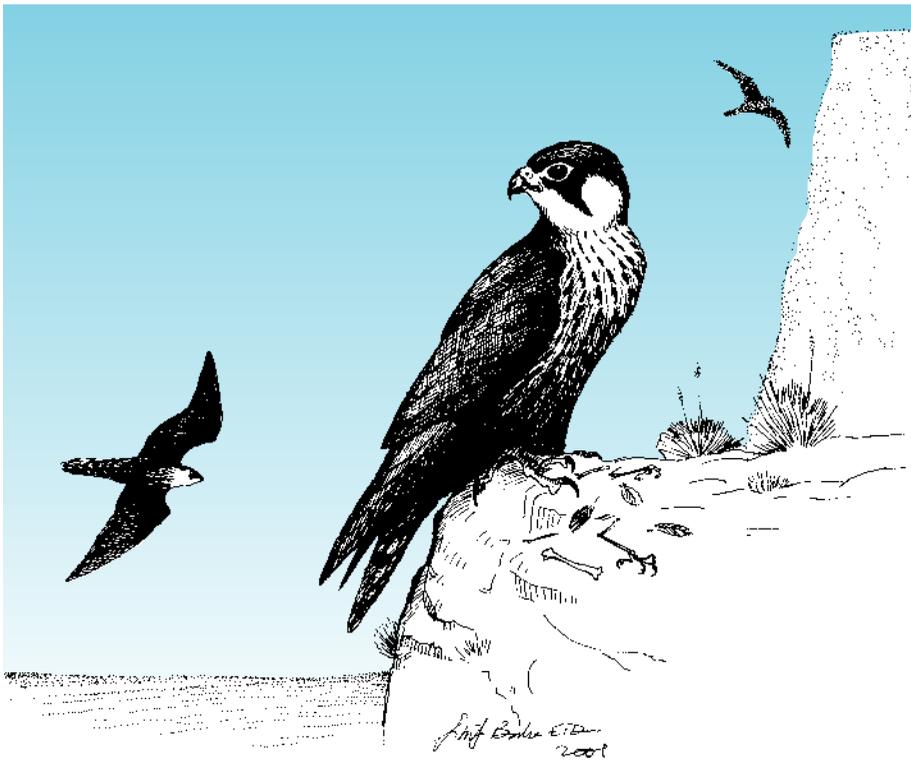


MOROCCO

CHRIS MAGIN (EDITOR)



Eleonora's Falcon
Falco eleonorae.
(ILLUSTRATION: SHERIF BAHA EL DIN)

GENERAL INTRODUCTION

The Kingdom of Morocco, as currently recognized by the United Nations, has an area of 458,730 km² and a population (in 1994) of 26.6 million. In the rest of this chapter, Morocco will be taken to include the Western Sahara, which is administered by the Moroccan government in Rabat. With a total surface area of 710,850 km², the overall human population density of the country is therefore a relatively sparse 37 persons/km². However, far higher densities are reached in the fertile plains of the north and north-west, while population densities are much lower in the east and south. Morocco is bordered by Algeria to the east and Mauritania to the south. The country is divided into 40 administrative regions called provinces. Rabat is the administrative capital and seat of government, while Casablanca is the largest town, principal financial and commercial centre, and main port.

The climate is generally Mediterranean with rainfall concentrated in the cooler months between autumn and spring, except in the extreme south-west, where it can be considered to be truly Saharan. Morocco has been described as a 'cold country under a hot sun' because of the moderating influence exerted on much of the country by the prevailing cool winds from the Atlantic, and temperatures are generally lower than at comparable latitudes in countries further east in Africa. Temperatures are influenced by both latitude and altitude, and vary from below -20°C in the mountains in midwinter to over 45°C in the Sahara at the height of summer. Many of the mountain ranges are snow-capped in winter, to the extent that both the Middle and High Atlas boast small winter ski-resorts. Annual rainfall varies from under 25 mm in the valley of the Drâa to almost 2,000 mm in the Rif mountains.

Geographically, Morocco is extraordinarily diverse, and supports habitats ranging from high-altitude moorland through cork-oak forests to wetlands, deltas, arid steppes and deserts. Located in the extreme north-west of Africa, the country is bordered to the north by the Mediterranean, to the west by the Atlantic, and to the south and east by the Sahara. The interior is divided by four large mountain

ranges. From north to south these are the Rif, which runs east-west along the Mediterranean coast, followed by three roughly parallel ranges running from north-east to south-west, namely the Middle, High and Anti-Atlas. Jbel Toubkal in the High Atlas reaches 4,167 m in altitude, and is the highest point in North Africa.

By virtue of its position opposite Spain on the southern side of the narrow (12 km wide) Straits of Gibraltar, Morocco forms an ecological bridge between Europe and Africa, with fauna and flora showing a mixture of Palearctic and Afrotropical elements. Morocco has relatively high levels of biodiversity for a country of its size, and endemism in most animal and plant groups is also high. Around 3,500–3,750 vascular plant species have been recorded, of which 550–650 are endemic. Twenty of the 93 reptile species are endemic, two of the 11 amphibians and six of the 102 mammals.

As is the case in many Mediterranean countries, the long duration of human occupation has led to a long history of intensive exploitation of natural resources. Morocco has a rapidly expanding human population which, due to the predominantly arid and semi-arid climate of the interior, is chiefly confined to the Mediterranean and Atlantic coastal regions. The high population density in these wetter, more fertile coastal plain and hill areas has resulted in intense pressure for agricultural land and severe deforestation, with consequent environmental degradation and grave implications for the region's biological diversity. Forest clearance for fuelwood and timber has reduced forest cover to a fraction of its former extent, and soil erosion, due to overgrazing and poor agricultural methods, is a major problem.

Morocco can be divided into eight major biogeographical regions:

- Rif: the Rif forms a range of largely impenetrable limestone and sandstone mountains along the northern Mediterranean coast, rising steeply from sea-level to heights of around 2,200 m. The region has many Palearctic affinities.
- Atlantic plains: the fertile and well-watered plains between the Atlantic and the inland mountain ranges are heavily cultivated. Major rivers draining the region include the Sebou, Oum er-Rbia and, further south, the Souss.

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

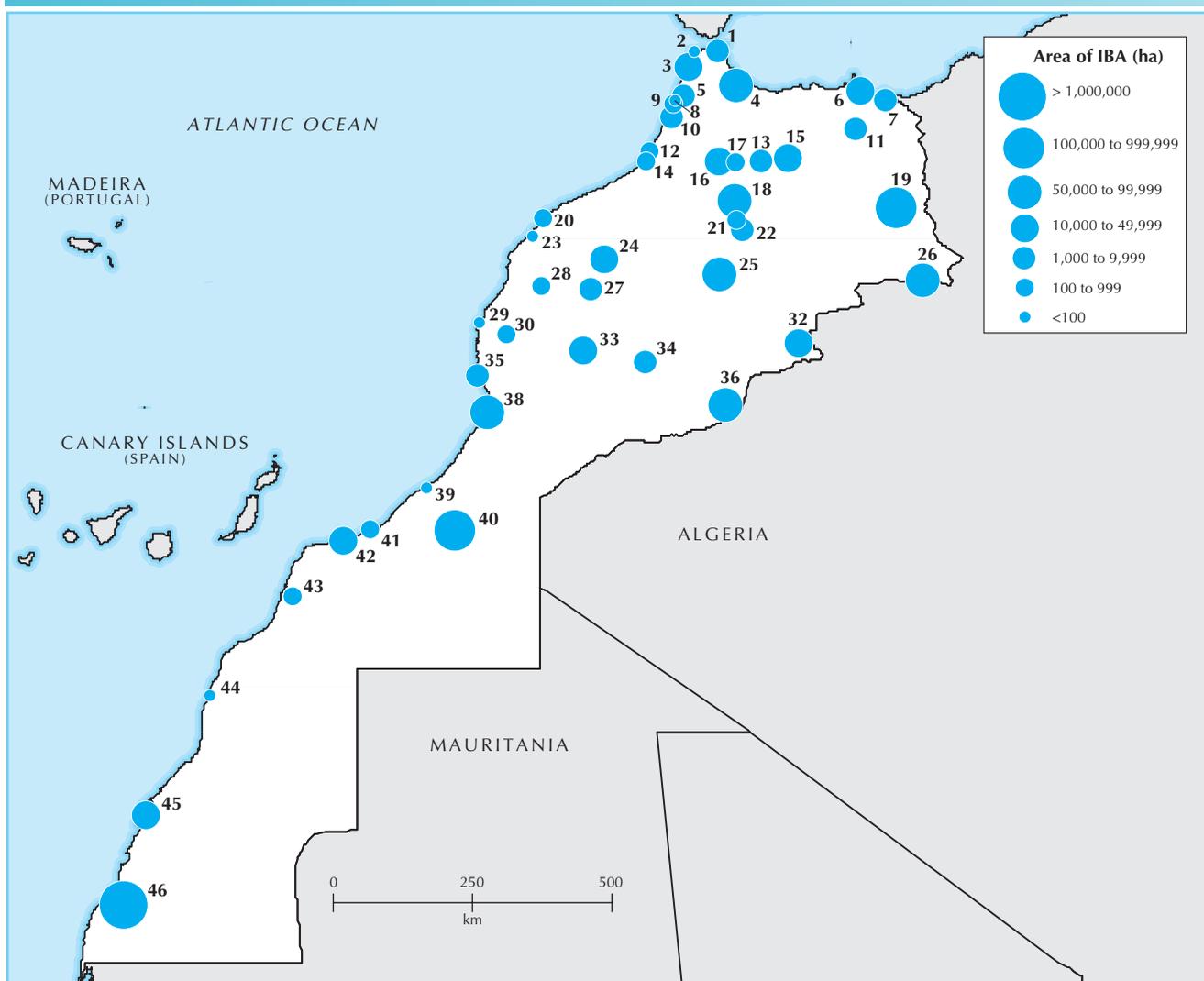


Table 1. Summary of Important Bird Areas in Morocco.

46 IBAs covering 30,338 km²

IBA code	Site name	Administrative region	Criteria (see p. 11; for A3 codes, see Table 2)						
			A1	A3 A01 A02	A4i	A4ii	A4iii	A4iv	
MA001	Jbel Moussa	Tetouan							✓
MA002	Cap Spartel-Perdicaris	Tanger							✓
MA003	Oued Tahadart	Tanger	✓			✓			
MA004	Parc Naturel de Talassemtane	Chefchaouen, Tetouan		✓					
MA005	Marais Larache	Larache	✓			✓			
MA006	Sebkha Bou Areg	Nador	✓			✓			
MA007	Embouchure Oued Moulouya	Nador, Oujda	✓			✓			
MA008	Merja Bargha	Larache				✓			
MA009	Merja Halloufa	Kenitra				✓			
MA010	Merja Zerga	Kenitra	✓			✓		✓	
MA011	Barrage Mohamed V	Nador	✓			✓			
MA012	Canton Forestier de Sidi Bou Ghaba	Kenitra	✓	✓		✓			
MA013	Barrage Idriss Premier	Taounate				✓			
MA014	Falaise Sidi-Moussa	Rabat		✓					
MA015	Parc National de Tazekka	Taza		✓					
MA016	Jbel Zerhoun	Meknès	✓						
MA017	Dwiyate	Fès	✓			✓			
MA018	Parc Naturel d'Ifrane	Ifrane	✓	✓		✓			
MA019	Région Fouchal-Matarka	Figuig, Oujda		✓					
MA020	Région Jorf Lasfar	El Jadida				✓			
MA021	Aguelmane n'Tifounassine	Ifrane				✓			
MA022	Aguelmane de Sidi Ali Ta'nzoult	Khénifra				✓			
MA023	Sidi Moussa-Oualidia	El Jadida	✓			✓			
MA024	Barrage Al Massira	Kelaat Sraghna, Settat	✓			✓		✓	

Table 1 ... continued. Summary of Important Bird Areas in Morocco. 46 IBAs covering 30,338 km²

IBA code	Site name	Administrative region	Criteria (see p. 11; for A3 codes, see Table 2)						
			A1	A3	A4i	A4ii	A4iii	A4iv	
MA025	Parc National du Haut Atlas Oriental	Khénifra, Errachidia		✓					
MA026	Jbel Krouz	Figuig			✓				
MA027	Sahb Al Majnoun	Kelaat Spaghna				✓			
MA028	Sebkha Zima	Safi	✓			✓			
MA029	Archipel d'Essaouira	Essaouira		✓			✓		
MA030	Piste de Tagdilt	Ouarzazate		✓	✓				
MA031	Oued Matil-Ksob	Essaouira	✓			✓			
MA032	Merzouga/Tamezguidat	Errachidia	✓		✓	✓			
MA033	Parc National de Toubkal	Houz, Ouarzazate, Taroudant		✓					
MA034	Barrage Al Mansour Ad-Dhabi	Ouarzazate	✓			✓			
MA035	Tamri and Imsouane	Agadir	✓	✓		✓			
MA036	Tarhazoute	Agadir	✓			✓			
MA037	Oued Mird	Ouarzazate			✓				
MA038	Parc National de Souss-Massa and Aglou	Agadir, Tiznit	✓	✓		✓			
MA039	Plage Blanche-Ras Takoumba	Guelmim	✓			✓			
MA040	Msseyed	Tan Tan	✓	✓	✓	✓			
MA041	Oued Amma Fatma	Laayoune	✓			✓			
MA042	Lagune de Khnifiss	Laayoune	✓			✓	✓		
MA043	Zone Humide de Laayoune	Laayoune				✓			
MA044	Pointe d'Awfist	Boujdour	✓			✓			
MA045	Baie d'Ad Dakhla	Oued Eddahab	✓		✓	✓		✓	
MA046	Parc National de Dakhla	Oued Eddahab			✓	✓			
Total number of IBAs qualifying:			25	13	7	33	1	4	2

- Northern coastal plains: situated to the east of the Rif and running to the Algerian border, these are very similar to the Atlantic plains, but possess a more typically Mediterranean climate, fauna and flora. The major watercourse is the Oued Moulouya.
- Middle Atlas: the rounded summits and plateaus of the Middle Atlas in the north-central region of Morocco are separated from the Rif by the narrow Taza gap, the only low-altitude pass between the Atlantic coast and the eastern half of the country. The Middle Atlas rises to 3,290 m.
- Tafilet: a plateau region to the east and south of the Middle Atlas. Mainly rocky and gravelly plains, but some large sand-dunes or 'ergs' do occur near Erfoud.
- High Atlas: from relatively low beginnings in the coastal foothills between Essaouira and Agadir, the High Atlas mountains rise dramatically to 4,167 m at the summit of Jebel Toubkal. Several high mountain passes traverse the range, notably the Tiz-n-Test and the Tiz-n-Tchekkar.
- Anti-Atlas: by far the lowest of the four mountain ranges, the Anti-Atlas is also the most arid, barren and inhospitable. The High Atlas and Anti-Atlas are mainly drained by seasonal watercourses or oueds. Much of the water from the southern side of the High Atlas and southern side of the Anti-Atlas drains into the Oued Drâa, which only occasionally completes its course to the Atlantic near Tan Tan.
- Sahara: much of the Moroccan Sahara, which lies to the south and east of the High and Anti-Atlas, consists of stony or rocky plateaus called hamada. Sand sheets and dune fields are mainly confined to the far south, near the Mauritanian and Algerian borders.

ORNITHOLOGICAL IMPORTANCE

A total of 433 bird species has been recorded from Morocco (Combridge and Snook 1997), but none is endemic. Twelve globally threatened species occur, of which two are classified as Critically Endangered (CR), nine as Vulnerable (VU) and one as Conservation Dependent (CD). Morocco harbours the last wild breeding colonies in the world of *Geronticus eremita* (CR), a formerly widespread species and, until recently, was a regular wintering site for small numbers of *Numenius tenuirostris* (CR). There are globally significant breeding and wintering populations of *Marmaronetta*

angustirostris (VU) and *Falco naumanni* (VU), and significant wintering populations of *Larus audouinii* (CD). The other Vulnerable species are *Aythya nyroca*, *Oxyura leucocephala*, *Aquila adalberti*, *Aquila clanga*, *Crex crex*, *Otis tarda* and *Acrocephalus paludicola*. Three globally near-threatened (NT) species also occur: *Aegypius monachus*, *Tetrax tetrax* and *Gallinago media*. The extinct *Haematopus meadewaldoi* may also have formerly occurred.

Morocco does not hold any restricted-range species, but elements of two biome-restricted assemblages are present. The Mediterranean North Africa biome (A01) covers roughly the northern half of the country, including all the main mountain ranges, and 16 of the 17 species restricted to this biome are known to be present in Morocco. The North African component of the Sahara-Sindian biome (A02) covers the southern half, and 15 of its 22 characteristic species occur.

Morocco is a bottleneck on a main migration route between Europe and Africa for tens of millions of western Palearctic migrants. Up to 200,000 raptors and 90,000 storks and cranes have been recorded passing across the Straits of Gibraltar at Jbel Moussa in northern Morocco. Most of the coastal wetlands and many of the inland waters are crucial resting and refuelling stops, or overwintering sites, for waterbirds using the 'Atlantic Coastal Flyway' that descends the western seaboard of continental Europe and Africa from Norway to Senegal and beyond.

CONSERVATION INFRASTRUCTURE AND PROTECTED-AREA SYSTEM

The Moroccan government has a firm commitment to the protection of the country's biodiversity, as evinced by the development of the protected-area network. There are three existing National Parks (Souss-Massa, Toubkal and Tazekka), two proposed National Parks (Dakhla and Haut Atlas Oriental), two proposed Natural Parks (Ifrane and Talassemtane) and 146 existing or proposed Natural Reserves. In mid-2000, responsibility for the management of these fell to the Direction de la Chasse, de la Pêche et de la Protection de la Nature within the Direction de la Conservation des Ressources Forestières. The Direction itself was under the responsibility of a Ministère Délégué, chargé des Eaux et Forêts of the Ministère de l'Agriculture, du Développement Rural et de la Pêche Maritime. Morocco also possesses a recently created Ministère de l'Environnement with an Observatoire National de

Table 2. The occurrence of biome-restricted species at Important Bird Areas in Morocco. Sites that meet the A3 criterion are highlighted in **bold**.

