from year to year depending on rainfall. The vegetation of the lake forms concentric rings in which the central zone is characterized by *Echinochloa stagnina*, *Nymphaea lotus*, *N. oleracea*, *Ipomoea aquatica* and *Aeschynomene pfundii*. Nearer the water's edge *Sesbania rostrata*, *Ammania senegalensis*, *Cynodon dactylon* and *Cyperus erectus* dominate, while in seasonally inundated areas *Bergia suffruticosa*, *Alternanthera sessilis* and *Glinus lotoides* are common. The banks are characterized by woody species such as *Balanites aegyptiaca* and *Capparis decidua* and grasses include *Cenchrus biflorus*, *Cyperus conglomeratus* and *Dactyloctenium aegyptiacum*. The southern edge of the lake is bounded by the Nouakchott–Aleg road. Average annual rainfall is c. 150 mm.

■ Birds

See Box for key species. In addition, there are occasional records of *Falco naumanni*, *Gallinago media*, *Glareola nordmanni* and *Acrocephalus paludicola* from this site. All are thought to refer to birds on passage, although the status of *A. paludicola* is hard to establish. More than 116,000 waterbirds were recorded here in September 1987. *Merops bullocki*, a species of the Sudan–Guinea Savanna biome (A04), has been recorded at this site.

Key species

A1	<i>Aythya nyroca</i>		
A4i		Breeding (pairs)	Non-breeding
	<i>Plegadis falcinellus</i>	—	2,380 (2000)
	<i>Dendrocygna bicolor</i>	—	9,000 (1987)
	<i>Plectropterus gambensis</i>	—	5,000 (1987)
	<i>Anas acuta</i>	—	33,000 (1987)
	<i>Anas querquedula</i>	—	50,350 (1996)
	<i>Aythya nyroca</i>	—	120 (1999)
	<i>Porphyrio porphyrio</i>	—	760 (1999)
	<i>Himantopus himantopus</i>	—	1,613 (1996)
	<i>Sterna caspia</i>	—	335 (2000)
A4iii	More than 20,000 waterbirds have been regularly recorded at this site.		

■ Other threatened/endemic wildlife

None known to BirdLife International.

■ Conservation issues

The soils and vegetation around the lake are much affected by traditional flood-recession agriculture, principally sorghum farming which covers an area of some 2,250 ha of the exposed shores of the lake. This includes the construction of makeshift fences around fields which create obstacles to the wind, causing sand to accumulate. The construction of small dams, particularly on the Oued Katchi, also reduces the volume of water reaching the lake. The *Acacia nilotica* woodland, which previously covered much of the higher ground around the lake, has now been extensively cleared. The herbaceous fringing vegetation is much overgrazed by large numbers of domestic animals. Unregulated hunting of wildfowl, particularly by an urban elite from Nouakchott, an easy 3-hour (240 km) drive away, is an increasing problem.

Projet Lac d'Aleg operated in the area for several years. It focused on maximizing the potential of the natural resources of the area through small-scale village initiatives: wells, dams and dykes, setting up butane gas sales-points, agricultural extension services, etc. This programme has been replaced by project PARP (Projet d'Aménagement Rural en Zone Pluvial), funded by the European Union. Its activities will be centred on supporting micro-projects, small

businesses and local cooperatives, equipping and digging wells, the construction of dams and road/access improvements. The impacts of agricultural development and dam-building need to be considered.

Further reading

Eleyou (1990), Paloc (1960), van Wetten *et al.* (1990), Yésou and Triplet (1996).

Lac de Mâl	MR014
Admin region Brakna	
Coordinates 16°57'N 13°22'W	A4i, A4iii
Area 5,250 ha Altitude c.30 m	Unprotected

Site description

Lac de Mâl is located in a depression in Oued Guélluouâr, 65 km east-south-east of the town of Aleg and south-east of Magta' Lahjar. The lake is permanent and is fed by the seasonal rains from many ephemeral watercourses, primarily Oued Leye which drains a catchment of 700 km². The size of the lake varies from a maximum of about 5,250 ha at the end of the rains to some 870 ha by late in the dry season. A dam has been built across the middle of the lake and is used to control an artificial flooding regime. Water depth varies from 1 m to 4 m with an average of 2 m. Upstream of the dam is the deepest part of the lake which is almost unvegetated. Downstream, the water is shallower and aquatic vegetation is abundant. Concentric rings of vegetation cover almost the entire surface of this part of the lake in a carpet of vegetation. This vegetation is exploited by herders as fodder for their mobile animal herds. The lake is bordered to the north and the south by mobile dunes of red sand, often stabilized by *Prosopis juliflora*, *Leptadenia pyrotechnica* and *Parkinsonia aculeata*. To the east the lake extends into Oued Leye and can extend up to 35 km in length after the rains. Annual rainfall in the area varies from 100 mm to 200 mm.