A01 – Mediterranean North Africa biome (16 species in Morocco; 13 sites meet the A3 criterion)																												
IBA code:	001	002	004	007	011	012	013	014	015	016	017	018	019	022	023	025	029	030	031	032	033	035	036	038	040	045	046	
<i>Falco eleonorae</i>						✓		✓									✓								✓			
<i>Alectoris barbara</i>	✓	✓	✓		✓	✓			✓	✓	✓	✓	✓	✓					✓		✓			✓	✓	✓		
<i>Caprimulgus ruficollis</i>			✓	✓		✓				✓			✓											✓	✓		✓	
<i>Picus vaillantii</i>			✓	✓					✓			✓		✓								✓						
<i>Ramphocoris clotbey</i>													✓						✓		✓				✓	✓	✓	
<i>Chersophilus duponti</i>													✓															
<i>Eremophila bilopha</i>													✓												✓	✓	✓	
<i>Phoenicurus moussieri</i>	✓		✓		✓		✓		✓	✓				✓	✓	✓				✓		✓	✓	✓	✓	✓	✓	✓
<i>Oenanthe leucura</i>			✓		✓				✓	✓									✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Oenanthe moesta</i>													✓												✓		✓	
<i>Oenanthe hispanica</i>	✓		✓	✓	✓	✓			✓	✓			✓	✓					✓		✓	✓	✓	✓	✓	✓	✓	✓
<i>Sylvia melanocephala</i>	✓		✓	✓	✓	✓			✓	✓	✓	✓	✓	✓						✓		✓	✓	✓	✓	✓	✓	✓
<i>Sylvia cantillans</i>			✓			✓			✓				✓									✓	✓	✓	✓	✓	✓	✓
<i>Sylvia conspicillata</i>				✓									✓	✓								✓	✓	✓	✓	✓	✓	✓
<i>Sylvia deserticola</i>																						✓					?	
<i>Sturnus unicolor</i>			✓			✓			✓	✓	✓	✓		✓	✓					✓				✓	✓	✓	✓	
Number of species recorded:	4	1	9	5	5	7	1	1	8	7	3	9	9	5	2	8	1	7	6	3	9	7	9	13	6	1	6	
A02 – Sahara–Sindian biome (15 species in Morocco; seven sites meet the A3 criterion)																												
IBA code:	004	019	025	026	030	032	035	037	038	040	043	045	046															
<i>Pterocles senegallus</i>				✓	✓	✓			✓	✓		✓	✓															
<i>Pterocles coronatus</i>				✓	✓	✓			✓	✓		✓	✓															
<i>Pterocles lichtensteinii</i>						✓			✓			✓	✓															
<i>Bubo ascalaphus</i>	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓															
<i>Caprimulgus aegyptius</i>				✓		✓			✓			✓	✓															
<i>Ammomanes cincturus</i>		✓		✓	✓	✓			✓			✓	✓															
<i>Ammomanes deserti</i>		✓	✓	✓	✓	✓			✓			✓	✓															
<i>Alaemon alaudipes</i>		✓		✓	✓	✓			✓			✓	✓															
<i>Hirundo obsoleta</i>				✓									✓															
<i>Oenanthe leucopyga</i>				✓		✓			✓			✓	✓															
<i>Oenanthe lugens</i>				✓	✓	✓			✓			✓	✓															
<i>Turdoides fulvus</i>				✓		✓			✓	✓		✓	✓															
<i>Scotocerca inquieta</i>				✓		✓			✓			✓	✓															
<i>Rhodopechys githaginea</i>		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓															
<i>Passer simplex</i>						✓			✓				✓															
Number of species recorded:	1	5	2	13	8	14	2	14	5	11	1	8	12															

l'Environnement du Maroc (ONEM) containing a Cellule de Biodiversité et Désertification.

A comprehensive protected-area system review was completed for the then Administration des Eaux et Forêts et de la Conservation des Sols (AEFCS) by a consortium of French consultancy companies, BCEOM-SECA, in 1995. Management plans for existing and proposed National and Natural Parks were prepared, and propositions made for the creation of new protected areas based on the identification of 168 'Sites d'Intérêt Biologique et Ecologique' (SIBEs). SIBEs were subdivided into continental, wetland (H = zone humide) and coastal (L = littoral) sites, and assigned priorities for protection ranging from 1 to 3 (1 = site to be protected within five years, 2 = within 10 years, 3 = lower priority). Thus a SIBE with the code H63 (2) represents wetland site no. 63, whose protection within 10 years is advised. Where applicable, the SIBE code for sites is given in the 'Conservation issues' section of site accounts.

A plethora of terms are used to describe Morocco's protected areas, but definitions are confused and may change in the future. The original French terms, together with the translations used in this chapter and brief descriptions of the statutes applying (where known) are as follows:

- Amodiation de chasse—Hunting Block or concession in which hunting rights are reserved for members of a leasing body
- Canton forestier—Forest 'District' or Reserve
- Domaine de chasse—a hunting reserve in which hunting is permitted, but controlled
- Domaine de chasse royale—Royal Hunting Reserve, a zone in which hunting is reserved for the king

- Domaine public forestier—state-owned land under the management of AEFCS
- Domaine royal—palace property, owned by the king
- Monument historique—Historical Monument
- Parc National—National Park, in which activities entailing modification of the natural environment are restricted
- Parc Naturel—Natural Park, a proposed future designation
- Réserve Biologique—Biological Reserve
- Réserve Biologique Permanente—Permanent Biological Reserve
- Réserve de chasse—a hunting reserve in which no hunting is permitted
- Réserve Naturelle—Natural Reserve, a proposed future designation.

A fuller description of existing and proposed future legislation is available in BCEOM-SECA (1995a).

INTERNATIONAL MEASURES RELEVANT TO THE CONSERVATION OF SITES

Morocco has ratified the Convention on Biological Diversity, CITES, the Convention to Combat Desertification, the Convention on Climate Change, the Convention on Migratory Species, the World Heritage Convention and the Ramsar Convention. Four sites are listed under the Ramsar Convention: Aguelmane Afennourir, a highland lake in the proposed Parc Naturel d'Ifrane (site MA018 in this inventory); and three coastal sites, Lagune de Khnifiss (MA042), Merja Zerga (MA010) and the Réserve Biologique de

Sidi Bou Ghaba (MA012). Six archaeological sites have been designated World Heritage Sites. In addition, Morocco participates in UNESCO's Man and the Biosphere (MAB) programme, under which two sites have been nominated: a 2.6 million ha Biosphere Reserve, Arganeraie, in the vicinity of Agadir and Essaouira and the 7.2 million ha Oasis du Sud Marocain.

OVERVIEW OF THE INVENTORY

A total of 46 Important Bird Areas (IBAs) is identified in this inventory, covering c.30,338 km², equivalent to 4.3% of the country's land area (Map 1, Table 1). There is a high degree of overlap between IBAs and SIBEs: 42 of the 46 IBAs identified correspond to SIBEs and/or proposed or existing National and Natural Parks. Overall, 31 of the sites are unprotected, five are partially protected and a further 10 benefit from some form of official protection. All major habitat-types and biogeographical regions are represented in the IBA network. The importance of 'wetlands in a dry country' is underscored by the fact that 16 (35%) of Morocco's IBAs are freshwater wetland sites, while a further 10 (22%) are coastal/estuarine wetlands, classified as IBAs on the basis of numbers of migratory waterfowl and wader species held. All of Morocco's resident birds of global conservation concern are well represented in the inventory, with the exception of *Tetrax tetrax* (LR/nt) for which no site has been identified. Migrants such as *Crex crex* (VU), *Acrocephalus paludicola* (VU), *Aquila adalberti* (VU) and *Aquila clanga* (VU) probably pass through many of the sites in small numbers, but have not been specifically identified. Thirteen sites qualify under the A3 criterion for the Mediterranean North Africa biome (A01), between them holding all 16 species that are restricted to this biome and that have been recorded nationally, while seven sites have been selected for the Sahara-Sindian biome (A02), together holding all 15 species (Table 2).

All of the important habitats for birds are covered, including natural and man-made wetlands, estuaries, cork-oak, juniper and cedar forests, steppe, desert and mountain plateaus. Desert sites are under few immediate threats, except for the practically ubiquitous influence of overgrazing, but many sites in the fertile and well-watered lowlands are under intense human pressure, particularly wetlands. Primary threats include conversion of habitat to agricultural land, deforestation, excessive abstraction of water, and pollution from industry and agriculture. Many bird species, such as breeding raptors, sandgrouse, larks and bustards, are widely distributed and only a small proportion of their total population is covered by the sites selected. Effective conservation of these species will therefore depend on implementation of conservation measures for the wider environment, such as regulation of livestock stocking rates on semi-arid rangelands and of forestry and hunting, and predator-control campaigns.

COMMENTS ON THE INVENTORY

- Place names may vary from those used by other authors due to the lack of a universally accepted transliteration from Arabic and Berber into French. Wherever possible, spelling of site names follows that used by the SIBE inventory. The administrative region given is the province.
- The majority of data used in compiling these accounts was collected during the period 1995–1999.
- Due to the relatively small number of ornithologists working in Morocco, some sites have only ever been visited and documented once or twice, and comprehensive data are lacking. Consequently, lists of species recorded are generally incomplete: many sites will be found, for example, to hold more biome species than indicated in Table 2.
- This inventory should not be regarded as final since other important bird areas are likely to be identified following further surveys of the country's biological resources.

ACKNOWLEDGEMENTS

The site accounts were compiled from information commissioned from various authors by BirdLife International as part of its Moroccan IBA programme.

Existing published sources were consulted, and many sites were also visited. Contributors included Prof. Jacques Franchimont, Lahcen Chillasse, El Mostafa Saadaoui, Ahmed El Ghazi and Tarik Mounni of the Groupe Ornithologique du Maroc (GOMAC); Dr Mohamed Dakki and Dr Mohammed-Aziz El Agbani of the Groupe de Recherche Pour les Oiseaux du Maroc (GREPOM) and the Centre d'Étude des Migrations d'Oiseaux (CEMO) and Abdeljebbar Qninba, Abdelaziz Benhoussa, Rhimou El Hammoui and Hassan Jaziri of GREPOM, Mustapha El Hamzaoui and Mohammed Maghnoij of the Centre National de Recherche Forestière (CNRF); Mohammed Ribí, Allal Daali and Said Hajib of the Direction de la Conservation des Ressources Forestières (DRCF); Mohammed Ouahid of the Ministère de l'Intérieur; Chris Bowden of the Royal Society for the Protection of Birds (RSPB) and Fabrice Cuzin. Emmanuel Rousseau and Prof. Michel Thévenot (Centre Interdisciplinaire d'Études Littorales) provided an ornithological bibliography for Morocco. Waterfowl counts are based mostly on data collected for the Wetlands International annual series of January counts, kindly provided by Michael Oneka and Cecilia Reyes. Additional data, field observations and comments were provided by Dr Michel Saint-Jalme of the Emirates Centre for Wildlife Propagation (ECWP), Prof. Michel Thévenot (Ecole Pratique des Hautes Études), Dr Pierre-Christian Beaubrun, Andy Green (Estación Biológica de Doñana), Dr Chris Magin (BirdLife International) and Martin Jacoby.

The Moroccan IBA programme was set in motion by Dr Dieter Hoffmann and Zine Laâbidin Arhzaf of BirdLife International and Professor Abdelhamid Belemlih of SPANA-Morocco with the approval of the Ministère Chargé des Eaux et Forêts, formerly known as the Administration des Eaux et Forêts et de la Conservation des Sols (AEFCS). Initial identification of candidate IBA sites was undertaken at a workshop held in Morocco in September 1995, with the participation of CEMO, CNRF, DRCF, GOMAC, GREPOM, Ministère de l'Environnement and SPANA-Morocco, facilitated by Dr Lincoln Fishpool of BirdLife International. Funding for the IBA programme was provided by Vogelbescherming Nederland via the auspices of Johanna Winkelmann, the RSPB and BirdLife International. Dr Gary Allport, Martin Phillips and Trish Wilson of BirdLife International provided logistical and administrative support.

GLOSSARY

- AEFCS** Administration des Eaux et Forêts et de la Conservation des Sols.
aguelmane mountain lake.
arrêté viziriel a type of legal decree/law enactment.
barkhan a wind-formed desert sand-dune, often crescent-shaped and highly mobile.
bour rain-fed agricultural system.
daya/dayet lake or pond.
doline bowl-shaped depression in limestone country.
douar village administrative unit.
erg large sand-dune.
EU European Union.
graras/grarats small temporary ponds, common on the coastal plains.
gueltat/guelta small pool in mountain gully.
hamada stony or rocky desert plateau.
jbel mountain.
kasbah fortified town/castle.
Macaronesia biogeographical region consisting of the countries of north-western Africa and south-west Europe including the islands of the Azores, Canaries, Cape Verde and Madeira (often used in the expression 'Macaronesian endemic').
marabout shrine.
matorrall Spanish term for dry heathland vegetation.
merja marsh.
mousssem pilgrimage.
oued wadi (see below).
reg stone or gravel desert plain.
RSPB Royal Society for the Protection of Birds.
sansouire basin.
schorre salt-tolerant coastal or saltmarsh vegetation.
sebkha saltpan/saltflat.
SIBE Site d'Intérêt Biologique et Ecologique.
Sidi Moslem saint.
slikke large mudflat.
SPANAs Society for the Protection of Animals Abroad.
système d'agoudal traditional system of pasture rotation.
wadi watercourse, in arid regions often dry for most or part of the year.

SITE ACCOUNTS

Jbel Moussa

Admin region Tetouan
Coordinates 35°54'N 05°25'W
Area c.4,000 ha Altitude 0–841 m

MA001

A4iv
Unprotected

Site description

Jbel Moussa is the southern of the two Pillars of Hercules, situated opposite the Rock of Gibraltar on the African side of the Straits of Gibraltar, at the narrow 15-km-wide western entrance to the Mediterranean. A karstic limestone massif, rising steeply from sea-level to 841 m, the site covers some 4,000 ha and includes the small island of Leila, several rocky headlands and bays and the sandy beach of Ras Ciress. The terrestrial vegetation consists of *Pinus* and *Quercus* woodland. Annual rainfall averages 1,000 mm. Human activities include fishing, agriculture and tourism.

Birds

See Box for key species. The site's principal importance is as a migration bottleneck. Jbel Moussa provides uplifting air currents that are particularly sought out by migrating raptors and soaring species. Huge numbers of European migrants have been recorded passing through, including (per season) more than 90,000 *Ciconia ciconia* and *C. nigra*, up to 150,000 *Pernis apivorus*, 50,000 *Milvus migrans* and several thousand *Hieraaetus pennatus*, *Circaetus gallicus* and *Neophron percnopterus*. One *Aquila adalberti* was seen passing through in September 1993, and the species is undoubtedly a regular migrant in small numbers. Many migrating passerines and waders also transit the site, including *Larus audouinii*, which is a regular migrant along the coast between the Mediterranean and the Atlantic.

Over 100 species have been recorded in total, of which 50 are known to breed, including four species of the Mediterranean North Africa biome (see Table 2). A colony of *Larus cachinnans* nests on the island of Leila.

Key species

A4iv More than 90,000 storks and 200,000 raptors have been recorded passing through the site.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

The site is a priority 1 SIBE (No. L9). The offshore nesting colony of *Larus cachinnans* is threatened by egg-collecting and the presence of free-ranging goats which are destroying the vegetation. Overall, the site is threatened by unregulated camping, scuba-diving and the tipping of rubbish at Ras Léona. It is recommended that conservation measures, including an integrated management plan incorporating ecotourism and a migratory bird observatory, be developed.

Further reading

BCEOM-SECA (1995c), Franchimont and Moumni (1996).

Cap Spartel–Percicaris

Admin region Tanger
Coordinates 35°47'N 05°52'W
Area 70 ha Altitude 0–320 m

MA002

A4iv
Forest Reserve

Site description

The site is located on the outskirts of the town of Tanger (Tangiers) at the western extremity of the southern side of the Straits of Gibraltar. It consists of the small hill of Jbel Kebir (320 m), partly covered by the Forêt de Percicaris and terminating at its western end in the rocky headland of Cap Spartel, which overlooks the Atlantic Ocean. The forest is predominantly composed of *Quercus faginea* with some *Q. suber* and other indigenous species, mixed with poorly-maintained plantations of exotics such as *Eucalyptus globulus*, *Pinus radiata*, *Cupressus macrocarpa* and *Acacia* spp. Forest-cover is highest on the northern slopes between 80 and 240 m in altitude: Cap Spartel itself is

mainly covered with 'matorral' or Spanish maquis-type heathland vegetation. The climate is very humid, due to the site's exposure to the Atlantic, with 900–1,200 mm annual precipitation.

Birds

See Box for key species. The site is of major international importance as a migration bottleneck between Europe and Africa, since it is the first wooded zone encountered by birds crossing the western end of the Straits of Gibraltar. It therefore provides both resting places and thermal updrafts for thousands of soaring migrants. The most noteworthy non-raptor migratory species include *Ciconia ciconia* (30,000–50,000), *Ciconia nigra* (200–400), *Merops apiaster* (40,000–50,000), *Hirundo rustica* (75,000–100,000), and *Apus apus* (400,000–800,000). Amongst the raptors, the most notable are *Pernis apivorus* (60,000–120,000), *Milvus migrans* (30,000–70,000), *Hieraaetus pennatus* (10,000–18,000), *Circaetus gallicus* (5,000–10,000), *Neophron percnopterus* (3,000–5,500), *Gyps fulvus* (700–1,000), *Buteo buteo* (2,000–5,000) and *Circus pygargus* (800–2,000). Many migrating passerines and waders also pass through the site, and seabirds such as *Larus audouinii* pass through on passage between the Mediterranean and the Atlantic. Around 60 species are known to nest, including *Alectoris barbara*, restricted to the Mediterranean North Africa biome (Table 2).

Key species

A4iv Up to 50,000 storks and at least 200,000 raptors, in particular *Pernis apivorus* and *Milvus migrans*, have been recorded passing through the site.

Other threatened/endemic wildlife

The tortoise *Testudo graeca* (VU) occurs.

Conservation issues

The site is classified as a Domaine Public Forestier, and is a priority 3 SIBE (No. L10). Although on the outskirts of the town of Tanger, human impacts on the site are minimal because the Domaine is completely enclosed by a wire-mesh fence.

Further reading

BCEOM-SECA (1995c), Bernis (1980), Finlayson (1992), Pineau and Giraud-Audine (1979).

Oued Tahadart

Admin region Tanger
Coordinates 35°34'N 06°00'W
Area c.14,000 ha Altitude 0–50 m

MA003

A1, A4i
Unprotected

Site description

The site consists of the lower reaches of the Oued M'harhar and Oued Al Hachef, which join to form the 3-km-long estuarine river of the Oued Tahadart, the surrounding land and a sandy stretch of the coast between Tanger (Tangiers) and Asilah. Habitats include marshy basins, coastal mudflats, many small freshwater and brackish merjas and dayas, areas of rough pasture and some patches of cork-oak woodland.

Birds

See Box for key species. The site harbours one of the few populations of *Otis tarda* in Morocco—the only country in North Africa where this species occurs. Precise data on population size are not available, but 35 individuals were seen at Tahadart and 55 in Al Hachef–Charkane during surveys in 1998, and evidence of breeding was observed (courtship displays, nests). Thousands of migrant waders, gulls and waterfowl pass through Oued Tahadart, particularly in winters with heavy rainfall when much of the site is inundated. Up to 600 *Grus grus* and hundreds of *Phoenicopterus ruber* and *Platalea leucorodia* have been recorded, but none of these species is known to have exceeded IBA threshold criteria. *Numenius tenuirostris* formerly occurred as a wintering visitor.

Key species

A1	<i>Otis tarda</i>		
A4i	<i>Charadrius alexandrinus</i>	Breeding (pairs)	Non-breeding
		—	1,020

■ Other threatened/endemic wildlife

None known to BirdLife International.

■ Conservation issues

The site is currently unprotected, but is a priority 2 SIBE (No. L11). Land-ownership is mainly public, but private holdings are present around the periphery. Human activities include cultivation, pastoralism, fishing and hunting. A major conservation threat is the effects of dykes built to support roads, which have altered the drainage system of the area—for example isolating the merja of Wlad Khallouf from the rest of the estuarine system. Powerlines traversing the area and a radio-station (Voice of America) located within it, consisting of many vertical antennae and supporting wire struts, pose a threat to the population of *Otis tarda*: many are reported to have died through collision with wires and powerlines. Recommended conservation measures include the creation and implementation of a management plan for the area, establishment of no-hunting zones to protect *Otis tarda* and fixing of visible deterrents such as spheres to powerlines and cables.

■ Further reading

BCEOM-SECA (1995c), Hellmich *et al.* (1999).

Parc Naturel de Talassemtane

Admin region Chefchaouen, Tetouan

Coordinates 35°15'N 05°07'W

Area 60,000 ha Altitude 20–2,159 m

MA004

A3 (A01)

Unprotected

■ Site description

Located in the Rif mountain range in northern Morocco, a few kilometres east of the town of Chefchaouen, 75% of this 60,000 ha proposed Natural Park lies in rugged terrain, on slopes with a gradient of more than 20%. The site ascends from near sea-level (20 m where the northern boundary crosses the Oued Laou near its estuary) to the summits of Jbels Taloussine (2,005 m), Tissouka (2,122 m) and Lakraa (2,159 m)—an altitudinal range of more than 2,000 metres. The limestone massif of these peaks is mainly forested, the principal woody species being *Quercus rotundifolia*, *Q. faginea*, *Q. coccifera*, *Q. suber*, *Abies maroccana*, *Pinus pinaster*, *P. halepensis*, *P. clusiana*, *Olea europea*, and *Tetraclinis articulata*. Other species include *Juniperus oxycedrus* and *J. phoenicea*. The non-woody flora is also extremely rich, with a high level of endemism, and has been the object of numerous studies.

■ Birds

See Box and Table 2 for key species. A total of 113 species have been recorded, many of them raptors. *Falco naumanni* may nest in small numbers. All nine species of the Mediterranean North Africa biome (A01) that occur at the site also breed there, although two, *Caprimulgus ruficollis* and *Oenanthe leucura*, are considered rare or irregular. A species of the Sahara–Sindian biome (A02) also breeds (see Table 2).

Key species

A3 (A01) Mediterranean North Africa biome: Nine of the 16 species of this biome that occur in Morocco have been recorded at this site; see Table 2.

■ Other threatened/endemic wildlife

The primate *Macaca sylvanus* (VU) and the tortoise *Testudo graeca* (VU) are present, as is one Moroccan endemic reptile *Chalcides polylepis*.

■ Conservation issues

The Parc Naturel de Talassemtane has been proposed since 1969, but has not yet been gazetted. Several controlled hunting zones lay within its limits in 1996—it is recommended that these should be rescinded without delay. The proposed park legislation will prohibit all environmentally detrimental activities, including the cutting of trees, hunting and fishing. However, human activities currently include traditional agriculture and extensive livestock-rearing of cattle and goats, and the site is consequently suffering from overgrazing and the clearance of land on steep slopes—often by fire—in order to permit cultivation of cereal crops. Both these practices are contributing heavily to soil erosion and degradation of the forest. The avifauna is also threatened by illegal hunting and destruction of nests by shepherds. Ecotourism, currently undeveloped, could be an income-generating

activity for the park since the nearby town of Chefchaouen is a major tourist destination throughout the year. A management plan has been developed under the auspices of AEFCS. The conservation priority is for the park to be gazetted and this plan put into operation.

■ Further reading

BCEOM-SECA (1995j, k).

Marais Larache

Admin region Larache

Coordinates 35°10'N 06°03'W

Area c.3,600 ha

Altitude 0–10 m

MA005

A1, A4i

Historical Monument,
Hunting Reserve, Unprotected

■ Site description

Marais Larache is situated on the outskirts of the Atlantic coastal town of Larache. It extends 15 km inland, as the crow flies, from the mouth of the Oued Loukkos, including the estuary and associated salt pans and various freshwater marshes along its course. The two principal marshes are Bedaoua Sejra, on the right bank of the Oued Loukkos and Ain Chouk-Boucharène on the left bank. The whole site comprises part of the Plaine de Ksar El Kbir and is traversed by the Larache–Tanger (Tangiers) road. The marshes are one of the most important wetlands in the country, with a luxuriant and diverse assemblage of aquatic and semi-aquatic vegetation, including *Typha*, *Juncus*, *Scirpus* and *Phragmites* spp. and fringing stands of *Tamarix* and *Salix* spp.

■ Birds

See Box for key species. This wetland site is one of the 5–10 most important wintering sites for Palearctic migrants in Morocco, situated as it is on the Atlantic coastal flyway. More than 4,000 duck regularly winter, including up to 100 *Marmaronetta angustirostris*. *Numenius tenuirostris* was formerly recorded, while *Larus audouinii* regularly occurs in small numbers. Over 50 species breed, including *Fulica cristata*. The Marais Larache is the only known Moroccan breeding site for small numbers of *Aythya nyroca*, and the most important Moroccan site for *Porphyrio porphyrio* (>600 wintering); *Asio capensis* also breeds.

Key species

	Breeding (pairs)	Non-breeding
A1 <i>Marmaronetta angustirostris</i>		
A4i <i>Platalea leucorodia</i>	—	160+
<i>Phoenicopeterus ruber</i>	—	800+
<i>Marmaronetta angustirostris</i>	—	100
<i>Fulica cristata</i>	—	3,000
<i>Recurvirostra avosetta</i>	—	1,000+

■ Other threatened/endemic wildlife

Six endemic lizards—*Acanthodactylus lineomaculatus*, *Chalcides colosii*, *C. mionecton*, *C. pseudostratus*, *C. polylepis* and *Blanus tingitanus*—occur, as does the endemic Moroccan amphibian *Pelobates varaldii*.

■ Conservation issues

The site is mainly public land, with some private holdings. The estuary and the Roman ruins of Lixus are protected as a 'Monument Historique' and Hunting Reserve: the remainder is unprotected. The site was classed as a priority 1 SIBE (No. L12). Human activities include extensive and intensive agriculture (cereal and legumes, tomatoes and sugar-cane), livestock-rearing, hunting, salt production, reed-cutting and tourism.

There are multiple threats, including a cannery on the right bank of the estuary, which discharges large volumes of effluent into the salt pans; overgrazing of the upper marshes; illegal hunting and collecting of birds' eggs; pollution from agricultural pesticides and fertilizers contained in farmland run-off; a proposed new irrigation project on the lower Oued Loukkos; and a proposed drainage scheme to convert the marshland to agricultural land. The area merits gazettement, and perhaps designation as a Ramsar Site, followed by the application of an integrated management plan. Measures to protect bird nesting sites and to control hunting and water-pollution are urgently required.

■ Further reading

BCEOM-SECA (1995c), El Agbani (1997).

Sebkha Bou Areg

Admin region Nador

Coordinates 35°10'N 02°51'W

Area 18,000 ha Altitude 0–105 m

MA006

A1, A4i

Unprotected

Site description

The site is a long narrow lagoon on the Mediterranean coast in north-east Morocco, lying between the Cap des Trois Fourches and the Cap de l'Eau (Ras el Ma). Sebkha Bou Areg (also known as Ma Chica) is separated from the open sea by a 24-km-long sandbar, broken near its middle by a narrow channel. The site is bordered on the north-west by the port of Beni Enzar, to the west by the town of Nador, and to the south by the village of Kariat Arkmane. Although covering almost 18,000 ha, the lagoon is shallow, nowhere more than 7 m deep, and in some areas salt is precipitated through evaporation of seawater. The limits of the IBA encompass the lagoon, its sandbar, and the fringing coast, including a rocky conical hill on a promontory which rises to 105 m, but most of the site lies below 10 m. Annual rainfall is 400 mm. The lagoon vegetation consists of *Zostera marina* and *Posidonia caulinii*: on shore, *Salicornia* dominates and there is a well-developed reedbed near Kariat Arkmane.

Birds

See Box for key species. A total of 160 species has been recorded at Sebkha Bou Areg, many of them breeding. *Phoenicopterus ruber* and *Glareola pratincola* are both former breeders. The site is well known for its large numbers of waders and other waterbirds. In addition to the six species which regularly exceed IBA threshold levels, *Glareola pratincola* may do so exceptionally. *Numenius tenuirostris* formerly occurred, but the last confirmed sightings were of three overwintering birds in 1990 and 1991.

Key species

A1	<i>Larus audouinii</i>		
A4i		Breeding (pairs)	Non-breeding
	<i>Bubulcus ibis</i>	—	5,000
	<i>Phoenicopterus ruber</i>	—	800–990
	<i>Charadrius alexandrinus</i>	—	991
	<i>Larus audouinii</i>	—	1,257
	<i>Larus cachinnans</i>	5,457	—
	<i>Sterna bengalensis</i>	—	74

Other threatened/endemic wildlife

Two nationally rare skinks, *Chalcides ghiari* and *C. mauritanicus*, are present.

Conservation issues

The site is a priority 2 SIBE (No. L2), but currently has no legal protection. The main human activities are fishing, fish-farming and salt harvesting. The site is threatened by industrial and tourist development; overfishing of the lagoonal resources including molluscs (particularly *Pinna nobilis*); and reclamation of areas of the lagoon for agriculture and pollution. Breeding species are increasingly threatened by human disturbance including shooting, egg-collecting and destruction of nests of ground-nesting species such as terns and gulls.

Further reading

BCEOM-SECA (1995c).

Embouchure Oued Moulouya

Admin region Nador, Oujda

Coordinates 35°06'N 02°22'W

Area c.2,700 ha Altitude 0–60 m

MA007

A1, A4i

Unprotected

Site description

The Oued Moulouya is the largest river to the east of the Middle Atlas and flows 600 km north from Midelt to the Mediterranean. The estuary lies 20 km north of the town of Berkane, only 12 km west of the Algerian border. The site has three components, together comprising 2,700 ha: the Chararba marsh, a freshwater wetland ringed by almost impenetrable dense vegetation; a sandy beach backed by dunes and, in places, a 20-m-high cliff; and the lower 25 km of the course of the

Oued Moulouya itself. The luxuriant riparian vegetation consists of *Tamarix* sp. on the banks and *Phragmites communis*, *Scirpus maritimus*, *Juncus* sp. and *Salicornia* sp. There are also small plantations of *Acacia* and *Eucalyptus* spp. Annual rainfall is 340 mm.

Birds

See Box for key species. An important breeding colony of *Larus audouinii*, numbering 2,700 breeding pairs in 1997, lies just 5 km offshore from the mouth of the estuary on the Islas Chafarinas (IBA ES220), which belong to Spain. The estuary of the Oued Moulouya is thus an important roosting and resting site for this species. *Marmaronetta angustirostris* breeds in small numbers, but is declining in importance as a winter visitor—250 individuals seen in September 1979 and only 38 in April 1996 are indicative. *Numenius tenuirostris* was last recorded in 1958. Around 180 species have been recorded from the site, including five species of the Mediterranean North Africa biome (see Table 2).

Key species

A1	<i>Marmaronetta angustirostris</i>	<i>Larus audouinii</i>	
A4i		Breeding (pairs)	Non-breeding
	<i>Marmaronetta angustirostris</i>	—	38
	<i>Larus audouinii</i>	—	1,200

Other threatened/endemic wildlife

Two restricted-range lizards, *Chalcides mauritanicus* and *C. parallelus*, have been recorded.

Conservation issues

The principal economic activities are fishing, hunting, agriculture and coastal tourism. Although it currently has no protection, the site has been recognized as a priority 1 SIBE (No. L1). It is threatened by the development of a fish-farm, uncontrolled tourist development along the beach, and hunting and poaching by the local population (particularly of ducks and other waterfowl). The cutting of reedbeds by locals also needs to be regulated since it is believed to be depriving *Marmaronetta angustirostris* and other species of suitable breeding habitat.

Further reading

BCEOM-SECA (1995c), Brosset (1959).

Merja Bargha

Admin region Larache

Coordinates 35°02'N 06°13'W

Area 25 ha Altitude 0–10 m

MA008

A4i

Hunting Block

Site description

Merja Bargha is a shallow (1.5 m) freshwater pond situated in an interdunal depression 15 km north-east of the Atlantic coastal resort of Moulay Bou Selham. The pond itself is 600 m long and 400 m wide, and covers approximately 10 ha. The boundaries of the IBA encompass some of the surrounding vegetation, giving the site a total area of 25 ha. The pond is fed mainly by several seepage springs at its southern end and by run-off from the surrounding irrigated fields. In addition, a formerly dry spring, Sidi Slimane, at the north-east of the site, has recently become active again and its outflow is increasing from year to year. The bordering vegetation consists principally of *Typha*, *Juncus* and *Phragmites* spp. whilst *Nymphaea alba* has recently colonized the shallow water areas. Around the pond is an expanse of *Cynodon* and *Carex* spp. and near the southern end there are plantations of *Eucalyptus*, *Populus* and *Acacia* spp. The surrounding land is intensively cultivated by the inhabitants of the neighbouring village of Bargha, who grow sugar-cane, ground-nuts and other crops. Livestock is also grazed around the pond.

Birds

See Box for key species. About 60 species have been recorded at Merja Bargha, of which 30 occur regularly. Approximately 2,500–5,500 coots (*Fulica atra* and *F. cristata*) and 1,000 duck regularly overwinter, among them small numbers of two species of global conservation concern, *Marmaronetta angustirostris* and *Aythya nyroca*. The former breeds, as does *F. cristata*. *Oxyura leucocephala* was recorded until 1997. The site is also well-known as a location for *Porphyrio porphyrio*.

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Tachybaptus ruficollis</i>	—	1,000+
<i>Fulica cristata</i>	50	400

Other threatened/endemic wildlife

Pelobates varaldii, an endemic Moroccan amphibian, is believed to breed at the site.

Conservation issues

Merja Bargha is public land, currently used as a waterfowl Hunting Block or 'amodiation de chasse de gibier d'eau'. It is classed as a priority 2 SIBE (No. L14). The site is threatened by poaching, the cutting of vegetation around its borders, pollution and over-exploitation for irrigation purposes. Since 1992, the invasive North American duck *Oxyura jamaicensis* has become established at the site and nearby Merja Halloufa, and threatens to hybridize with *Oxyura leucocephala*. Necessary conservation measures include an integrated management plan involving environmental education amongst the surrounding population, the development of ecotourism to provide economic incentives for conservation (the site is close to Merja Zerga, site MA010, and could benefit from tourists attracted to its larger neighbour), the imposition of a hunting ban, eradication of *Oxyura jamaicensis* and the protection of the vegetation.

Further reading

BCEOM-SECA (1995c), Green and El Hamzaoui (1998).

Merja Halloufa		MA009
Admin region	Kenitra	
Coordinates	34°58'N 06°15'W	A4i
Area	300 ha	Hunting Block
Altitude	0–10 m	

Site description

The site is a coastal marsh lying in a depression separated from the Atlantic by a row of dunes, but opening to the sea via a man-made channel equipped with a sluice gate. The wetland itself covers approximately 50 ha, but the IBA limits (which correspond to those of the SIBE) include some of the surrounding area and encompass 300 ha in total. Merja Halloufa is located only eight kilometres north-east of Merja Zerga (site MA010). It is fed by the Oued Souier, the underlying water-table, and by run-off from irrigated fields. The water-level is regulated artificially. The merja is surrounded by many villages and the neighbouring land is intensively cultivated for wheat, sugarcane, strawberries under glass, and other horticultural produce. There are no trees and, apart from some fringing *Juncus* rushes, aquatic vegetation is sparse. The lake is shallow and its bed is practically flat, so that during summer the retreating water exposes large areas of 'prairie' which are used for grazing.

Birds

See Box for key species. Situated on the Atlantic coastal flyway, this site is important for its migratory winter visitors. It harbours an average of 1,000–4,000 ducks and up to 10,000 coots, as well as thousands of gulls (*Larus fuscus* and *L. ridibundus*). Merja Halloufa is also noteworthy for its wintering population of *Netta rufina*: the largest number ever observed in Morocco (300 birds) was recorded here.

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Fulica cristata</i>	50+	—

Other threatened/endemic wildlife

Pelobates varaldii, an endemic Moroccan amphibian, is present.

Conservation issues

Merja Halloufa itself is public land, currently used as a waterfowl hunting block or 'amodiation de chasse touristique', but the surrounding agricultural land is privately owned. The site was classed as a priority 2 SIBE (No. L15). It is threatened by pollution from pesticides and fertilizers in farmland run-off, over-exploitation of the water-table, and the gradual extension of cultivation. Over-hunting

is also a problem. Recommended conservation measures include banning hunting from at least part of the site, restricting the expansion of cultivation by clearly delimiting the public land with permanent markers, encouragement of aquaculture of eels, the development of ecotourism, particularly birdwatching, and a public-awareness campaign about the rational use of pesticide.

Further reading

BCEOM-SECA (1995c).

Merja Zerga		MA010
Admin region	Kenitra	
Coordinates	34°51'N 06°16'W	A1, A4i, A4iii
Area	c.7,000 ha	Permanent Biological Reserve,
Altitude	0–30 m	Ramsar Site

Site description

Merja Zerga is a tidal lagoon located 70 km north of Kenitra on the Atlantic coast. The outlet to the ocean lies at the seaside resort and fishing village of Moulay Bou Selham: hence the site's alternative name of Lagune de Moulay Bou Selham. In addition to its tidal inflow, the lagoon receives fresh water from the Oued Drader and the underlying water-table, which is very close to the surface here. The lagoon itself covers 4,500 ha, of which 30% is open water, and has an average depth of 1.5 m. Large mudbanks are exposed at low tide, providing extensive feeding areas for waders and waterfowl. Around the lagoon and included within the limits of the IBA are areas of rough pasture and marshland, and the Dayet Roureg, a freshwater pond. Vegetation consists mainly of salt-tolerant plants and shrubs such as *Spartina* sp., *Sarcocornia perennis* and *Juncus rigidus*. The annual rainfall of 600–700 mm, coupled with the low-lying nature of most of the site, result in the inundation in winter of large areas of land surrounding the lagoon proper.