Birds

See Box for key species. In 1987 four *Geronticus eremita* were seen, presumably wanderers from Morocco. In October 1987, 33,690 waterbirds of 40 species were recorded. *Nettapus auritus* breeds. *Merops bulcocki*, a species of the Sudan–Guinea Savanna biome (A04), has been recorded at this site.

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Anas querquedula</i>	—	20,000 (1998)
<i>Anas acuta</i>	—	16,000 (1984)
<i>Porphyrio porphyrio</i>	—	1,060 (2000)
A4iii	More than 20,000 waterbirds have been recorded at this site.	

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

Fuelwood-cutting and overgrazing have reduced the area of woodland around the lake and the cover of herbaceous vegetation, exposing the soil to erosion. The dwindling amount of vegetation cover on surrounding dunes has increased the risk of the dunes shifting and filling in the lake. The European Union funds the Projet Lac de Mal. The project's activities are centred on tree-planting to stabilize the dunes around the lake, the rehabilitation of the dam, the introduction of fish, the building of a cereal bank and the improvement of road access to the area. The environmental impacts of fish introduction, planting of introduced tree species and of repairing the dam need to be assessed.

Further reading

Eleyou (1990), Jaouen and Lamarche (1983), van Wetten *et al.* (1990).

Tâmourt en Na'âj	MR015
Admin region Tagant	
Coordinates 17°51'N 12°07'W	A4i, A4iii
Area >1,000 ha Altitude c.100 m	Unprotected

Site description

Tâmourt en Na'âj is situated on Wadi el Abiod in the mountainous

area of the Tagant plateau. The wadi and associated wetland depressions stretch over a length of 25 km. Huge mobile dunes cover large parts of the area. The tâmour is formed by the narrowing of an ancient river valley north of M'Beika; the water flowing towards Gabou (site MR011) is retained firstly in the depression of Tâmour en Na'âj. There is a dam north of Tâmour en Na'âj, between it and Gabou, and although it retains the water for a time it does not influence the water-level in the tâmour. The vegetation of the area includes *Phoenix dactylifera*, *Acacia nilotica*, *A. raddiana*, *A. ehrenbergiana*, *Capparis decidua*, *Leptadenia pyrotechnica*, *Maerua crassifolia*, *Hyoscyamus muticus*, *Tamarix* sp., *Salvadora persica*, *Balanites aegyptiaca*, *Panicum turgidum* and *Cenchrus biflorus*. Average annual rainfall is c.200 mm.

Birds

The importance of the wetland for waterbirds varies from year to year, depending on the amount of rainfall received. Other species observed in large numbers include *Dendrocygna viduata* (9,000), *D. bicolor* (1,200), *Plectropterus gambensis* (1,200) and *Plegadis falcinellus* (1,300).

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Anas querquedula</i>	—	24,000 (2000)
<i>Anas acuta</i>	—	11,000 (2000)
<i>Philomachus pugnax</i>	—	24,000 (2000)
A4iii	More than 20,00 waterbirds have been recorded at this site.	

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

Currently over 600 families live in the valley occupied by Tâmour en Na'âj, the majority of whom live in the villages of M'Beika, Matmâta and El Mechra. The local population uses the tâmour as a source of fodder and water for the animals, as a source of drinking water, for flood-recession agriculture and for its wild foods and medicinal plants. A primary concern, however, is the increasing human pressure resulting from sedentarization of nomads. The settling of the population near the wetland has increased demands on the natural resources; cutting trees for construction wood and firewood and clearing land for agriculture. The encroachment of the mobile dunes into the wetland depression is another growing concern. The *Acacia nilotica* woodland has diminished in size over the years and there is inadequate evidence of natural regeneration.

Further reading

van Wetten *et al.* (1990).

Rkîz	MR016
Admin region Brakna	
Coordinates 16°45'N 15°10'W	A4i, A4iii
Area 16,500 ha Altitude -3–1 m	Unprotected

Site description

Rkîz is situated approximately 90 km north-east of the town of Rosso. It is a depression 34 km long and 4–6 km wide aligned north-east–south-west. It is filled by water from the Senegal river and, to a lesser extent, from run-off due to rainfall. Two swamps, the Nasio and the Laouwaya, join Rkîz to the river system. The eastern part of the lake is 3 m below sea-level and the western 2 m below. The lake has dried out completely in drought years. The construction of a dam in the Laouwaya, as well as a dyke at Nasio, has limited the natural filling of the lake and reduced the area of the lake to 6,100 ha. The whole area is now managed by a system of dams and dykes for the cultivation of rice.

The transformation of the lake into an agricultural zone has led to the loss of most of the original vegetation. The northern part of the lake remains the most species-rich. It is dominated by *Cassia tora*, with *Nymphaea* sp., *Mimosa pigra*, *Indigofera oblongifolia*, *Echinochloa pyramidalis* and *Aeschynomene* sp. The banks are typically covered with grasses such as *Cynodon dactylon*, *Dactyloctenium* and *Eragrostis* spp. Elsewhere, remaining trees include *Acacia raddiana* and *A. senegal* as well as *Leptadenia pyrotechnica*. Following clearance for agriculture

Calotropis procera has colonized much of the area and is now the dominant ligneous species. In the south-west there are some saline soils with *Tamarix senegalensis*. In the south-east, where the oueds lead to Nasio and Laouwaya, some stands of *Acacia nilotica* still persist, due to seasonal flooding via the rice-fields.

■ Birds

The number of birds present at this site is largely dependent on rainfall and on the quantity of river water allowed in through the dykes. Other counts have included 1,800 *Limosa limosa* and 410 *Plectropterus gambensis* in 1987, while in November 1999 an aerial survey recorded 43,600 waterbirds.

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Anas querquedula</i>	—	27,800 (1999)
<i>Anas acuta</i>	—	10,000 (1975)
<i>Porphyrio porphyrio</i>	—	206 (2000)
A4iii	More than 20,000 waterbirds have been recorded at this site.	

■ Other threatened/endemic wildlife

Crocodylus niloticus and *Hippopotamus amphibius* are reported to be present in the area; both are nationally threatened.

■ Conservation issues

The traditional multi-use management systems, which included flood-recession cultivation of sorghum and livestock-rearing, have been replaced by more intensive agricultural systems. Although levels of rice production at Rkiz are higher than along the Senegal river (1.9 versus 1.5 tonnes/ha/year), this does not compensate for the loss of pastureland and livestock production. In fact, the expansion and intensification of agriculture has been to the detriment of the animal herding in the area. Conflicts between farmers and herders have increased, fishing is seriously affected as water-levels are too low, the water is increasingly polluted by fertilizers and pesticides, while felling of the *Acacia nilotica* woodland for fuel- and construction-wood and to clear land for agriculture has significantly reduced habitat suitable for tree-roosting species such as *Nycticorax nycticorax*. Only a few roosting sites remain today.

■ Further reading

Roux (1976), van Wetten (1989).

Chott Boul

Admin region Trarza

Coordinates 16°34'N 16°26'W

Area 15,500 ha Altitude 2–6 m

MR017

A1, A4i, A4iii

Ramsar Site (unprotected)

■ Site description

Chott Boul is a coastal wetland formed by an ancient mouth of the Senegal river, now isolated from it and with only temporary connections to the sea (behind a 10-km strip of coastal dunes). It lies 175 km south of Nouakchott and 70 km west of Rosso. The total area is approximately 15,500 ha, of which 7,000 ha is a marine zone of mudflats, intertidal saltmarsh, fresh water and brackish zones. The terrestrial zone is made up of 8,500 ha of wetland, floodable plains with temporary and permanent swamps, lakes and marshes of brackish to hyper-saline water. Fresh water enters the system between September and November from Hassi Baba swamp, part of the Diawling-Tichillit system within Diawling National Park (site MR021). Thus, the southern edge of Chott Boul is contiguous with Diawling while Aftout-Es-Saheli (MR012) lies immediately to the north and is fed by a swamp connecting the Grand Lac at Chott Boul with the southern flood-plain of the Aftout.