Birds

See Box for key species. Merja Zerga is internationally renowned as a passage and wintering site for Palearctic migrants, and is without doubt the most important wetland site in Morocco. In total, over 100 species of bird regularly use Merja Zerga. An average of 15,000–30,000 ducks of 11 different species overwinter, as do approximately the same number of mixed *Fulica atra* and *F. cristata*. The lagoon also regularly holds 50,000–100,000 waders (19 regular species) and 1,000–2,000 *Phoenicopterus ruber*. *Numenius tenuirostris* was last recorded in 1995. There are also many resident breeding species including *Asio capensis*.

Key species			
A1	<i>Marmaronetta angustirostris</i>	<i>Numenius tenuirostris</i>	
A4i		Breeding (pairs)	Non-breeding
	<i>Phoenicopterus ruber</i>	—	1,080
	<i>Tadorna ferruginea</i>	—	250
	<i>Tadorna tadorna</i>	—	4,700
	<i>Anas penelope</i>	—	26,000
	<i>Anas strepera</i>	—	1,350
	<i>Anas clypeata</i>	—	10,960
	<i>Marmaronetta angustirostris</i>	—	30+
	<i>Fulica cristata</i>	—	67
	<i>Fulica atra</i>	—	45,460
	<i>Recurvirostra avosetta</i>	—	6,945
	<i>Pluvialis squatarola</i>	—	5,260
A4iii	More than 20,000 waterbirds occur regularly at this site.		

Other threatened/endemic wildlife

Three endemic Moroccan lizards occur: *Acanthodactylus lineomaculatus*, *Chalcides mionecton* and *C. pseudostrisatus*.

Conservation issues

The lagoon of Merja Zerga was classified as a Permanent Biological Reserve in 1978, and nominated as a Ramsar Site in 1980. It is a priority 1 SIBE (No. L16). Publicly owned, the site is managed by several government agencies: Ministère de l'Agriculture, des Pêches Maritimes, des Habous and de l'Intérieur. A hunting concession is located on the boundaries of the IBA at Merja Kahla. Human activities include fishing, harvesting of shellfish, livestock-rearing, hunting and tourism (including birdwatching). Threats include illegal poaching and

egg-collecting, over-fishing and overgrazing, excessive exploitation of groundwater for use in irrigated cultivation projects around the lagoon's shores, pollution from pesticide and fertilizer run-off from surrounding agricultural land, increasing levels of tourism, and disturbance from the newly constructed motorway on the eastern bank of the lagoon. The area urgently requires the implementation of a coordinated management plan.

Further reading

BCEOM-SECA (1995c), El Agbani (1997), Zwarts (1972).

Barrage Mohamed V

Admin region Nador

Coordinates 34°41'N 02°57'W

Area c.6,000 ha Altitude 195–385 m

MA011

A1, A4i

Unprotected

Site description

The site is a reservoir created in 1967 by the completion of the Mohamed V dam on the Oued Moulouya in the north-east of the country. Up to 60 m deep, the reservoir is one of the largest freshwater wetlands in Morocco. The site boundaries include the lake and the surrounding hills, which rise to 385 m above sea-level from a water-level at 195 m. Average annual precipitation is 400 mm. The terrestrial vegetation includes steppes of *Artemisia inculata* and wooded stands of *Tamarix*, *Salix* and *Eucalyptus*.

Birds

See Box for key species. The reservoir is often host to nearly 100 *Marmaronetta angustirostris* and the species appears to both breed and overwinter. Another waterfowl species, *Tadorna ferruginea*, also breeds (197 adults and young seen on 21 July 1996). A total of almost 50 species are known to breed, many of them waterfowl, 40 overwinter and around 20 have been recorded on passage, including *Falco naumanni* and *Aythya nyroca*. Up to 438 *Phoenicopiterus ruber*, 480 *Grus grus* and 893 *Aythya ferina* have been seen. In addition, five species of the Mediterranean North Africa biome occur (see Table 2).

Key species

A1	<i>Marmaronetta angustirostris</i>		
A4i		Breeding (pairs)	Non-breeding
	<i>Marmaronetta angustirostris</i>	91	—
	<i>Tadorna ferruginea</i>	700–800	—

Other threatened/endemic wildlife

The endemic fish *Alosa alosa* (DD) may occur.

Conservation issues

The principal human activities are agriculture, extensive livestock-grazing and fishing. The dam is suffering from siltation, exacerbated by overgrazing and poor agricultural practices in its catchment area, with an estimated one million cubic metres of sediment accruing annually. Pollution by agricultural chemicals, human disturbance of nesting waterfowl, illegal hunting and overgrazing are all threats. The site is currently unprotected, but merits priority protection and listing as a Ramsar Site. It has been classed as a priority 1 SIBE (No. H2).

Further reading

BCEOM-SECA (1995b).

Canton Forestier de Sidi Bou Ghaba

Admin region Kenitra

Coordinates 34°14'N 06°41'W

Area 652 ha

Altitude 0–77 m

MA012

A1, A3 (A01), A4i

Biological Reserve,

Forest Reserve, Ramsar Site

Site description

The site consists of the shallow dayet, or lake, of Sidi Bou Ghaba. Six kilometres long, but only 400 m broad at its widest point, the lake is enclosed between two rows of fossil dunes inland from, but parallel to, the Atlantic coast, some 30 km north of Rabat. The dunes are covered by *Juniperus phoenicea* woodland, intermixed with other woody species

such as *Pistacia lentiscus*, *Olea europea* and *Retama monosperma*. The lake is fresh water, fed by rainfall and run-off. There are extensive areas with well-developed reedbeds and marshy vegetation consisting of *Phragmites communis*, *Juncus acutus*, *J. maritimus*, *Cyperus laevigatus*, *Scirpus lacustris*, *S. holoschoenus*, and *Typha angustifolia*. The lake is fringed with *Tamarix gallica*, *Populus alba* and introduced *Eucalyptus* species. The site is accessible by a tarmac road and receives large numbers of local visitors each year (see Conservation issues).

Birds

See Box and Table 2 for key species. An important site on the Atlantic coastal flyway, the Réserve Biologique receives thousands of wintering and passage migrants every year, particularly waterfowl. Around 107 species are regularly recorded, of which 35 breed. Sidi Bou Ghaba is best known for its wintering population of *Marmaronetta angustirostris*, which can number several hundred. Around 10 pairs breed each year. *Aythya nyroca* is a passage migrant in small numbers (maximum four individuals). Of the seven species of the Mediterranean North Africa biome that occur, five breed, while two (*Falco eleonorae* and *Caprimulgus ruficollis*) are non-breeding visitors.

Key species

A1	<i>Marmaronetta angustirostris</i>		
A3 (A01)	Mediterranean North Africa biome: Seven of the 16 species of this biome that occur in Morocco have been recorded at this site; see Table 2		
A4i		Breeding (pairs)	Non-breeding
	<i>Fulica cristata</i>	20	560
	<i>Marmaronetta angustirostris</i>	—	480

Other threatened/endemic wildlife

The tortoise *Testudo graeca* (VU) occurs.

Conservation issues

The site is completely protected. The 652 ha Canton Forestier de Sidi Bou Ghaba was created in 1916. In 1951 the Canton and an additional 150 ha to its south were gazetted as a 'Site classé' by the Ministère des Affaires Culturelles (Direction des Monuments Historiques et Sites). A portion of the Canton Forestier, coincidentally also 150 ha, encompassing the southern end of the lagoon itself, was classed as a Réserve Biologique in 1974 by AEFCS. The site is a priority 1 SIBE (No. L18), and one of the country's four designated Ramsar Sites. The land belongs to the state, and is currently administered by the AEFCS. The IBA limits correspond to the Canton Forestier, and therefore include both protected areas. Existing legislation bans hunting, fishing, water-sports, collection of firewood, etc. and confers adequate protection. However, enforcement is difficult, and sometimes the sheer weight of visitor numbers can be problematic, since the lake is an extremely popular weekend picnic site. An environmental education centre, the Centre National d'Education Environnementale, with an accompanying nature trail was built in the Réserve in the 1990s by BirdLife International with funding from British Birdwatching Fair, Vogelbescherming Nederland and SPANA-UK, and support for equipping and running costs from the EU, SPANA-Morocco and AEFCS. By the beginning of 1997 it had received 30,000 visitors, including many parties of schoolchildren.

Management of the lake must ensure that accumulation of organic sediments does not gradually result in infilling and a reduction in the surface area of open water. The main potential threats are pollution from agricultural run-off and lowering of the groundwater table due to irrigation of surrounding cultivated land. A coherent management plan for the whole area is urgently required.

Further reading

BCEOM-SECA (1995c), Thevenot (1976).

Barrage Idriss Premier

Admin region Taounate

Coordinates 34°08'N 04°40'W

Area c.5,700 ha Altitude 200–310 m

MA013

A4i

Unprotected

Site description

The site is a large reservoir on the Oued Inaouen, north-east of Fès, at 200 m altitude, flooded in 1973 by the construction of the Idriss

Premier dam. The reservoir is 16 km long and mostly bordered by low, cultivated hills, although at the upstream end there is a small area of natural grassland. The average annual precipitation is 540 mm.

■ Birds

See Box for key species. Given the lack of natural vegetation around the majority of the site, its key interest is as a stopping point for Palearctic migrants. One species of the Mediterranean North Africa biome, *Phoenicurus moussieri*, occurs (see Table 2).

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Tadorna ferruginea</i>	—	260
<i>Fulica cristata</i>	—	274
<i>Grus grus</i>	—	2,032

■ Other threatened/endemic wildlife

The endemic fish *Alosa alosa* (DD) used to occur. Its current status in the reservoir is not known, and it may have been eliminated by introduced competitors and predators.

■ Conservation issues

The site is considered to be a priority 3 SIBE (No. H11). Threats include uncontrolled hunting, overgrazing and cultivation in the bed of the oued.

■ Further reading

BCEOM-SECA (1995b).

Falaise Sidi-Moussa

Admin region Rabat

Coordinates 34°06'N 06°46'W

Area 300 ha Altitude 0–60 m

MA014

A3 (A01)

Unprotected

■ Site description

The site is a coastal cliff 12 km north of the estuary of the Oued Bouregreg, north-east of Salé. The cliffs, composed of Quaternary consolidated sandstone, vary between 20 and 60 m in height and have been sculpted into a series of bays 40–400 m wide and 25–100 m deep. The site stretches approximately 6.5 km from south-west to north-east, but is very narrow and only covers a total area of 300 ha. The vegetation inland consists of scattered bushes of *Lycium intricatum* and *Solanum sodomeum*.

■ Birds

See Box and Table 2 for key species. The site is important as the only mainland nesting colony of *Falco eleonorae*—a species of the Mediterranean North Africa biome—in Morocco, and one of only three nesting colonies in the Atlantic. The birds nest on cliff-ledges and the majority of pairs occupy the higher cliffs in the southern 4 km of the site. In 1972, a total of 134 adults and juveniles was recorded; subsequent surveys have recorded fewer pairs, but these need to be treated with caution, as they have not systematically covered the whole site.

Key species

A3 (A01) Mediterranean North Africa biome: One of the 16 species of this biome that occur in Morocco has been recorded at this site; see Table 2.

■ Other threatened/endemic wildlife

None known to BirdLife International.

■ Conservation issues

Although currently unprotected the site has been proposed as a priority 2 SIBE (No. L19). It is directly threatened by many human activities, including growing urbanization of the cliffs' hinterland, disturbance of nesting birds by fishermen and walkers, increasing hunting with shotguns and catapults, and the capture of young falcons and destruction of nests. Indirect threats include intensive dumping of household and building waste and the extension of agricultural activities, including cultivation and livestock- and poultry-rearing.

■ Further reading

BCEOM-SECA (1995c), Clark (1974).

Parc National de Tazekka

Admin region Taza

Coordinates 34°06'N 04°12'W

Area 12,800 ha Altitude 1,100–1,980 m National Park, Unprotected

MA015

A3 (A01)

■ Site description

The limestone massif of Jbel Tazekka is an isolated promontory of the Middle Atlas, forming the southern side of the Taza Gap between the Middle Atlas and the Rif, about 20 km south-west of the town of Taza. The Parc National de Tazekka covers 580 ha of relict cedar forest *Cedrus atlantica* descending from the summit of Jbel Tazekka at 1,980 m to around 1,130 m. The limits of the IBA include a proposed extension that would increase the area of the park to 12,800 ha, and lower its lower altitudinal limit to around 1,100 m. This extension encompasses other types of forest and woodland, and picturesque landscapes of cliffs and caves including the tourist site of the Gouffre de Friouato, the largest and most famous cave in Morocco. The vegetation is more characteristic of the Rif than the Middle Atlas, and includes such species as *Quercus lusitanica*, *Cerastium avium*, *Adenocarpus decorticans*, *Viola mumbyensis*, *Potentilla miorantha*, *Teucrium oxylepis*, *Cistus laurifolius*, *Stipa gigantea* and *Pteris* sp. Lower down there are forests of *Quercus suber* and *Q. rotundifolia*. The park receives an annual precipitation of 1,800 mm, much of which falls as snow during the winter.

■ Birds

See Box and Table 2 for key species. A total of 54 species breeds, and 28 others (mainly passerines) have been recorded. *Falco naumanni* is a rare breeder visiting in small numbers. Of the eight species of the Mediterranean North Africa biome that occur, seven breed, while the status of *Sturnus unicolor* is unknown, although it is considered rare.

Key species

A3 (A01) Mediterranean North Africa biome: Eight of the 16 species of this biome that occur in Morocco have been recorded at this site; see Table 2.

■ Other threatened/endemic wildlife

The mammal *Hystrix cristata* (LR/nt) is present, and a reintroduction scheme for *Cervus elaphus barbarus* (LR/nt) is being undertaken by AEFCS in a 500-ha enclosure on the south-east side of Jbel Tazekka. Three endemic reptiles, *Psammodromus microdactylus*, *Ophisaurus koellikeri* and *Blanus tingitanus*, occur. The plant *Teucrium oxylepis*, a Moroccan endemic, is also found at the site.

■ Conservation issues

The 580-ha Parc National de Tazekka was created by 'Arrête viziriel' on 11 July 1950. AEFCS are seeking to extend the park to 12,800 ha, incorporating a central core zone of 2,500 ha, a 6,000-ha cork-oak production zone (Bab Azhar) and a tourist zone to include the forest of Sidi Chiker, the Gouffre de Friaouto, Ras Maa and Sidi Mejber. Human activities include livestock-rearing, agriculture and tourism.

The park is relatively well preserved, and only the eastern slopes of Jbel Tazekka appear to suffer any degree of overgrazing. The local population by and large respect the forest-conservation measures enforced by AEFCS. The recent creation of improved tourist facilities (picnic areas, tourist circuits and a small ecological museum) may lead to increased numbers of visitors, with greater difficulties of control and higher levels of disturbance to breeding birds. A further threat may be the increased use of pesticides in orchards surrounding the park, where many passerines forage.

■ Further reading

BCEOM-SECA (1995f, g), Idrissi and Khaman (1989), Zidane (1986).

Jbel Zerhoun

Admin region Meknès

Coordinates 34°04'N 05°27'W

Area c.11,000 ha Altitude 200–1,118 m

MA016

A1

Unprotected

■ Site description

The site is a wooded hill above the town of Moulay Idriss, 12 km north-east of Meknès. Stretching 15 km east–west, Jbel Zerhoun rises

to over 1,000 m from the lower-lying surrounding plains of the Saïss and Oued Kroumane at 200–400 m. The site is the only natural space remaining near the urban centres of Fès and Meknès. The town of Moulay Idriss is included within the IBA boundary. The soft rock of the formation has been eroded into numerous steep valleys and gorges, resulting in a spectacular landscape. Average annual rainfall is around 800 mm, and the natural vegetation is rich and varied—although large parts are now covered with plantations of introduced *Pinus* spp. (*P. radiata*, *P. halepensis* and *P. canariensis*).

■ Birds

See Box for key species. Jbel Zerhoun is chiefly important for its breeding population of *Falco naumanni*. Over 200 pairs have been known to nest (1995 figure) so the population may perhaps exceed A4ii thresholds. This colonial cliff-nesting species utilizes nest-sites in the ravines of Jbel Zerhoun and in and around the walled town of Moulay Idriss. Seven species of the Mediterranean North Africa biome have been recorded (Table 2): all breed except *Caprimulgus ruficollis*, a summer visitor. Many migrating Palearctic passerines and raptors also pass through the site.

Key species

A1 *Falco naumanni*

■ Other threatened/endemic wildlife

The tortoise *Testudo graeca* (VU) occurs.

■ Conservation issues

A low priority 3 SIBE (No. 30), the site is unprotected, but the *Pinus* plantations are subject to forestry regulations. Human activities include agriculture, forestry and mass tourism—the town of Moulay Idriss is the scene of an annual pilgrimage to a saint's tomb by Moroccans, and the much-visited Roman ruins of Volubilis lie just outside the boundary of the site. Overgrazing and poaching are threats, but there are a number of reforestation initiatives. It is recommended that a multiple-use protected area be created to safeguard the site as a much-needed recreational green space located close to Fès and Meknès.

■ Further reading

BCEOM-SECA (1995b), Schollaert and Franchimont (1996).

Dwiyate

Admin region Fès

Coordinates 34°03'N 05°07'W

Area 750 ha Altitude 380–400 m

MA017

A1, A4i

Royal Property

■ Site description

The site consists of two adjacent water-bodies and surrounding land and covers a total of 750 ha, between altitudes 380 and 400 m. It is located 12 km from Fès, at the north-eastern extremity of the Plaine du Saïs. To the west, the site comprises a shallow, slightly brackish pond covering 10 ha, kept artificially filled by the site managers. It is bordered by a reedbed and some mixed woodland. The larger, eastern lake covers 60 ha and is dependent on rainfall to maintain its level, which therefore varies according to the season and year. The vegetation consists of indigenous *Phragmites australis*, *Scirpus maritimus*, *Ruppia maritima*, *Carex* sp. and *Juncus* sp. with introduced *Cupressus* sp., *Pinus* sp., *Salix* sp., *Populus* sp. and *Tamarix* sp. There is also some cereal and fruit cultivation, sometimes under glass. Annual precipitation is 540 mm.

■ Birds

See Box for key species. The protected nature of the site—it is a 'Domaine Royal' with no public access—means that birds are largely undisturbed, and it is therefore of great importance to migrating waterfowl and other species. Around 180 species have been recorded, of which up to 80 are definite or potential breeders. Three other waterfowl species occur in good numbers, sometimes approaching threshold numbers: *Anas clypeata* (winter maximum 3,658 individuals in 1989); *Glareola pratincola* (normally between several dozens and a hundred wintering individuals; regular breeder with up to a maximum of a dozen pairs); and *Tadorna ferruginea*. Up to 20 *Aythya nyroca*

have been recorded (in 1963) and *Falco naumanni* is a passage migrant. In addition, three species of the Mediterranean North Africa biome are present (see Table 2).