Other than for this swamp, Chott Boul is limited to the north by mobile and stable dunes and to the east by a flood-plain and rice-fields. The dunes to the north are covered by *Euphorbia balsamifera* and *Tamarix senegalensis*. The northern part of the site is an unvegetated, flat saltpan, which may once have been an area of mangroves. The south is characterized by halophytic vegetation, the remnants of flood-plain forests (*Acacia nilotica*, *Tamarix senegalensis*) and grasslands (*Sporobolus robustus*, *Vetiveria nigritana* and *Juncus rigidus*).

■ Birds

See Box for key species. In addition, Chott Boul is one of the only sites where *Podiceps nigricollis* overwinters in the area; 180 were recorded in December 1998. Counts of other species include 4,000 *Larus fuscus* in 2001. Chott Boul and the southern parts of Aftout es Saheli hold only known nesting colony of *Phoenicopterus minor* in West Africa (see site MR012).

Key species

A1	<i>Phoenicopterus minor</i>	Breeding (pairs)	Non-breeding
A4i	<i>Phoenicopterus ruber</i>	—	1,543 (2001)
	<i>Anas clypeata</i>	—	4,590 (2001)
	<i>Recurvirostra avosetta</i>	—	5,650 (2001)
	<i>Limosa limosa</i>	—	7,900 (2001)
	<i>Larus genei</i>	—	800 (2001)
	<i>Sterna caspia</i>	—	986 (2000)
A4iii	More than 20,000 waterbirds occur regularly at this site.		

■ Other threatened/endemic wildlife

The canids *Fennecus zerda* (DD) and *Vulpes pallida* (DD) occur, as does the nationally vulnerable *Varanus griseus*.

■ Conservation issues

Chott Boul is currently protected by the Marine Nationale as a maritime surveillance zone. The site receives a managed inflow of fresh water from Diawling National Park (site MR021), in collaboration with the OMVS (Organisation de mise en valeur du Fleuve Senegal), in September–October each year. A few nomad families who graze sheep and goats and collect salt inhabit the area. Artisanal fishermen, visit the permanent lakes. Hunting, particularly of pelicans, is believed to be a problem. Visitors from nearby urban centres are responsible for poaching and dumping in the area. The main threats, however, come primarily from development projects and include the intensification of agriculture, resulting in ingress of fertilizer-rich waste water from rice-fields, and accumulation of pesticides from agricultural pest-control. Such contaminants would become concentrated through evaporation. Another risk comes from the possible expansion of intensive shrimp fishing that occurs in the marshes and swamps in the delta. This form of fishing uses very fine nets (20 mm mesh) and poses a risk to fish stocks as large numbers of juvenile fish are destroyed.

■ Further reading

De Naurois (1969), Hamerlynck and Ould Samba (1995), IUCN (1999), Measson (2001).

Gâat Mahmoûdé

Admin region Hodh ech Chargui

Coordinates 16°25'N 07°38'W

Area 16,200 ha Altitude 185–205 m

MR018

A4i, A4iii

Unprotected

■ Site description

Gâat Mahmoûdé is a large, seasonally flooded plain that lies 40 km south-west of the town of Néma in the south-east of the country. The lake is fed by rainwater, which flows into it from a number of oueds to the east that carry run-off from Dahr Néma, the extensive scarp system that lies immediately east of Néma town. The western part of the site, known as the Amzingui and covering c. 2,500 ha, is a depression 0.75–1.00 m deeper than the rest of the wetland. The gâat has in the past contained water continuously for several years. Increased precipitation since 1999 has seen the lake become semi-permanent once again. Aquatic plants include *Ipomea aquatica*, *Nymphaea*, *Cyperus* and *Typha* spp. Rocky outcrops sloping towards the depression border the silty-clay soils of the gâat. Around the gâat are large continental dunes of low elevation, vegetated with species such as *Acacia raddiana*, *A. ehrenbergiana*, *Balanites aegyptiaca* and *Leptadenia pyrotechnica*. Parts of the seasonally inundated area, east of Amzingui, support stands of *Acacia nilotica* woodland (1,200 ha) while the wadis are well-wooded in places. Average annual rainfall in the area is 100–200 mm.

■ Birds

See Box for key species. Twenty-four *Aythya nyroca* were recorded in 2000. In addition, *Acrocephalus paludicola* has been recorded at this

site, but its status is unclear. Although there are few records of terrestrial species, the habitat suggests that the site might hold a significant number of species representative of the Sahel biome.

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Tachybaptus ruficollis</i>	—	573 (2000)
<i>Plegadis falcinellus</i>	—	4,800 (2001)
<i>Dendrocygna viduata</i>	—	21,280 (2000)
<i>Sarkidiornis melanotos</i>	—	10,100 (2001)
<i>Anas querquedula</i>	—	21,600 (2001)
<i>Balearica pavonina</i>	—	860 (2000)
<i>Porphyrio porphyrio</i>	—	340 (2001)
<i>Himantopus himantopus</i>	—	13,200 (2001)
<i>Glareola pratincola</i>	—	2,457 (2000)
<i>Philomachus pugnax</i>	—	22,000 (2001)
<i>Chlidonias leucopterus</i>	—	4,000
A4iii	More than 20,000 waterbirds have been recorded at this site.	

Other threatened/endemic wildlife

The fox *Vulpes rueppelli* (DD) and the tortoise *Geochelone sulcata* (VU) occur, and there are reports that *Gazella dorcas* (VU) is also present.

Conservation issues

Gâat Mahmoûdé has been proposed as a Ramsar Site. Mahmoûdé plays a vital role in the local economy. Mobile animal herds from all over eastern Mauritania visit the wetland to drink. Grazing pressure increased in the 1970s and 1980s as the area of inundation and regeneration of vegetation decreased as a result of declining rainfall. But improved rainfall during 1998–2000 has seen the wetland regenerate and pressures on resources reduced. There is some limited traditional flood-recession agriculture to the north of the wetland. Local populations also exploit the forestry products and wild foods (wild rice, tubers, medicinal plants) associated with the wetland. There is, however, little permanent human habitation in the area. The level of poaching in the area is unknown, but may pose a potential risk to the avifauna.

Further reading

van Wetten *et al.* (1990).

Tâmourt de Chlim

Admin region Hodh El Gharbi
Coordinates 16°25'N 09°03'W
Area 500 ha Altitude 160 m

MR019

A4i, A4iii
Unprotected

Site description

Chlim is 70 km east of Ayoûn, the regional capital of Hodh El Gharbi and 4 km south of the main road to Néma. There are several small villages close to the wetland: Chlim, El Hedra, Oum Lahyadh, Tîmzîne, etc. This tâmour is a temporary shallow wetland characterized by the presence of *Acacia nilotica*. Seasonal rains gather in the clay-lined depression to form the wetland, the duration of which is dependent on the amount of rainfall and ranges from three to six months, with an average depth of 2 m. Aquatic plants include *Nymphaea* sp., *Ipomoea aquatica* and *Cyperus* sp. The transition zone is characterized by *Bergia suffruticosa*, *Sesbania pachycarpa*, *Sporobolus helvolus* and *Echinochloa colona*. *Acacia nilotica* and some *Ziziphus mauritiana* also occur here. The surrounding dunes support *Acacia senegal*, *A. ehrenbergiana*, *Balanites aegyptiaca* and *Calotropis procera*. Herbaceous plants include *Cenchrus biflorus*, *Dactyloctenium aegyptium*, *Cyperus jemicus* and *Aristida funiculata*. Annual rainfall ranges between 150 and 200 mm.

Birds

See Box for key species. Breeding species include *Tachybaptus ruficollis* and *Porphyrio porphyrio*. *Ciconia ciconia* and *Neophron perconopterus* (50 juveniles in December 1999) are frequent visitors.

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Anas querquedula</i>	—	23,700

A4iii More than 20,000 waterbirds have been recorded at this site.

Other threatened/endemic wildlife

The nationally threatened reptile *Varanus griseus* occurs.