Key species

A1 *Marmaronetta angustirostris*

A4i	Breeding (pairs)	Non-breeding
<i>Marmaronetta angustirostris</i>	—	500–600
<i>Fulica cristata</i>	25+	1,000

■ Other threatened/endemic wildlife

None known to BirdLife International.

■ Conservation issues

The site is a protected 'Domaine Royal' in which hunting is prohibited, and is a priority 1 SIBE (No. H10). Recommended conservation measures include maintaining the protection of the western lake, fencing the eastern lake to prevent livestock access, formalizing the protection of the site by including it as a Moroccan Ramsar Site, and carrying out a study of the lake's hydrobiology.

■ Further reading

Franchimont *et al.* (1990).

Parc Naturel d'Ifrane

Admin region Ifrane

Coordinates 33°25'N 05°10'W

Area 50,000 ha

Altitude 1,225–2,103 m

MA018

A1, A3 (A01), A4i

Natural Park,

Hunting Reserve, Ramsar Site

■ Site description

The site is a 50,000 ha proposed Natural Park stretching for some 40 km between the towns of Ifrane and Azrou in the west central Middle Atlas. The area is part of the drainage basin of the Oued Sebou. Although lying between 1,225 and 2,103 m, the relief is rather gentle, in contrast to the steeper slopes of the eastern Middle Atlas. The landscape is typically karstic, scattered with dolines, some of which are occupied by lakes, e.g. Dayet Aoua, Dayet Hachlaf, Aguelmane Afennourir. The latter, covering 380 ha and lying at 1,800 m, is one of Morocco's four designated Ramsar Sites. It is actually a shallow marsh, in which water is artificially retained by a low dyke, and is nowhere more than 2 m deep. In exceptional drought years (e.g. 1995) it can dry out completely. Dayet Aoua occupies about 50 ha and is relatively well conserved. Annual precipitation is 1,100 mm, much of which falls as winter snow (one of Morocco's two ski-resorts lies just to the west of the park boundary).

The park contains some of the most densely wooded parts of the country, although these only cover a small portion of its area. The principal woody species are cedar *Cedrus atlantica* and oak *Quercus rotundifolia*, but *Q. faginea*, *Juniperus oxycedrus*, *J. thurifera*, *Ilex aquifolium*, *Crataegus laciniata* and *Pinus pinaster* are also relatively common. The non-woody flora is also very rich, although there are few endemic species. Aguelmane Afennourir is surrounded by *Juncus bufonius*, and there are several islets of *Scirpus holoschoenus*. The park is relatively sparsely populated. The principal economic activity of the inhabitants is the rearing of livestock, particularly sheep, but there are increasing levels of tourism.

■ Birds

See Box and Table 2 for key species. The avifauna of the park is exceptionally rich, with around 142 known species, of which 120 breed, including small numbers of *Marmaronetta angustirostris* and *Falco naumanni*. Of the nine species of the Mediterranean North Africa biome that occur, eight breed while the remaining one, *Sylvia cantillans*, is only a scarce summer visitor (Table 2). Many Palearctic passage migrants pass through the park, and, depending on conditions, the lakes can also host large numbers of waterfowl. At Aguelmane Afennourir two species, *Tadorna ferruginea* and *Fulica cristata*, often exceed IBA threshold values as winter visitors and regularly breed in small numbers on its islets. Dayet Aoua can hold large numbers of *Fulica cristata*, and up to 1,200 *Marmaronetta angustirostris* have been observed. *Geronticus eremita* was once common, but has disappeared from the region since 1981 and has only rarely been seen since—most

recently at Aguelmane Afenourir in June 1994. *Numenius tenuirostris* has also been recorded once, as a passage visitor in 1964.

Key species

A1	<i>Marmaronetta angustirostris</i>	
A3 (A01)	Mediterranean North Africa biome: Nine of the 16 species of this biome that occur in Morocco have been recorded at this site; see Table 2	
A4i	Breeding (pairs)	Non-breeding
	<i>Marmaronetta angustirostris</i>	— 1,200
	<i>Tadorna ferruginea</i>	Breeds 650
	<i>Fulica cristata</i>	Breeds 750

Other threatened/endemic wildlife

Although the carnivore *Panthera pardus panthera* (CR) formerly occurred, it is now extinct. The primate *Macaca sylvanus* (VU) is still reasonably common in the forested areas of the park. Six endemic reptiles are also present.

Conservation issues

The Parc Naturel d'Ifrane is in the process of being created, and a detailed management plan has been prepared. Surveillance of the area has already been undertaken by several foresters of the AEFCS. Aguelmane Afennourir is a Ramsar Site and is classed as a priority 1 SIBE (No. H21), whilst Dayet Aoua is classed as a priority 3 SIBE (No. H15). An area of 250 ha of the Aguelmane Afennourir has been gazetted as a hunting reserve and a fishing reserve since 1980. Among the threats to the park are overgrazing, poaching (including hunting with guns and the collection of eggs of nesting waterfowl), and the impacts of mass tourism (litter, pollution of lakes) since the towns of Azrou and Ifrane are popular summer resorts, whilst the latter is also a winter-sports resort. Many of the lakes are progressively drying up due to the creation of new wells around their basins and increased water extraction lowering the underlying water-table, coupled with high rates of sedimentation. Pollution from agroindustry, including intensive chicken farms, may also be a problem. The main conservation requirement is the speedy implementation of the management plan and official gazettelement of the park.

Further reading

BCEOM-SECA (1995b, h, i), Green and El Hamzaoui (1998).

Région Fouchal–Matarka

Admin region Figuig, Oujda

Coordinates 33°20'N 02°13'W

Area 490,000 ha Altitude 1,060–1,310 m

MA019

A3 (A01)

Unprotected

Site description

The site is a large triangular area of plateau, its northern apex situated at the village of Al Fouchal some 25 km south of Aïn Beni Mathar, its south-western corner at the village of Matarka, and its eastern boundary formed by the Oujda–Figuig road. Vegetation consists mainly of arid tussock-grass *Stipa tenacissima*–*Artemisia inculata* steppe. There are several gueltas/temporary ponds (e.g. Guelta El Beida, Dayet Oum Slimane). The principal economic activity is extensive livestock-rearing.

Birds

See Box and Table 2 for key species. Approximately 100 species have been recorded, including *Chlamydotis undulata* and large flocks of sandgrouse (an estimated 100,000 *Pterocles alchata* were observed in December 1993). Five species of the Sahara–Sindian biome also occur (see Table 2). In December 1993, 73 wintering *Charadrius morinellus* were recorded in a small part of this vast site, leading to the suspicion that numbers of this cryptic, hard-to-census species may exceed the threshold for qualification as an IBA under the A4i criterion.

Key species

A3 (A01) Mediterranean North Africa biome: Nine of the 16 species of this biome that occur in Morocco have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

The mammal *Gazella dorcas* (LR/nt) occurs.

Conservation issues

The site is unprotected. Threats include overgrazing and hunting.

Région Jorf Lasfar

Admin region El Jadida

Coordinates 33°10'N 08°38'W

Area 400 ha Altitude 0–56 m

MA020

A4i

Unprotected

Site description

Located on the Atlantic coast, 24 km south of El Jadida, the southern part of this 400 ha site consists of consolidated sandstone cliffs up to 56 m high, whilst the northern part is comprised of a rocky plateau up to 300 m wide, intercut by creeks and sand- and pebble-beaches. The surface of this plateau contains many shallow hollowed-out basins 1–4 m deep, filled with marshy vegetation. The sparse terrestrial vegetation of the site consists mainly of scattered bushes of *Lycium intricatum*. However, seaweeds (Laminariaceae) grow in profusion at the foot of the cliffs, including *Chorda filum*, *Alaria* sp., *Agarum oibrosom*, *Laminarium digitata* and *Laminaria agardhii*. The abundant invertebrate fauna includes polychaetes such as *Marphysa sanguinea*, *Clymenella* sp. and *Amphitrite* sp., oligochaetes and bivalve molluscs such as *Mytilus edulis* and *Modiolus modiolus*. The site is bordered inland by uncultivated fields and a tarmac road, and to the north by the village of Moulay Abdallah.

Birds

See Box for key species. The site is an important wintering and migratory staging-post, offering as it does abundant food-sources for waders and other waterbirds. At least 38 species have been recorded, including (in 1993) a single *Numenius tenuirostris*. *Arenaria interpres* is regularly present in large numbers, while *Larus audouinii* is often present in small numbers. An important nesting population of *Apus pallidus* breeds in the cliffs, but has never been censused/studied.

Key species

A4i	Breeding (pairs)	Non-breeding
<i>Arenaria interpres</i>	—	800

Other threatened/endemic wildlife

The site has a high diversity of reptiles and amphibians—16 species have been recorded, of which four are endemic.

Conservation issues

The site is a priority 2 SIBE (No. L23). Conservation threats so far identified include pollution from an industrial phosphate complex located at the southern end of the site; the dumping of household waste, sewage and construction rubble from the cliffs; disturbance of birds by fishermen; the illegal capture and sale of birds of prey; and the degradation of the seaweed beds by over-quarrying of the rock platform. Protected-area status and legislation are urgently needed, together with the implementation of an action plan to safeguard the site.

Further reading

BCEOM-SECA (1995c).

Aguelmane n'Tifounassine

Admin region Ifrane

Coordinates 33°09'N 05°06'W

Area c.400 ha Altitude 1,910–2,000 m

MA021

A4i

Unprotected

Site description

A small freshwater lake in the Middle Atlas, 40 km from Azrou on the road to Midelt, about 9 km south of the village of Timahdit, situated at 1,910 m in a mountain bowl whose surrounding slopes extend upwards to 2,020 m. The wetland itself is composed of three parts: a deep, permanent lake occupying a small crater; a larger but shallower spring-fed lake located to the south, often muddy and marshy; and a large marshy zone, often dry for large parts of the year and used by livestock. The site is heavily overgrazed and vegetation is only luxuriant in the wetter areas, which consist of

Phragmites and *Typha* beds. In addition to livestock, the site is also used by fishermen.

■ Birds

See Box for key species. Several wildfowl species winter at the site, but only *Tadorna ferruginea* and *Anas platyrhynchos* have been recorded in any numbers (500 of the latter in 1993).

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Tadorna ferruginea</i>	—	302
<i>Fulica cristata</i>	<13	195

■ Other threatened/endemic wildlife

None known to BirdLife International.

■ Conservation issues

Land-ownership is public. The site currently suffers from overgrazing, and at least in some parts from siltation, leading to progressive habitat modification with as yet unknown effects. The site is a priority 2 SIBE (No. H22). Further survey and monitoring are required, and protective measures are recommended.

■ Further reading

BCEOM-SECA (1995b).

Aguelmane de Sidi Ali Ta'nzoult

Admin region Khénifra

Coordinates 33°04'N 05°00'W

Area c.1,750 ha Altitude 2,078–2,395 m

MA022

A4i

Unprotected

■ Site description

The Aguelmane de Sidi Ali Ta'nzoult is one of the most important natural lakes in Morocco, both in terms of its area (500 ha) and its depth (36 m). Situated in a volcanic depression at 2,078 m, 18 km south of the village of Timahdit in the Middle Atlas, the lake is dominated by the ridge of Jbel Sidi Ali, rising to the summit of Jbel Bouyizane (2,395 m). The eastern shore of the lake is bordered by steep slopes wooded with *Cedrus atlantica*, *Juniperus thurifera* and *Quercus rotundifolia*. On other sides the lake is surrounded by a large marshy plain (Ta'nzoult), watered by a spring-fed stream, and the vegetation is composed of *Juncus*, *Rumex* and *Scirpus* species. The site includes the marshy plain and the slopes rising to the summit of Jbel Bouyizane, a total area of approximately 1,750 ha. Annual precipitation is 1,100 mm.

■ Birds

See Box for key species. Both *Tadorna ferruginea* and *Fulica cristata* nest in small numbers at the site, but are primarily noteworthy as wintering species. Many other waterfowl also winter (e.g. *Anas penelope* and *Fulica atra*) but do not exceed A4i thresholds. Five species of the Mediterranean North Africa biome occur (see Table 2).

Key species		
A4i	Breeding (pairs)	Non-breeding
<i>Tadorna ferruginea</i>	—	400
<i>Fulica cristata</i>	—	760

■ Other threatened/endemic wildlife

The primate *Macaca sylvanus* (VU) occurs in the wooded part of the site. The lake used to harbour an endemic trout *Salmo pallaryi*, but it has disappeared following the introduction of exotic predatory fish.

■ Conservation issues

Although currently unprotected the site is a priority 2 SIBE (No. H25). Land-ownership is public, and the site is exploited for pasture, wood-collection, fishing and tourism. It is heavily used by both tourists and local people, partly due to its ease of access (it is located only 1.5 km from a tarmac road), and visitor pressure is thought to disturb bird activity and increase pollution and deforestation. Overgrazing is also a problem, destroying natural vegetation and increasing soil erosion and sedimentation in the lake. Conservation measures are needed, in particular to protect the nesting populations of *Tadorna ferruginea* on the Ta'nzoult plain.

■ Further reading

BCEOM-SECA (1995b).

Sidi Moussa–Oualidia

Admin region El Jadida

Coordinates 32°53'N 08°50'W

Area c.4,000–5,000 ha Altitude 0–60 m Permanent Hunting Reserve

MA023

A1, A4i

■ Site description

Situated between the village of Sidi El Abed (35 km south of El Jadida) and the small town of Oualidia, the site consists of the two lagoons of Sidi Moussa and Oualidia linked by a series of salt-harvesting pans and marshes. Although almost 40 km long, the site is extremely narrow (200–800 m) since it occupies an inter-dunal depression between two rows of dunes lying parallel to the Atlantic coast. The inland dune row is fossilized and forms a cliff of consolidated deposits up to 60 m high, while the coastal dunes are essentially mobile, but stabilized in some places by cultivation or planting. The site is fed by seawater, both through natural tidal inflow entering the two lagoons and artificially through the pumping of water into the salt pans. Fresh water enters the site through run-off from the inland cliffs and seepage from the water-table.

The lagoons are relatively undisturbed and support beds of marine algae and seagrass *Spartina maritima*. Fringing saltmarsh vegetation includes halophytic species such as *Sarcocornia perennis*, *Suaeda fruticosa*, *Atriplex glauca*, *A. portulacoides*, *Limonium* spp., *Spergularia salina*, *Juncus rigidus*, etc. The few freshwater marshy regions consist of *Juncus acutus*, *Typha* and *Phragmites* spp. Most of the natural dunal vegetation has been replaced by cultivation, which on the inland side includes market gardening under greenhouses. Other human activities at the site include oyster farming, shellfish harvesting, fishing and tourism.

■ Birds

See Box for key species. The complex is an extremely important passage and wintering site for Palearctic migrants on the Atlantic coast flyway. Over 80 species have been recorded, of which 50 are regular, including two species of the Mediterranean North Africa biome (see Table 2). Gulls, terns and waders are the commonest migrants, with an average of around 10,000 waders recorded at the site. Many species must pass through the site in large numbers, but only a few are currently confirmed to have exceeded threshold levels. Nonetheless the site regularly holds up to 3,000–4,000 ducks of 11 species, and *Ardea* spp., *Fulica* spp., *Platalea leucorodia* and *Phoenicopterus ruber* are common. *Numenius tenuirostris* was a former wintering visitor with a maximum of seven individuals observed, but has not been seen in recent years. During the spring and summer the site is almost deserted by waterbirds and only a few species breed, undoubtedly because of high levels of human disturbance.

Key species

A1	<i>Marmaronetta angustirostris</i>	<i>Larus audouinii</i>	
A4i		Breeding (pairs)	Non-breeding
	<i>Marmaronetta angustirostris</i>	—	1,420
	<i>Himantopus himantopus</i>	—	1,340
	<i>Larus audouinii</i>	—	670

■ Other threatened/endemic wildlife

Pelobates varaldii, an endemic Moroccan amphibian, is present at the site.

■ Conservation issues

The site is classified as a Permanent Hunting Reserve and was identified as a priority 1 SIBE (No. L24). The two lagoons, Sidi Moussa and Oualidia, are under the jurisdiction of the Service des Travaux Publics, whilst the other wetland areas fall under the administration of AEFCS. Potential threats include increasing urbanization and tourist development, pollution from pesticides and fertilizer run-off, illegal hunting and destruction of vegetation. The development of an integrated management plan is recommended, incorporating both stricter hunting controls and enforcement and the prohibition of access to certain areas during the breeding season.

■ Further reading

BCEOM-SECA (1995c), Jacoby (1997).

Barrage al Massira

Admin region Kelaat Sraghna, Settat

Coordinates 32°30'N 07°30'W

Area c.14,000 ha Altitude 265 m

MA024

A1, A4i, A4iii

Unprotected

Site description

The site is the second-largest man-made reservoir in Morocco, on the Oued Oum Er-Ribi'a, located approximately 50 km south of Settat. Lying at an altitude of 265 m, the reservoir is around 30 km long, has a surface area of 14,000 ha, and a maximum depth of 60 m. Situated in a hilly valley, the reservoir's border is heavily indented and there are many islets, some of which only emerge when the water-level is low. The reservoir's shores are mainly rocky, and are partly wooded with *Eucalyptus* and *Acacia* species. Aquatic plants such as algae and *Potamogeton* grow in profusion along a 10–50-m-wide strip around the reservoir's edge. When the water-level drops, exposed mudbanks and the drying aquatic plants provide extensive feeding habitat for waterbirds. Average annual precipitation is 200 mm.

Birds

See Box for key species. The Barrage al Massira regularly harbours large numbers of wintering waders and waterfowl: 42,000 birds were counted in January 1993 and 55,000 in January 1995, of more than 30 different species. *Marmaronetta angustirostris* is a regular wintering visitor; 1,973 were recorded in January 1993 and 280 in January 1995. In addition to those listed below, maxima of 7,000 *Anas penelope*, 4,000 *Aythya ferina* and 20,000 *Fulica atra* have been noted. Around 20 waterbird species are summer/breeding visitors, mainly breeding on the islets in the reservoir. It is suspected that *Fulica cristata* may also approach threshold levels, but no data are available.

Key species

A1	<i>Marmaronetta angustirostris</i>		
A4i		Breeding (pairs)	Non-breeding
	<i>Tadorna ferruginea</i>	—	400
	<i>Anas clypeata</i>	—	7,000
	<i>Marmaronetta angustirostris</i>	—	1,973
	<i>Sterna nilotica</i>	—	300
A4iii	The site regularly holds 40,000–50,000 waterbirds.		

Other threatened/endemic wildlife

None known to BirdLife International

Conservation issues

The reservoir is a priority 1 SIBE (No. H29). It is public land, administered by AEFCS and the Service des Travaux Publics. There is a small commercial fishery, and the reservoir and its shores are also used by sport-fishermen and livestock. The main threat is disturbance of nesting birds: on the islets, principally by fishermen; around the borders of the reservoir by grazing flocks of sheep. The site merits inclusion on the list of Moroccan Ramsar Sites, and requires the implementation of an appropriate management plan.

Further reading

BCEOM-SECA (1995b).

Parc National du Haut Atlas Oriental

Admin region Khénifra, Errachidia

Coordinates 32°15'N 05°25'W

Area 55,252 ha Altitude 1,645–3,102 m

MA025

A3 (A01)

Unprotected

Site description

A proposed National Park, this site covers 55,252 ha of the High Atlas between Midelt and Er Rachidia. The base rock consists of limestone with some igneous intrusions. The site ranges in altitude from 1,645 m in the bed of the Oued Arheddou to 3,102 m at the summit of Jbel Tanrhout. At its western end it includes the twin lakes of Isli and Tislite, near Imilchil. The northern slopes enjoy an annual precipitation of 400–600 mm, and are consequently well-wooded, while the southern slopes are drier, receiving only 200–300 mm, and are more open. Winter snows are abundant and long-lasting at the higher elevations. On the northern side, woody vegetation consists of dense cedar *Cedrus atlantica* and

pine *Pinus pinaster maghrebiana* forests, oak *Quercus rotundifolia* woodland, open *Juniperus thurifera* woodland and, at lower altitudes, some pine *Pinus halepensis*. The mountain summits and high plateaus support xerophytic steppe vegetation, and there is some grassland in wetter areas. On the southern slopes cedar woodland is disappearing, but sparse oak and pine woodland persists. Steppe vegetation is predominant, dominated by alfa *Stipa tenacissima* at lower altitudes.

Birds

See Box and Table 2 for key species. Ninety-five breeding species have been reported, including two Sahara–Sindian biome species (Table 2), as well as many raptor species. However, three vultures, *Gyps fulvus*, *Neophron percnopterus* and *Gypaetus barbatus*, have recently disappeared, and populations of *Aquila chrysaetos* and *Buteo rufinus* have also crashed.

Key species

A3 (A01) Mediterranean North Africa biome: Eight of the 16 species of this biome that occur in Morocco have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

The last confirmed Moroccan report of the carnivore *Panthera pardus panthera* (CR) came from the site in 1993, but it is feared locally extinct. Three other globally threatened mammals are present: an important and increasing population of *Ammotragus lervia* (VU), estimated at 200 animals in 1996; small numbers of *Macaca sylvanus* (VU); and *Gazella cuvieri* (EN), which is fairly regularly seen in a proposed eastern extension to the park. Two endemic reptiles, *Quedenfeldtia moerens* and *Lacerta andreanskyi*, are present, and a third, *Ophisaurus koellikeri*, is suspected to occur. A total of 52 species, subspecies or varieties of plant endemic to Morocco or considered nationally rare are also known from this site.

Conservation issues

The area has been proposed as a National Park, but has not yet been gazetted. The twin lakes near Imilchil have both been identified as SIBEs, Tislite as priority 1 (No. H34) and Isli as priority 2 (No. H33). A small enclosure of 10 ha has been made into a reserve near the Maison Forestière de Tirrhist and is frequented by *Ammotragus lervia*, which are given supplementary feed in the winter. Although only three villages are located within the park limits, at least 25 are located close to its boundaries. In 1993, it was estimated that 18,000 people traditionally used the park's resources. Activities include extensive transhumant pastoralism of goats and sheep, irrigated agriculture, and, somewhat surprisingly, mass tourism—since the remote village of Imilchil receives thousands of visitors once a year on the occasion of a famous traditional Berber marriage festival.

Threats to the site include overgrazing and deforestation for fuel and timber, which have caused widespread soil erosion and pasture degradation. Damage to the cedar woodland is extensive. The reedbeds at Tislite are rapidly disappearing due to the activities of fishermen and holidaymakers, leading to a decline in nesting waterfowl. Raptor populations have also declined sharply in the past 10 years due to strychnine poisoning campaigns targeting livestock predators. A detailed management plan for the proposed park has already been drawn up under the auspices of AEFCS: the site now needs gazettelement and implementation of the plan.

Further reading

BCEOM-SECA (1995b, m, n), Ou Tahar (1994)

Jbel Krouz

Admin region Figuig

Coordinates 32°08'N 01°45'W

Area 60,000 ha Altitude 975–1,920 m

MA026

A3 (A02)

Unprotected

Site description

Jbel Krouz is a rugged Saharan limestone massif, around 90 km long and 12 km wide, located to the west of the town of Figuig near the Algerian border. Vegetation consists of arid steppe of tussock-grass *Stipa tenacissima* at lower altitudes and degraded *Juniperus phoenicea* woodland on the mountain summits. Other common plant species include *Artemisia inculta* and *Rosmarinus officinalis*. The principal human activity is pastoralism.

Birds

See Box and Table 2 for key species. Approximately 60 species have been recorded, including 13 breeding species of the Sahara–Sindian biome, of which one, *Caprimulgus aegyptius*, occurs as a summer visitor. Up to four species of the Mediterranean North Africa biome may be present, but have not yet been confirmed. *Chlamydotis undulata* occurs in the steppe zone.

Key species

A3 (A02) Sahara–Sindian biome: 13 of the 15 species of this biome that occur in Morocco have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

Three threatened ungulates—*Ammotragus lervia* (VU), *Gazella dorcas* (LR/nt) and *Gazella cuvieri* (EN)—are reported from the site. The threatened tortoise *Testudo graeca* (VU) and the endemic Moroccan toad *Bufo brongersmai* also occur.

Conservation issues

The site is currently unprotected, but is a priority 1 SIBE (No. 69). It is suffering from overgrazing and over-exploitation of woody species for fuelwood, together with over-hunting of game species. An integrated management plan incorporating ecotourism is required, and the site could potentially be considered for gazettelement as a National or Natural Park.

Further reading

BCEOM-SECA (1995b).

Sahb al Majnoun

Admin region Kelaat Spaghna
Coordinates 32°07'N 07°45'W
Area 2,000 ha Altitude 405 m

MA027

A4i
Unprotected

Site description

The site is a large, shallow, wetland depression 17 km long and 2.5 km wide in the eastern Bahira basin, between the villages of Beguerir and Al Qal'a des Sraghna. Due to large-scale water extraction and lowering of the water-table, the site is now mainly fed by rainfall and run-off. It can be flooded for 2–4 months each year, particularly in the northern sector, and periods of flooding alternate with dry periods. The soil is salty clay, and erosion lines of run-off, and livestock and human tracks, scour its surface—the latter attesting to heavy usage outside periods of flooding. The natural vegetation consists of halophytic steppe. Around the edges of the sebkha, cultivation is increasing and gradually reducing the area of the wetland through drainage: the sebkha itself is used as rough sheep-pasture during dry periods. The climate is arid with mild winters.

Birds

See Box for key species. In wet years the site can attract up to 4,000 wintering waterbirds of c.20 species. Waders are common, while up to 800 *Anas crecca* and 100 *Tadorna ferruginea* have been recorded, together with small numbers (up to 15) of the globally threatened *Marmaronetta angustirostris*. Up to 100 *Phoenicopus ruber* and *Grus grus* have also been observed.

Key species

A4i	Breeding (pairs)	Non-breeding
<i>Charadrius alexandrinus</i>	—	3,000

Other threatened/endemic wildlife

None known to BirdLife International

Conservation issues

The site has no legal protection and is a priority 3 SIBE (No. H31). The major threat appears to be overgrazing during dry periods by large numbers of sheep. The creation of a reserve covering at least part of the Sahb is strongly recommended.

Further reading

BCEOM-SECA (1995b).

Sebkha Zima

Admin region Safi
Coordinates 32°05'N 08°40'W
Area 600 ha Altitude 359–364 m

MA028

A1, A4i
Unprotected

Site description

A large, but temporary, inland wetland lying south-east of Safi near the town of Chemaia, Sebkha Zima lies in a depression and is fed by several rain-dependent streams. The substrate is saline, with around 40% of the bed of the sebkha given over to salt pans, and the wetland is surrounded by a belt of halophytic vegetation. During wet periods a thick cover of filamentous algae develops on soil surfaces, attracting large numbers of waterbirds. However, the Sebkha is often dry by the end of June. Average annual precipitation is 150–200 mm.

Birds

See Box for key species. In wet years Sebkha Zima can attract up to 10,000 wintering waterbirds. Several ducks are regularly seen in flocks numbering over 1,000, including *Anas penelope*, *Anas clypeata*, *Tadorna tadorna* and *Anas acuta*. Waders such as *Calidris* and *Tringa* spp. also visit and winter, as do flocks of *Larus* spp. numbering several hundred. Only a few species breed, among them *Charadrius alexandrinus*, *Himantopus himantopus* and *Gelochelidon nilotica*.

Key species

A1	Breeding (pairs)	Non-breeding
<i>Marmaronetta angustirostris</i>	—	—
A4i		
<i>Phoenicopus ruber</i>	—	5,000
<i>Tadorna ferruginea</i>	—	300
<i>Marmaronetta angustirostris</i>	—	200

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

The site is a priority 2 SIBE (No. H30). It has no legal protection and is threatened by the expansion of industrial salt-extraction, which is largely mechanized. Recommended conservation measures include limiting this expansion and restricting access to parts of the site during the breeding season to reduce disturbance of nesting birds.

Further reading

BCEOM-SECA (1995b), El Agbani (1997).

Archipel d'Essaouira

Admin region Essaouira
Coordinates 31°30'N 09°48'W
Area 26.7 ha Altitude 0–29 m

MA029

A3 (A01), A4ii
Permanent Biological Reserve

Site description

The site is a small archipelago, also known as 'Les Iles Purpuraires', consisting of the Ile de Mogador and several associated islets, only some 800 m offshore from the Atlantic coastal port of Essaouira. The islands are composed of stabilized and fossilised sand-dunes, and consist of largely flat terrain broken by holes and fissures. The highest point on the islands is only 29 m. The chief plant species are *Lycium intricatum*, *Suaeda fruticosa* and *Mesembryanthemum crystallinum*.

Birds

See Box and Table 2 for key species. The site harbours the world's largest breeding colony of *Falco eleonorae* and is one of only three nesting sites known on the Atlantic coast of Africa (two in Morocco and one in the Canary Islands). Although normally a cliff-nesting species, on the Archipel d'Essaouira *Falco eleonorae* nests on the ground, often in cavities one or two metres deep. Another eight species regularly nest, including 4,000 pairs of *Larus argentatus*—the largest colony in Morocco. In addition the islands harbour one of the major Moroccan colonies (60–70 pairs) of *Phalacrocorax carbo maroccanus*, a subspecies restricted to Morocco and Mauritania. In April 1997, eight breeding pairs of *Apus unicolor*, a restricted-range species (of the Madeira and Canary Islands Endemic Bird Area, EBA 120) which only occasionally breeds in Morocco, were reported.

Key species

A3 (A01) Mediterranean North Africa biome: One of the 16 species of this biome that occur in Morocco has been recorded at this site; see Table 2.

A4ii	Breeding (pairs)	Non-breeding
<i>Falco eleonorae</i>	180	—

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

The site is a Permanent Biological Reserve and has been identified as a priority 1 SIBE (No. L26). Access by tourists and fishermen is forbidden, although the control of unauthorized landings is a problem for the Eaux et Forêts warden. This measure has apparently reduced the collection of gulls and falcons' eggs, with a resultant increase in their populations. Surveillance needs to be maintained and reinforced, as every year some visitors succeed in landing on the islands without a permit and disturbing nesting birds.

Further reading

BCEOM-SECA (1995c), Clark (1981), Thevenot *et al.* (1981).

Piste de Tagdilt

Admin region Ouarzazate

Coordinates 31°20'N 05°55'W

Area 13,000 ha Altitude 1,450–1,690 m

MA030

A3 (A01, A02)

Unprotected

Site description

The site consists of the track running south–east from Boumalne-du-Dadès to the village of Tagdilt, and the surrounding stony reg, cut by the beds of numerous small, temporary wadis. Vegetation consists of spiny xerophytic plants. Principal activities are livestock-rearing and ecotourism.

Birds

See Box and Table 2 for key species. The site is renowned for its diversity of lark species. A total of 41 bird species is known, of which 32 breed, including *Chlamydotis undulata*. The latter was once regularly observed, but has declined drastically due to over-hunting.

Key species

A3 (A01) Mediterranean North Africa biome: Seven of the 16 species of this biome that occur in Morocco have been recorded at this site; see Table 2.

A3 (A02) Sahara–Sindian biome: Eight of the 15 species of this biome that occur in Morocco have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

The site is unprotected. Threats include overgrazing and hunting by locals and Arab visitors. The potential for revenue generation from ecotourism exists, since the site features on the itinerary of many birdwatching tourists visiting Morocco. Classification as a SIBE and the preparation of a management plan are urgently needed.

Further reading

Combridge and Snook (1997).

Oued Matil–Ksob

Admin region Essaouira

Coordinates 31°19'N 09°17'W

Area 350 ha Altitude c.500–800 m

MA031

A1, A4i

Unprotected

Site description

Lying in a mountainous region to the north of the High Atlas, 65 km south-east of Essaouira, the site consists of 7 km of the watercourse of the Oued Matil, which along this section passes between cliffs. The site covers 350 ha and varies in altitude from 500 m to 800 m. The valley bed is heavily cultivated.

Birds

See Box for key species. The cliffs are the main interest of this area, formerly harbouring a colony and roost of *Geronticus eremita*. However, the site has only been visited infrequently by ornithologists. On 27 May 1988, seven birds were seen coming in to roost in the evening. The site was revisited in July 1995 and April 1996. No *G. eremita* were observed, but local people insisted that they had been seen in small numbers in the previous two to three months. Although inconclusive, this does leave open the possibility that birds are visiting the area during the breeding season. It is therefore possible that some *G. eremita* still nest either upstream or downstream of the site, or that they may eventually recolonize the former colony site. The cliffs do continue to host breeding *Ciconia ciconia* and raptors. In addition, six breeding species of the Mediterranean North Africa biome occur (see Table 2).

Key species

A1 *Geronticus eremita*

A4i *Geronticus eremita*

Breeding (pairs)

—

Non-breeding

7 (1988)

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

Oued Matil is currently unprotected. Agricultural activity at the site appears to have intensified over the last 10 years, and the amount of steppe and non-cultivated area has consequently decreased. This may have reduced the available area of feeding habitat for *G. eremita*, leading to the abandonment or relocation of the breeding colony. A detailed survey for the species should be carried out at the site and its immediate surroundings.

Merzouga/Tamezguidat

Admin region Errachidia

Coordinates 31°10'N 04°00'W

Area c.22,700 ha Altitude 699–922 m

MA032

A1, A3 (A02), A4i

Unprotected

Site description

The site lies in the Tafilelt 30 km south-east of Erfoud. It consists of the highest sand-dune in Morocco, Erg Chebbi, and a seasonal lake variously known as Lac de Merzouga, Dayet Srij or Tamezguidat. The dune rises to 922 m, over 200 m higher than the surrounding plain and the level of the lake (699 m), creating a spectacular desert landscape that attracts thousands of tourists each year. The rain-fed lake normally contains water from November to May, but in exceptionally wet years persists until August. Average annual rainfall is 200 mm per year. The vegetation cover is therefore sparse and, except for a lawn of *Cyperus* spp. around the lake, consists of scattered clumps of *Acacia* and *Tamarix* spp. with some perennial and annual grasses.

Birds

See Box and Table 2 for key species. This temporary lake is the most important water-body in the Tafilelt, and attracts thousands of migrating waterbirds. Up to 3,500 *Marmaronetta angustirostris* have been recorded historically (1973), but more recent records are all in the range of 300–400. There is an unconfirmed report of 2,000 *Tadorna ferruginea* in November 1996 (600 confirmed at another date in the same year). The lake frequently harbours flamingos (e.g. 400 in 1996), which are a major tourist attraction. The avifauna is very rich and diverse, with c.130 recorded species. Of the 14 species of the Sahara–Sindian biome that have been recorded, 13 breed; of the 15 such species in Morocco, only *Hirundo obsoleta* has never been recorded here (Table 2). Also present are three species of the Mediterranean North Africa biome (see Table 2), of which two—*Ramphocoris clotbey* and *Eremophila bilopha*—occur at few other Moroccan IBAs. The area harbours a declining population of *Chlamydotis undulata*, and is probably the last Moroccan site for *Ardeotis arabs* (observed infrequently between 1987 and 1993).

Key species

A1 *Marmaronetta angustirostris*

A3 (A02) Sahara–Sindian biome: 14 of the 15 species of this biome that occur in Morocco have been recorded at this site; see Table 2.

Key species ... continued

A4i	Breeding (pairs)	Non-breeding
<i>Tadorna ferruginea</i>	—	600–2,000
<i>Marmaronetta angustirostris</i>	—	300–400

Other threatened/endemic wildlife

Among the c.20 mammal species identified from the site are the rare *Felis margarita* and *Gazella dorcas* (LR/nt).

Conservation issues

The site is Morocco's foremost ecotourist destination, with walking trips, camel and horse excursions and birdwatching all on offer at the many small tourist hotels that have sprung up around the Erg Chebbi, in addition to four-wheel-drive-vehicle safaris. However, the unregulated nature of the development has led to unsightly construction and waste-disposal problems. Vegetation erosion due to vehicles is occurring on some dunes, but the overall impact on terrestrial bird species is probably negligible at present. More serious is the frequent disturbance of waterbirds at the lake by tourists taken by guides to see the flamingos. Locals also reportedly collect eggs of nesting waterfowl, and hunting has almost driven the local population of *Gazella dorcas* to extinction. Although currently unprotected, the site has been designated as a priority 2 SIBE (No. H43). Strong conservation measures should be enacted rapidly and enforced in collaboration with the local community: these stand an extremely good chance of becoming self-financing if a levy is extracted from tourists.

Further reading

BCEOM-SECA (1995b).

Parc National de Toubkal

Admin region Houz, Ourzazate, Taroudant
Coordinates 31°04'N 07°55'W
Area 36,000 ha Altitude 1,000–4,167 m

MA033

 A3 (A01)
National Park

Site description

The site is a National Park covering 36,000 ha of the High Atlas, including the highest mountain in Morocco, Jbel Toubkal (4,167 m). Located only 60 km south of the town of Marrakech, the dramatic mountain scenery attracts thousands of visitors each year, many of whom climb Jbel Toubkal or trek elsewhere in the park. The mountain summits are often only slightly above the level of their surrounding high plateaus, which are separated by deep valleys. The park extends from 1,000 m upwards and therefore encompasses a range of vegetation-types, from forest to alpine meadow. Forest only covers 15% of the park, and consists mainly of the oldest *Quercus rotundifolia* stands in the High Atlas and *Juniperus thurifera*. Along the valleys, irrigated agriculture is practised and most of the park is used for extensive livestock-grazing.