Conservation issues

Chlim was proposed as a Ramsar Site in 2000. The tâmour is an important source of water and fodder for, on average, 6,000 animals per day. There is a small amount of traditional flood-recession agriculture on the north-eastern side. The local populations collect, use and sell forestry products, wild foods and medicinal plants. The wetland, like most in the region, is unprotected and managed by the local users. Pressures on the wetland are increasing with the surrounding population.

Sawana–Oum Lellé

Admin region Hodh El Gharbi
Coordinates 16°20'N 09°17'W
Area c.1,200 ha Altitude 160 m

MR020

A1, A4i, A4iii
Unprotected

Site description

Gâat Sawana (more than 800 ha) and Tâmour Oum Lellé (more than 400 ha) are located 67 km south-east of the regional capital, Ayoûn. Gâat Sawana is a clay depression on an open plain where seasonal rains accumulate. It is an important area for traditional flood-recession agriculture. When flooded, it presents a large open expanse of water with abundant aquatic vegetation. Rainwater is fed in from two wadis and water reaches a depth of up to 1 m. Water is retained in the depression for five to eight months. The sandy zone around the depression supports grasses such as *Cenchrus biflorus*, *Panicum* and *Aristida* spp. and trees and bushes including *Leptadenia pyrotechnica*, *Balanites aegyptiaca* and *Acacia raddiana*. The vegetation of the floodable zone includes *Heliotropium* sp., *Indigofera* sp., *Eragrostis tremula*, *Sesbania leptocarpa* and *Cyperus esculentus*, while the aquatic zone on clay soils supports *Cyperus* sp., *Nymphaea* sp., *Sporobolus helvolus*, *Oryza barthii* and *Ipomoea aquatica* with *Acacia nilotica* and *Ziziphus mauritiana*.

Oum Lellé lies 11 km north of Sawana in another clay-lined depression. The tâmour is deeper than the gâat, holds water for longer and is characterized by a woodland of *Acacia nilotica* in the centre of the depression and by the absence of aquatic vegetation. The surrounding area is a zone of rich pastoral land dominated by grasses such as *Cenchrus biflorus*, *Panicum* and *Aristida* spp. while trees and shrubs include *Acacia raddiana*, *A. ehrenbergiana*, *Balanites aegyptiaca* and *Leptadenia pyrotechnica*.

Birds

See Box for key species. In January 2000, 85 *Aythya nyroca* and 17,000 *Anas querquedula* were recorded at this site.

Key species		
A1	Breeding (pairs)	Non-breeding
<i>Aythya nyroca</i>	—	—
A4i		
<i>Himantopus himantopus</i>	—	2,135 (2000)
<i>Gallinula chloropus</i>	—	1,000 (1999)
<i>Porphyrio porphyrio</i>	—	200 (2000)
A4iii	More than 20,000 waterbirds have been recorded at this site.	

Other threatened/endemic wildlife

The tortoise *Geochelone sulcata* (VU) occurs.

Conservation issues

The twin sites have been proposed as a Ramsar Site. Sawana is the second most productive agricultural zone in Hodh El Gharbi. The agriculture practised is flood-recession cultivation of, predominantly, sorghum. Oum Lellé is a daily watering hole for at least 12,000 animals and is one of the most important sources of surface water in the region. A traditional agreement divides activities between the two wetlands; Oum Lellé is reserved for animal herding and Sawana for agriculture. Due to this traditional management the wetlands are currently in good 'health', but appropriate management plans would help reduce threats posed by the expansion of agriculture and the subsequent clearing of land and habitat loss.

Diawling National Park

Admin region Trarza

Coordinates 16°13'N 16°23'W

Area 15,600 ha Altitude 0–6 m

MR021

A1, A3 (A03), A4i, A4iii
National Park

Site description

Situated in the extreme south-west of the country, Diawling National Park lies on the border with Senegal at the mouth of the Senegal river. A buffer zone and a peripheral zone cover a further 19,500 ha, which includes both Aftout es Saheli (site MR012) and Chout Boul (site MR017).