Birds

See Box and Table 2 for key species. More than 95 breeding species have been recorded, among them nine species of the Mediterranean North Africa biome. Thirteen raptors are recorded, among them *Gypaetus barbatus*, which definitely bred in the park until 1980. The Parc National de Toubkal is one of only two areas in Morocco where *Apus caffer* has been recorded breeding, and also holds several species with quite localized distributions in Africa, such as *Rhodopechys sanguinea* and *Eremophila alpestris*.

Key species

A3 (A01) Mediterranean North Africa biome: Nine of the 16 species of this biome that occur in Morocco have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

Until the 1960s the large carnivore *Panthera pardus panthera* (CR) survived here, but it is now considered extinct. There is an increasing population of the ungulate *Ammotragus lervia* (VU)—up from a few dozen individuals in the 1960s to 400 in 1996—and troops of the primate *Macaca sylvanus* (VU) occur. The gazelle *Gazella cuvieri* (EN) is being reintroduced in an enclosure. Seven endemic reptiles are present: *Quedenfeldtia trachyblepharus*, *Lacerta andreanskyi*, *Psammadromus microdactylus*, *Chalcides montanus*, *C. polyepsis*, *Ophisaurus koellikeri*

and *Vipera monticola*. The Parc National de Toubkal is also rich in endemic plants; indeed, of the 145 endemic Moroccan plant taxa, 24 have only ever been recorded from the park. Levels of plant endemism increase at higher altitudes: for example, of the 19 plant species found above 3,800–3,900 m, 15 are endemic.

Conservation issues

The National Park was created by 'Arrête viziriel' on 19 January 1942. Despite its protected status, the park has been facing growing pressures since the 1960s. Poaching has wiped out some species and overgrazing has destroyed or degraded much of the natural vegetation. Tourism has mushroomed and led to erosion of footpaths—on some days 30–40 tourists may be found together at one time on the summit of Jbel Toubkal, in spite of the long and arduous trek required to reach it.

To counter these threats and safeguard wildlife, in the 1950s AEFCS created a reserve for *Ammotragus lervia* adjacent to the park, and in 1994 enclosed an area of 1,000 ha for the reintroduction of *Gazella cuvieri*. Both these measures have resulted in the protection of areas of forest habitat which are important for breeding birds. In 1994, a management plan for the park was drawn up under the auspices of AEFCS. Further conservation measures required include the training of local guides; the protection of nest-sites of the rarer bird species, particularly raptors; maintenance of trails to prevent erosion; and the establishment of grazing enclosures to protect endemic plant species.

Further reading

BCEOM-SECA (1995d, e).

Barrage al Mansour Ad-Dhabi

Admin region Ouarzazate
Coordinates 30°56'N 06°46'W
Area c.5,000 ha Altitude c.1,200 m

MA034

 A1, A4i
Unprotected

Site description

The site is located on the southern side of the High Atlas a few kilometres east of the town of Ouarzazate. It consists of a large reservoir formed in 1972 by the construction of a hydroelectric dam on the Oued Drâa, near the confluence of the Oued Dadès and the Oued Ouarzazate. The reservoir is also fed by many small temporary side-streams. Where these enter the lake, the water is relatively shallow and dense vegetation of *Cynodon dactylon*, *Cyperus* spp., *Juncus* spp., *Phragmites australis* and *Tamarix canariensis* occurs. Elsewhere, the water depth drops off sharply, reaching 2–4 m deep only several metres from the rocky shore. Annual precipitation averages 1,500 mm.

Birds

See Box for key species. The site is chiefly notable for its populations of summer visitors, such as *Marmaronetta angustirostris* and *Tadorna ferruginea*, both of which exceed IBA thresholds. A few pairs of *Marmaronetta angustirostris* have bred; *Tadorna ferruginea* breeds regularly, but numbers of pairs are unknown. Wintering populations of waterfowl are small, although some 20 species have been recorded. The most abundant is *Tadorna ferruginea*, with up to 400 individuals noted.

Key species

A1	Breeding (pairs)	Non-breeding
<i>Marmaronetta angustirostris</i>		
A4i		
<i>Marmaronetta angustirostris</i>	Has bred	187 (passage)
<i>Tadorna ferruginea</i>	Breeds	700 (passage), 400 (winter)

Other threatened/endemic wildlife

The toad *Bufo brongersmai*, a Moroccan endemic, occurs.

Conservation issues

The reservoir is a priority 2 SIBE (No. H42). It is public land, administered by AEFCS and the Service des Travaux Publics. Human activities include fishing, livestock-grazing and reed-cutting around the reservoir's shores. The main threat is discharge of wastewater from the town of Ouarzazate into the eastern end of the reservoir, and consequent organic and chemical pollution. Nesting birds are also subject to human disturbance and poaching near the western end of the lake. Recommended measures include the protection of this nesting zone by the restriction of access during the breeding season, perhaps entailing fencing off the area.

Further reading

BCEOM-SECA (1995b).

Tamri and Imsouane

MA035

Admin region Agadir

Coordinates 30°45'N 09°50'W

A1, A3 (A01), A4i

Area c.4,800 ha Altitude 0–337 m Hunting Reserve, Unprotected

Site description

The site is a 32-km stretch of Morocco's Atlantic coast between Essaouira and Agadir. Varying between 1 and 4 km in width, the site comprises the coastal strip, starting from the forestry post at Idbene Sag in the north, and incorporating the seaward side of the minor road to Imsouane port. From Imsouane, the boundary follows the ridge Talaf Brahim ou Lahsene to just north of Tildi, where it cuts east along the northern cliffs of Oued Tannkourim to the village of Assaka. From Assaka the boundary follows the main Agadir–Essaouira road (RP 8), until it cuts inland at Imzi, via the villages of Timassinine and Id er Rais to Tamri. From Tamri the boundary continues west along the main road to Ait Ali where it cuts south to the Iggui Ouferni ridge to Ouroumi and finally crosses the road to the sea at Cap Ghir. Habitats include coastal cliffs up to 50 m high, the permanent watercourse and estuary of the Oued Tamri, sandy beaches and dunes, and a band of coastal steppe/unintensively used agricultural land between the coast and the foothills of the High Atlas.

Birds

See Box and Table 2 for key species. Tamri is one of only four known Moroccan breeding colonies of *Geronticus eremita*. The other three colonies are located over 50 km south in the Parc National de Souss-Massa (site MA038). All the pairs in the Tamri colony nest on ledges on a single cliff. In 2000, Tamri contained 30 breeding pairs, or 48% of the country's and world population. The ibis use the steppe and fallow fields between Tamri and Cap Ghir and the steppe at Imsouane as feeding areas; there are also several other cliff roost-sites within this area which are used by the birds outside the breeding season. The Tamri and Souss-Massa populations do show some interchange outside the breeding season and so the remaining ibis may be regarded as a single population. Both *Phalacrocorax aristotelis riggenbachi*, a subspecies restricted to Morocco, and *Apus unicolor*, a restricted-range species (of the Madeira and Canary Islands Endemic Bird Area, EBA 120) which only occasionally breeds in Morocco, nest. A pair of *Aquila chrysaetos* have bred on the cliffs west of Assaka. Two species of the Sahara–Sindian biome occur (see Table 2).

Key species

A1	<i>Geronticus eremita</i>		
A3 (A01)	Mediterranean North Africa biome: Seven of the 16 species of this biome that occur in Morocco have been recorded at this site; see Table 2.		
A4i	<i>Geronticus eremita</i>	Breeding (pairs)	Non-breeding
		60+	—

Other threatened/endemic wildlife

The site holds 17 species of amphibians and reptiles, including four Moroccan endemics, among them the reptiles *Acanthodactylus busacki*, *Quedenfeldtia moerens* and *Chalcides manueli*.

Conservation issues

Much of the site is unprotected, but 900 ha of the Embouchure de l'Oued Tamri have been retained as a priority 1 SIBE (No. L27) and a permanent no-hunting zone has been established around Tamri to protect the ibis colony. The colony itself has been the subject of a long-term study by the authorities of the Parc National de Souss–Massa and the RSPB since 1994, and local wardens have been trained and put in place since 1996 to restrict public access and collect detailed observations. The principal threats to the site are the development of a fishing port at Imsouane and the general growth of leisure tourism in the region (construction of hotels, increased levels of disturbance, etc.). The beaches are popular with local residents of Agadir at the weekends, and there are several large camping sites along the coast. Ibis feeding in the fields and steppes are often disturbed by tourists and stone-throwing children. There have also been recent incidents of poaching by irresponsible hunters. Disturbance by birdwatchers at the breeding site is controlled by wardening, but does remain a problem. Protective and educational measures are urgently required, and controlled ecotourism could play an important role in

safeguarding the ibis in the long term. The SIBE requires extending to include some of the most important ibis feeding and breeding areas, and the whole IBA merits official designation as a conservation area.

Further reading

BCEOM-SECA (1995c), Bowden and Smith (1997), Bowden (1998).

Tarhazoute

MA036

Admin region Agadir

Coordinates 30°35'N 09°45'W

A1, A4i

Area c.4,500 ha Altitude 0–478 m

Unprotected

Site description

The site consists of a 21-km stretch of coastline between the small village of Tiguert, 5 km east of Cap Ghir, and the mouth of the Oued Tamraght at Aourir, north of the large resort town of Agadir. Its inland extent varies from 100 m to 6 km. Habitats include coastal cliffs, several sandy beaches and dunes, *Retama* steppe and cultivated fields, and *Argania spinosa* and *Euphorbia* woodland.

Birds

See Box for key species. The site is classed as an IBA because the steppe and fallow fields, particularly those at Tamraght, are regularly used as a feeding area by *Geronticus eremita* outside the breeding season. There is also an important roost on the cliffs, which occasionally holds up to 50 birds. Nine species of the Mediterranean North Africa biome also occur (Table 2).

Key species

A1	<i>Geronticus eremita</i>		
A4i	<i>Geronticus eremita</i>	Breeding (pairs)	Non-breeding
		—	50

Other threatened/endemic wildlife

The endemic toad *Bufo brongersmai* and endemic lizard *Chalcides mionecton* both occur.

Conservation issues

The site currently has no protection and parts of it are designated for development. It does, however, include both sections of the 4,000-ha Cap Ghir SIBE (No. L28, priority 2), which were declared on the basis of their fine coastal stands of *Argania Euphorbia*. The area is under increasing pressure from tourism, and is subject to much the same types of, but more extreme, threats as Tamri and Imsouane (site MA035). The beaches are popular with local residents of Agadir at the weekends, and there are several large camping sites along the coast. Ibis feeding in the fields and steppes are often disturbed by tourists and stone-throwing children. Protective and educational measures are urgently required.

Further reading

BCEOM-SECA (1995c), Bowden and Smith (1997).

Oued Mird

MA037

Admin region Ouarzazate

Coordinates 30°12'N 05°18'W

A3 (A02)

Area 60,000 ha Altitude 650–1,170 m

Unprotected

Site description

Situated 20 km east of Zagora, the site consists of some 40 km of the valley of the Oued Mird and its bordering escarpments and hamada plateaus including, to the south-east, the 15 km by 7 km extinct volcanic crater of Tafenna. The vegetation includes good stands of *Acacia raddiana*; other species include *Ziziphus lotus*, *Convolvulus trabutianus*, *Launaea arborescens*, *Foleyola billotii*, *Hamada scoparia*, *Panicum tugidum* and *Stipagrostis pungens*. Annual rainfall is less than 200 mm. Principal human activities are cultivation, in irrigated fields along Oued Mird, and extensive livestock-rearing, particularly of goats.

Birds

See Box and Table 2 for key species. The site possesses breeding populations of 14 of the 15 species of the Sahara–Sindian biome in

Morocco; only *Hirundo obsoleta* has not been recorded. *Chlamydotis undulata* is present in low numbers, but is in danger of extinction.

Key species

A3 (A02) Sahara–Sindian biome: 14 of the 15 species of this biome that occur in Morocco have been recorded at this site; see Table 2.

Other threatened/endemic wildlife

The ungulate *Gazella dorcas* (LR/nt) is present, and it is suspected that the endemic toad *Bufo brongersmai* and the endemic lizard *Tarentola boehmi* may also occur.

Conservation issues

The site is a priority 1 SIBE (No. 72). Although it is officially unprotected, local residents enforce their own rules and fines for illegal wood-cutting and have banned foreign hunting parties from entering the valley. The main conservation issue is the growing use of motor-pumps, which threatens to lower the water-table and negatively affect trees along the Oued Mird. Ecotourism plans have been proposed for the Tafenna crater, including its use as a possible reintroduction site for native ungulates.

Further reading

BCEOM–SECA (1995b).

Parc National de Souss–Massa and Aglou

MA038

Admin region Agadir, Tiznit

Coordinates 30°05'N 09°40'W

A1, A3 (A01), A4i

Area c.63,800 ha Altitude 0–175 m National Park, Unprotected

Site description

The 33,800 ha Parc National de Souss–Massa was created in 1991. Lying between Agadir to the north and Sidi Ifni to the south, this Atlantic coastal site includes a variety of habitats, ranging from *Argania spinosa* woodland, cultivated fields, *Retama* and *Euphorbia* steppe, to dunes, cliffs, sandy beaches and wetlands. It encompasses the estuaries of the Oued Souss (the northern limit of the park) and Oued Massa. A region of c.30,000 ha near Aglou, south of the park, is also included in the site because it is used periodically as a feeding area by *Geronticus eremita* (see below). This area comprises sheep-grazed littoral steppe approximately 1–2 km wide between the foothills of the Anti-Atlas and the sea. The soils are mainly sandy, with some rocky and stony patches, and most of the area consists of small, intermittently cultivated fields. There is a considerable settled human population in and around the park and Aglou; activities include agriculture, livestock-rearing, fishing (both commercial and leisure) and tourism.

Birds

See Box and Table 2 for key species. Over 100 species have been recorded from the Parc National de Souss–Massa. The overwhelming importance of the site is due to it harbouring three of the four known Moroccan breeding colonies of *Geronticus eremita*. The colonies are located on coastal cliffs within the National Park and numbered 33 breeding pairs in 2000, or 52% of the Moroccan and world population. There are several roost-sites, and most of the coastal steppes and fallow fields are used as feeding areas at some time of the year. Indeed, the coastal belt to the south of the park has been included because it is also used by the birds as a feeding area—albeit less frequently and generally outside the breeding season. Small numbers of the globally threatened *Marmaronetta angustirostris* also breed on Oued Massa—70 were recorded in May 1999. Of the 13 species of the Mediterranean North Africa biome that occur, nine breed and two are regular visitors (*Falco eleonorae* and *Sylvia cantillans*—the latter on migration), while *Eremophila bilopha* is occasional and *Rhamphocoris clotbey* has been recorded once. In addition, *Sylvia deserticola* may occur. Five species of the Sahara–Sindian biome have also been recorded (Table 2). The site is the only known Moroccan breeding site for *Plegadis falcinellus* (12–14 pairs, and up to 65 birds recorded). The Parc National de Souss Massa plays host to numerous migrant birds, both on passage and during the winter. The two most important areas for migrants, primarily waders and gulls, are the estuaries of the Oued Souss and Oued Massa. *Larus audouinii* (wintering) and *Platalea leucorodia* have reached IBA

numerical thresholds on occasion. Up to several hundred *Phoenicopiterus ruber* are regularly found on passage at Oued Souss and are an attraction to tourists from the nearby resort of Agadir.

Key species

A1	<i>Geronticus eremita</i>	<i>Larus audouinii</i>
	<i>Marmaronetta angustirostris</i>	
A3 (A01)	Mediterranean North Africa biome: 13 of the 16 species of this biome that occur in Morocco have been recorded at this site; see Table 2.	
A4i	Breeding (pairs)	Non-breeding
	<i>Platalea leucorodia</i>	160+
	<i>Marmaronetta angustirostris</i>	350

Other threatened/endemic wildlife

Captive-breeding programmes for the ungulates *Oryx dammah* (CR), *Addax nasomaculatus* (EN), *Gazella dama* (EN) and *Gazella dorcas* (LR/nt) are under way in large enclosures within the park. *Struthio camelus* is also being reared. Releases are planned in other protected areas in more arid zones further to the south, but would not be feasible in the immediate area.

Conservation issues

The Parc National de Souss–Massa is a priority 1 SIBE (No. L29). It benefits from effective administration and management by AEFCS, but is threatened by the increasing pressures of the growing human population and activities both within and outside its boundaries. A large-scale hotel development planned for the coast at Tifnit, that includes important feeding areas of *Geronticus eremita*, has apparently been suspended for the moment, but remains a real threat. However, in the unprotected region of Aglou the construction of summer chalets is increasing, spreading south from Sidi Moussa and Aglou. Visitor facilities (nature trail at Oued Souss, visitor centre at Oued Massa) have been constructed to cater for the growing number of tourists. The population of *Geronticus eremita* has been the subject of a long-term monitoring programme by the park authorities and RSPB/BirdLife International, and the colonies are warded during the breeding season. Despite an unexplained mortality incident in May 1996, this population has remained approximately stable for over 20 years. A management plan aimed at the rehabilitation and sustainable management of the park's ecosystems and habitats is being implemented, and the protection and conservation of *Geronticus eremita* occupies a high priority among its management objectives.

Further reading

AEFCS/GTZ (1995), BCEOM-SECA (1995c), Bowden and Smith (1997), Bowden (1998), Touti *et al.* (1999).

Plage Blanche–Ras Takoumba

MA039

Admin region Guelmim

Coordinates 28°53'N 10°45'W

A1, A4i

Area c.20,000–30,000 ha Altitude 0–200 m

Unprotected

Site description

The site consists of a 40-km-long fine-sand beach and associated sand-dunes, stretching from Ras Takoumba in the north to Aoreora in the south, including the estuary of the Oued Boussafene. Along the 15 km of coastline between Ras Takoumba and Oued Boussafene, the coastal sand-dunes are low, and are separated from the inland edge of the coastal plateau by a shallow depression 400–500 m wide, which can be temporarily inundated with fresh water in wet years, forming an attractive habitat for migrating waterfowl. The 25-km stretch of coastline between Oued Boussafene and Aoreora (the section of coast usually referred to as 'Plage Blanche') is backed by fields of higher, stable dunes, which reach their greatest width, 9 km, at the southern end of the site. Vegetation consists of dunal vegetation, halophytic scrub with *Euphorbia echinus*, *E. regis-jubae*, *E. balsamifera*, *Lycium intricatum* and *Tamarix gallica* along watercourses.

Birds

See Box for key species. *Calidris alba* is present at high densities along much of the beach during the winter, while *Marmaronetta angustirostris* may frequent the temporary wetland between Oued Boussafene and Ras Takoumba. *Larus fuscus* approaches IBA thresholds.