The park is contiguous with Djoudj National Park (IBA SN001) in Senegal, on the opposite bank of the river. The site includes a lagoon which is fed by brackish water from a tributary of the Senegal river, significant estuarine and intertidal areas, saline flats and a small area of mangroves, as well as dunes, alluvial plains and an interconnecting network of rivers lakes and ponds. The western border of the park is formed by dunes. Tree cover on the dunes includes *Acacia tortilis*, *A. senegal*, *Euphorbia balsamifera* and *Balanites aegyptiaca*, with a herbaceous cover of *Cenchrus biflorus*, *Chloris prierii* and *Schoenefeldia gracilis*. Tree cover is more varied and abundant towards the inland edge of the dunes, with *Borassus aethiopum*, *Acacia nilotica*, *A. seyal* and *Parkinsonia aculeata*. There is little cover on the alluvial plains, but *Tamarix senegalensis* and *Arthrocnemum glaucum* occur on sandy knolls and *Acacia nilotica* beside creeks and pools. Herbaceous cover on the lower zones of the plain is dominated by halophytes, such as *Salsola baryosma*. The grass *Sporobolus robustus* is common in the most frequently flooded areas. Grasses are more important in less saline areas, with *Echinochloa colona* and *Vetiveria nigriflora* in depressions and *Schoenefeldia gracilis* on higher ground. Average annual rainfall is 300 mm (although between 1970 and 1990 it fell to 150 mm).

Birds

See Box and Table 2 for key species. In January 1997, 8,000 *Phoenicopterus minor* were recorded (Measson 2000). The area, especially when considered in conjunction with Djoudj National Park (IBA SN001) in Senegal, is extremely important for a wide diversity of waterbirds. A single species of the Sahara–Sindian biome (A02) has been recorded (see Table 2).

Key species

A1	<i>Phoenicopterus minor</i>		
A3 (A03)	Sahel biome: Four of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.		
A4i		Breeding (pairs)	Non-breeding
	<i>Pelecanus onocrotalus</i>	—	24,613 (2000)
	<i>Casmerodius albus</i>	—	509 (2000)
	<i>Platalea leucorodia</i>	—	481 (2000)
	<i>Platalea alba</i>	—	700 (1975)
	<i>Phoenicopterus ruber</i>	—	3,760 (2000)
	<i>Anas acuta</i>	—	16,500 (1987)
	<i>Anas clypeata</i>	—	6,200 (1994)
	<i>Recurvirostra avosetta</i>	—	2,200 (1974)
	<i>Larus genei</i>	—	200 (1976)
	<i>Sterna caspia</i>	—	595 (2000)
A4iii	Up to 46,000 waterbirds have been recorded at this site.		

Other threatened/endemic wildlife

The mammal *Trichechus senegalensis* (VU) has been recorded.

Conservation issues

Until the early 1960s the lower delta of the Senegal river was an area of extraordinary biodiversity and ecological richness and a large population of nomadic herders and settled farmers and fishermen. However, following the construction of the Diama dam at the river mouth in 1986 and the Mantali dam in Mali in 1990, the delta has dramatically changed. The dams were to supply irrigation water for agriculture to the Senegal river valley as well as creating hydroelectric power and increasing the navigable distance of the river. A large number of problems have, however, ensued; irrigated crops have proved economically unviable, increasing soil salinity is a prevalent problem and the non-agricultural activities associated with the area have suffered. Thus, livestock have had less access to water and

grazing, fish stocks have declined, woodlands have been lost and water-table recharge was hampered. There have also been numerous social and health problems.

The Diama dam stops dry-season inundation of seawater upriver, and embankments were built to create a large freshwater lake to supply water for irrigation. At the time of construction the hydraulic infrastructure needed to preserve the biodiversity of the region was not in place and as a result the area was significantly adversely affected. In 1994, IUCN started a programme to rehabilitate the delta, working in collaboration with the management of Diawling National Park, created in 1991. Using local knowledge of the functioning of the estuary, the IUCN project has resulted in the rapid restoration of the hydrology of the area, with dramatic results. Fish stocks have recovered, pastures were restored, *Sporobolus* grass recolonized and local women have begun earning money from making it into mats. The harvesting of this plant has had to be controlled by the authorities to assure its regeneration. There is fear that too many herders will bring their animals to the delta and that grazing pressure could approach its limits.

In 1997 an entrepreneur employing local fishermen set up an intensive shrimp fishery. The nets used are not the traditional grass meshes but fine-mesh nylon. This allows more shrimp to be caught, is thought to inhibit their migration and may result in over-fishing. The uncontrolled expansion of vegetable gardening poses another risk.