Key species			
A1	<i>Marmaronetta angustirostris</i>		
A4i		Breeding (pairs)	Non-breeding
	<i>Marmaronetta angustirostris</i>	—	550
	<i>Calidris alba</i>	—	1,500

Other threatened/endemic wildlife

Fifteen species of reptile, including four Moroccan endemics, and one endemic amphibian, *Bufo brongersmai*, are known from the site.

Conservation issues

The site is currently unprotected and is a priority 3 SIBE (no. L31). The principal threats are disturbance from fishermen and tourists who frequently drive along the beach; overgrazing, mainly between Ras Takoumba and Boussafene; and unregulated development of roads, tracks, settlement and tourist infrastructure. An integrated management plan to control these threats is required.

Further reading

BCEOM-SECA (1995c), Qninba *et al.* (1997).

Msseyed		MA040	
Admin region Tan Tan			
Coordinates 28°15'N 10°15'W		A1, A3 (A01, A02), A4i	
Area c.180,000 ha Altitude 103–823 m		Unprotected	

Site description

This is a large site located 70 km west of Tan Tan. It comprises the rocky mountains of Jbel Bani, Jbel Rich, Jbel Tazzout and Jbel Ouarkiz, separated from each other by silty valleys including, between Jbel Rich and Jbel Tazzout, the bed of the Oued Drâa. The climate of the north-western 10% of the site is subject to an oceanic influence and is consequently wetter and more densely vegetated with *Argania spinosa* and *Euphorbia echinus*, while the larger south-eastern sector is drier and supports a Saharan-type vegetation with bushes of *Limoniastrum ifniense* and *Nitraria retusa*, together with the most extensive and well-developed stands of *Acacia raddiana* in the country. The many permanent brackish gueltas along the valleys are fringed with *Tamarix* spp., and there are several freshwater springs. Annual precipitation is around 40 mm.

Birds

See Box and Table 2 for key species. In the mid-1990s a limited survey investigating a small part of the site recorded 20 *Marmaronetta angustirostris* and 100 *Tadorna ferruginea*, and it can therefore be assumed that total numbers of both species exceed IBA thresholds. A total of 35 species is known to breed. *Argania/Euphorbia* woodland in the north-west sector supports a Mediterranean avifauna, while the south-western portion of the site contains a representative sample of the Saharan species.

Key species			
A1	<i>Marmaronetta angustirostris</i>		
A3 (A01)	Mediterranean North Africa biome: Six of the 16 species of this biome that occur in Morocco have been recorded at this site; see Table 2.		
A3 (A02)	Sahara-Sindian biome: 11 of the 15 species of this biome that occur in Morocco have been recorded at this site; see Table 2.		
A4i		Breeding (pairs)	Non-breeding
	<i>Marmaronetta angustirostris</i>	—	30+
	<i>Tadorna ferruginea</i>	—	225+

Other threatened/endemic wildlife

The mammals *Gazella dorcas* (LR/nt), *Gazella cuvieri* (EN), *Ammotragus lervia* (VU) and *Acinonyx jubatus hecki* (EN) are all present (tracks of the latter seen in 1994). Three endemic reptiles, *Tarentola boehmi*, *Quedenfeldtia moerens* and *Acanthodactylus busacki*, occur, as does the endemic amphibian *Bufo brongersmai*.

Conservation issues

The site is currently unprotected, but was classed as a priority 1 SIBE (No. 77) because of the beauty of the landscape and outstanding large-mammal and reptile communities: indeed, reintroduction programmes for *Oryx dammah* (CR) and *Gazella dama* (EN) have been proposed.

However, since 1995 the site has been considered a hunting reserve for Middle Eastern Arab visitors. Human activities include nomadic pastoralism (goats, sheep and camels) and irrigated cultivation along the valleys (date-palms, barley, etc.). Threats include hunting of gazelle from vehicles by urban visitors; hunting by visiting Arab falconers, who in 1995 killed hundreds of *Chlamydotis undulata*; and poisoning campaigns against predators which have killed non-target scavengers such as vultures. The creation of a National Park and implementation of a sound management plan are urgently required.

Further reading

BCEOM-SECA (1995b).

Oued Amma Fatma		MA041	
Admin region Laayoune			
Coordinates 28°13'N 11°46'W		A1, A4i	
Area c.300 ha Altitude 0–140 m		Unprotected	

Site description

The site comprises the estuary and lower 4 km of a Saharan wadi, the Oued Amma Fatma, which cuts through the surrounding hamada plateau to form a steep-sided valley approximately 600–800 m wide. The wadi is partially blocked near its outlet by a road bridge and dyke which have resulted in the formation of a small freshwater basin and marsh. The banks of the estuary and the sheltered cove between the coastal cliffs are sandy. Vegetation consists of arid scrubland and some aquatic marsh.

Birds

See Box for key species. The sandbanks of the estuary and beach provide a roosting site for *Larus audouinii* and other gull and wader species.

Key species			
A1	<i>Larus audouinii</i>		
A4i		Breeding (pairs)	Non-breeding
	<i>Larus audouinii</i>	—	420

Other threatened/endemic wildlife

None known to BirdLife International

Conservation issues

The site is unprotected, but is a priority 3 SIBE (No. L34). Local commercial fishermen and tourists use the beach and cliffs as camping and fishing sites and may disturb roosting and feeding birds. Effective control of these activities is required.

Further reading

BCEOM-SECA (1995c), Qninba *et al.* (1997).

Lagune de Khnifiss		MA042	
Admin region Laayoune			
Coordinates 28°02'N 12°16'W		A1, A4i, A4iii	
Area 20,000 ha		Permanent Biological Reserve,	
Altitude 0–50 m		Ramsar Site	

Site description

The Lagune de Khnifiss is located on the Atlantic coast between Tarfaya and Tan Tan Plage in the south of the country. It is a long, narrow inlet, several hundred metres wide and extending for 20 km, lying roughly parallel to the coast, but separated from it to the west by a line of dunes. To the east it is bounded by a row of sandstone cliffs c.50 m high, formed from ancient consolidated dunes. The lagoon is open to the sea at its mouth, known as Foum Agoutir, and is therefore tidal. At its furthest extent inland it opens out into a large saltpan, Sebkhatazra, which is only flooded during the highest tides. The lagoon vegetation consists of saltmarsh and seagrasses while the bordering cliffs support low shrubs of semi-desert. The most important habitats for birds are the mudflats and sandbanks exposed at low tide.

Birds

See Box for key species. The Lagune de Khnifiss is a vital stop-over site

on the Atlantic coastal flyway for migrating Palearctic waders, waterfowl and seabirds, and is considered to be the third most important wintering site for waders in Morocco, after Merja Zerga (site MA010) and the Baie d'Ad-Dakhla (site MA045). It regularly holds more than 20,000 waders, including up to 14,000 *Calidris alpina*. Seven species are known to exceed IBA threshold levels, including (probably) *Larus audouinii* (CD). In total more than 170 species have been recorded, of which almost one third breed. The most notable breeding species are *Tadorna ferruginea*, *Phalacrocorax aristotelis*, *P. carbo*, *Larus genei* and *Sterna hirundo*; the lagoon is the only known Moroccan breeding site for the last two species.

Key species

A1	<i>Larus audouinii</i>		
A4i		Breeding (pairs)	Non-breeding
	<i>Phoenicopterus ruber</i>	—	1,083
	<i>Platalea leucorodia</i>	—	160
	<i>Tadorna ferruginea</i>	—	300
	<i>Pluvialis squatarola</i>	—	2,092
	<i>Limosa lapponica</i>	—	3,987
	<i>Calidris alba</i>	—	3,800
	<i>Calidris minuta</i>	—	3,760
A4iii	More than 20,000 waterbirds occur regularly at this site.		

Other threatened/endemic wildlife

The site holds two of Morocco's six endemic mammals, *Gerbillus occiduus* and *Crocodyra tarfayaensis*, as well as one endemic amphibian *Bufo brongersmai* and one endemic lizard *Tarentola boehmi*.

Conservation issues

The site is public land. It was designated as a Réserve Naturelle by ministerial decree on 3/11/1962 and reclassified as a Réserve Biologique Permanente, again by ministerial decree, on 3/06/1983. It was nominated a Ramsar Site in 1980, and was classed as a priority 1 coastal SIBE (No. L36), to which the limits of the IBA correspond. Human activities include fishing, salt-harvesting and ecotourism. Near Foum Agouitir there is a permanently manned civil-guard post which confers a degree of protection on the site. The main potential threat is the proposed exploitation of oil-bearing shales in the region. The effective implementation of a proper management plan is urgently required.

Further reading

BCEOM-SECA (1995c), Auteurs multiples (1988), Dakki and de Ligny (1988).

Zone Humide de Laayoune

Admin region Laayoune

Coordinates 27°10'N 13°11'W

Area c.600 ha Altitude 30–60 m

MA043

A4i

Unprotected

Site description

Located along the course of the Oued Saquia Al Hamra, the site is bordered on its southern side by the suburbs of the rapidly growing town of Laayoune. Along much of its course, the oued is dry for most of the year, only holding water after infrequent rainfall. However, about 1 km downstream from Laayoune the oued is blocked by mobile dunes, so that the discharged effluent of the town forms a series of permanent stagnant pools. Vegetation consists of fringing stands of *Tamarix* and *Hypochaeris* spp., with aquatic species *Ruppia* sp. and *Charia mauretanicus*.

Birds

See Box for key species. Six species have been recorded breeding, including *Tadorna ferruginea*, *Ciconia nigra* and *Glareola pratincola*, as well as one species of the Sahara–Sindian biome (see Table 2). The site is chiefly important as a stop-over area for migrating waders and waterfowl, and small numbers of wintering *Marmaronetta angustirostris* have been recorded.

Key species

A4i		Breeding (pairs)	Non-breeding
	<i>Charadrius alexandrinus</i>	—	1,110

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

The site is unprotected. The main measure necessary is conservation education of the surrounding population to reduce undue disturbance to nesting and wintering birds.

Further reading

Qninba *et al.* (1997).

Pointe d'Awfist

Admin region Boujdour

Coordinates 25°35'N 14°41'W

Area c.700–800 ha Altitude 0–50 m

MA044

A1, A4i

Unprotected

Site description

The site comprises a 6-km stretch of sandy coastline with low dunes, located approximately 50 km south of Boujdour in the Moroccan Sahara. The sand and dunes have accreted at the foot of 100-m-high rocky cliffs—which for many kilometres in either direction constitute the normal coastline—to form a barely perceptible point. These cliffs mark the inland boundary of the site, which is around 1 km wide at most. The site is accessible by two tracks descending the cliffs, and is frequented by rod-and-line subsistence fishermen who have constructed several camps. The dunes support sparse, salt-tolerant tussock vegetation.

Birds

The site's ornithological interest lies in the fact that it is the only sandy stretch of coastline for many kilometres north or south, and is therefore used as a roosting site by waders and seabirds, particularly migrant gulls. In winter it is an important roost for *Larus audouinii*. Two January visits recorded 1,680 individuals (in 1993) and 5,500 (in 1997).

Key species

A1	<i>Larus audouinii</i>		
A4i		Breeding (pairs)	Non-breeding
	<i>Larus audouinii</i>	—	5,500

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

The Pointe d'Awfist is currently unprotected, but has been identified as a priority 2 SIBE (No. L37). The principal threats are pollution and disturbance of birds by fishermen, and the main conservation measures required are the restriction of access to the site during the winter months and the removal of the few scattered permanent fishing camps.

Further reading

Beaubrun (1983), BCEOM-SECA (1995c), Qninba *et al.* (1997).

Baie d'Ad Dakhla

Admin region Oued Eddahab

Coordinates 23°42'N 15°51'W

Area 21,200 ha Altitude 0–50 m

MA045

A1, A3 (A02), A4i, A4iii

Unprotected

Site description

A huge coastal bay in the Moroccan Sahara, measuring some 37 km by 14 km, separated to the west from the Atlantic by a low promontory of coastal dunes, but open to the ocean at its southern end. The eastern inland side is bordered by coastal cliffs 50 m or so high. The town of Ad Dakhla is situated on the southernmost tip of the spit, linked to the mainland by a tarmac road which runs around the northern end of the bay. There are several other villages around the edge of the bay. The site consists of three geographically isolated units: a northern sector of 20,000 ha covering the northern part of the bay; a western sector, La Sarga, of 300 ha at the southernmost tip of the spit; and a southern sector, Pescadore, of 900 ha located on the mainland coast opposite and south of La Sarga. The bay is relatively shallow and the sandy/muddy bottom is covered in seagrass *Zostera* and algae. The dunal and coastal habitats are dominated by *Suaeda monodiana*, *Nitraria retusa* and *Zygophyllum waterlotti*. Other plants include *Atriplex* spp., *Lotus* spp., *Salsola longifolia*, *Heliotropium undulatum* and *Lycium intricatum*.

Birds

See Box and Table 2 for key species. The Baie d'Ad Dakhla is an extremely important wintering site for migrant Palearctic waders and gulls. It regularly harbours more than 20,000 waders—predominantly *Calidris alpina*, *Calidris canutus* and *Limosa lapponica*—more than 20,000 gulls, mainly *Larus fuscus* and *Larus audouinii*, and several hundred *Phoenicopiterus ruber* and *Phalacrocorax carbo*. Five of the eight species of the Sahara–Sindian biome (see Table 2) breed in the desert habitats surrounding the bay, while the remaining three are suspected breeders. One species of the Mediterranean North Africa biome has also been recorded (see Table 2).

Key species

A1	<i>Larus audouinii</i>		
A3 (A02)	Sahara–Sindian biome: Eight of the 15 species of this biome that occur in Morocco have been recorded at this site; see Table 2.		
A4i		Breeding (pairs)	Non-breeding
	<i>Phoenicopiterus ruber</i>	—	826
	<i>Charadrius hiaticula</i>	—	3,779
	<i>Charadrius alexandrinus</i>	—	1,288
	<i>Pluvialis squatarola</i>	—	2,030
	<i>Calidris alba</i>	—	2,808
	<i>Calidris canutus</i>	—	8,400
	<i>Calidris alpina</i>	—	22,000+
	<i>Limosa lapponica</i>	—	7,440
	<i>Larus audouinii</i>	—	390+
	<i>Larus fuscus</i>	—	23,638
	<i>Sterna caspia</i>	—	1,121
A4iii	More than 20,000 waterbirds occur regularly at the site.		

Other threatened/endemic wildlife

Three Macaronesian endemic plants, *Polycarpha nivea*, *Teucrium chardonianum* and *Limonium tuberculatum*, plus one Moroccan endemic, *Atriplex glaucum ifniense*, are known from the site. Several threatened marine mammals frequent the bay: *Orcinus orca* (LR/cd), *Sousa teuszii* (DD) and *Tursiops truncatus* (DD).

Conservation issues

The Baie d'Ad Dakhla is public land managed by the Service des Travaux Publics and AEFCS. It is a priority 1 SIBE (No. L39). Activities include sport-fishing, octopus-fishing, fish-farming, tourism and some rearing of camels and goats. The site benefits from some protective legislation: hunting and fishing with nets in the bay are banned and octopus-fishing quotas are set. However, the Baie d'Ad Dakhla is threatened by the growth of the town of Ad Dakhla (and associated increasing levels of pollution), proposed fish-farming projects, the construction of a port in the bay, and a rise in the number of tourists. The site urgently needs the implementation of an integrated management plan.

Further reading

BCEOM-SECA (1995c), Qninba *et al.* (1997), Rufino *et al.* (1998), Valverde (1957).

Parc National de Dakhla

Admin region Oued Eddahab

Coordinates Aguerguer 21°50'N 16°55'W,

Safia 22°30'N 15°00'W

Area 1,500,000–2,000,000 ha

Altitude 0–350 m

MA046

A3 (A02), A4i

Unprotected

Site description

The site is a huge proposed National Park in the former Western Sahara, split into two distinct parts. The coastal sector, called

Aguerguer or the Côte des Phoques, covers a 180-km stretch of coastline from south of Sebkhath Lamhar Touil to the Mauritanian frontier, bordered inland by the road between Dakhla and Lagouira and extending 12 nautical miles out to sea (and thus covering more than 360,000 ha of coastal waters and open sea). An isolated part of the Presqu'île du Cap Blanc, south of the Mauritanian town of Nouadhibou, is also included in this sector. Habitats include high coastal cliffs and caves, and weathered sandstone buttes and ravines. Vegetation includes salt-tolerant coastal species such as *Suaeda* spp., *Atriplex* spp. and *Spartina maritima*.

The much larger inland desert sector, called Safia, lies west of the town of Awsserd. It covers the mountainous massifs of Grarat Ouchfeg in the north and Adrar Souttoug in the south, together with the expanses of flat reg overlaid with barkhan sand-dunes lying between the two massifs. These barkhan dunes are highly mobile and often very tall. Vegetation in the sector is sparse, consisting primarily of the woody species *Acacia raddiana*, *Maerua crassifolia* and *Capparis decidua* with associated scrub, growing along wadi beds and drainage lines. Annual rainfall may be less than 40 mm, and periods of complete drought of several years are not uncommon.

Birds

See Box and Table 2 for key species. A total of 176 species have been recorded from the two sectors of the proposed National Park, including six species of the Mediterranean North Africa biome (see Table 2). Altogether, 38 species are known to breed. The Presqu'île du Cap Blanc is an important migration staging-post for waders and seabirds on their way to and from the Banc d'Arguin in Mauritania. In addition to the four waterbird species known to occur in numbers exceeding IBA thresholds, numbers of *Sterna maxima* have approached the IBA threshold (without exceeding it).

Key species

A3 (A02)	Sahara–Sindian biome: 12 of the 15 species of this biome that occur in Morocco have been recorded at this site; see Table 2.		
A4i		Breeding (pairs)	Non-breeding
	<i>Calidris alba</i>	—	1,200+
	<i>Arenaria interpres</i>	—	700+
	<i>Larus fuscus</i>	—	6,000+
	<i>Sterna sandvicensis</i>	—	2,800+

Other threatened/endemic wildlife

The Aguerguer region is one of the last strongholds of the seal *Monachus monachus* (CR). Fifteen other marine mammals, all whales and dolphins, many of which are globally threatened, have been recorded. A large population of the ungulate *Gazella dorcas* (LR/nt) survives, protected by the difficult terrain. The Safia sector of the park also harbours *Gazella dorcas* (LR/nt) and *Ammotragus lervia* (VU).

Conservation issues

The area is currently unprotected, but merits urgent gazettelement and implementation of an integrated management plan. Development of a National Park will be hampered by the fact that much of the region is still troubled by political insecurity, and the presence of fields of landmines. Other threats include hunting of large mammals and bustards (Otididae) by locals and Middle Eastern hunting parties, and tourist disturbance along the coast. The Safia sector of the park is a potential reintroduction site for captive-bred individuals of the ungulates *Addax nasomaculatus* (CR), *Oryx dammah* (CR) and *Gazella dama* (EN).

Further reading

BCEOM-SECA (1995), de Naurois (1967), Valverde (1957).

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