Further reading

Boubouth *et al.* (1999), De Naurois (1969), Hammerlynck *et al.* (1998, 1999), IUCN (1987), Kelleher *et al.* (1995), Messaoud *et al.* (1998), Parc National de Diawling (1996), Taylor (1993).

Kankossa

Admin region Assaba

Coordinates 16°01'N 11°32'W

Area 1,500 ha Altitude c.200 m

MR022

A4iii

Unprotected

Site description

Kankossa is a large permanent wetland situated in the valley of the Karokoro, a seasonal river that flows from just south of Kiffa to meet the Senegal river between Bakel and Kayes. The river is frequently blocked by sand deposits and is morphologically highly dynamic. The surface area of the permanent wetland is 1,500 ha, but the river fills up to 50 km north of Kankossa in years of high rainfall. The vegetation of Kankossa includes a dense *Acacia nilotica* woodland in the centre of the depression with *Acacia seyal*, *Hyphaene thebaica*, *Combretum glutinosum*, *Ziziphus mauritiana* and *Ptilostigma reticulatum* on the banks. *Nymphaea* and *Echinochloa* spp. typify the aquatic vegetation, while the herbaceous layer includes *Aristida mutabilis*, *Dactyloctenium aegyptium* and *Cenchrus biflorus*. The banks of the wetland are lined with vegetable gardens, and livestock find a year-round supply of fodder and water. The catchment receives an average 200–250 mm of rain per year.

Birds

See Box for key species. Typical waterbird species include *Anas querquedula*, *Anas acuta*, *Dendrocygna viduata*, *Dendrocygna bicolor*, *Plectropterus gambensis*, *Plegadis falcinellus* and *Philomachus pugnax*.

Key species

A4iii More than 20,000 waterbirds have been recorded at this site.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

The growth of the town of Kankossa is increasing pressures on the wetland. The expansion of the urban area, agricultural land and gardens means a loss of natural habitat. The *Acacia nilotica* woodland requires careful management to ensure adequate regeneration to replace the old trees.

Further reading

Lamarque (1988), van Wetten (1990).

Tinigart

Admin region Hodh Ech Chargui

Coordinates c.18°25'N 08°10'W

Area Undefined Altitude 300–320 m

MR023

A1, A3 (A02)

Unprotected

Site description

Situated on the Dahr Oualâta escarpment in the far east of the country, Tinigart is an area of cliffs and ravines. There are numerous wells on the plains and permanent springs, fed from water-filled fractures in the rock. Typical plant species include *Hyoscyamus muticus*, *Tamarix* sp., *Acacia raddiana*, *Capparis decidua*, *Leptadenia pyrotechnica*, *Maerua crassifolia*, *Salvadora persica*, *Balanites aegyptiaca* and *Panicum turgidum*. The site is an important pastoral zone, visited by livestock from all over the eastern region.

Birds

See Box and Table 2 for key species. In addition two species of the Sahel biome have been recorded from this site (see Table 2).

Key species

 A1 *Neotis nuba*

A3 (A02) Sahara-Sindian biome: Nine of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

No information.

Further reading

Lamarche (1988).

Wad Initi

Admin region Hodh Ech Chargui

Coordinates c.17°30'N 07°30'W

Area Undefined Altitude 300–320 m

MR024

A1, A3 (A02, A03)

Unprotected

Site description

The site is a large sand-filled wadi near the ancient town of Oualâta. Situated in the Dahr Oualâta escarpment, it is a zone of lowland depressions and ephemeral wetlands on the plains, interspersed with permanent wells. The mountains contain deep permanent rock-pools or gueltas. The vegetation of the area includes *Hyoscyamus muticus*, *Tamarix* sp., *Acacia raddiana*, *Capparis decidua*, *Leptadenia pyrotechnica*, *Maerua crassifolia*, *Salvadora persica*, *Balanites aegyptiaca*, *Panicum turgidum* and *Cenchrus biflorus*.

Birds

See Box and Table 2 for key species.

Key species

 A1 *Neotis nuba*

A3 (A02) Sahara-Sindian biome: Nine of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

A3 (A03) Sahel biome: Nine of the 14 species of this biome that occur in Mauritania have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

No information.

Further reading

Lamarche (1988).

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