

SYRIAN ARAB REPUBLIC

INTRODUCTION

Area: 185,180 sq.km.

Population: 12,530,000 (1990).

Syria is situated on the eastern shore of the Mediterranean Sea, and is bordered in the north by Turkey, in the east by Iraq, and in the south by Jordan, Israel and Lebanon. Behind the narrow Mediterranean coastal plain, the Jabal al-Nusayriyah (Jebel elAnsariyah) range rises to about 1,500 m, then drops steeply to the Asi (Orontes) river valley to the east. In the southwest of the country, the Jebel esh Sharqi (Anti-Lebanon) range rises to 2,814 m at Jesh Sheikh (Mount Hermon) on the Lebanese border. The only other major area of highland is the Jabal ad Duruz southeast of Damascus on the Jordanian border. East of these mountain ranges, the land slopes gently northeast towards the Euphrates river valley, which cuts in a northwest-southeast direction across the eastern half of the country. The vast eastern region consists mainly of open steppe and desert, with conditions becoming progressively more arid towards the border with Iraq in the east and southeast.

The climate of the coastal plain is Mediterranean, with hot, dry summers and mild, wet winters. Rainfall increases with altitude in the coastal mountain ranges, and snow is common in winter. In the dry steppe and open desert country east of the mountains, a marked continental climate prevails, with high summer temperatures and relatively cold winters, with many nights of frost. Over most of this region, which covers approximately 60% of the country, the average annual rainfall is less than 250 mm. In spring and autumn, the hot and dusty "khamsin" wind, blowing from the east and southeast, may cause temperatures to rise as high as 43-49°C. Damascus, situated east of the coastal mountain ranges, has a mean annual rainfall of 225 mm and average temperatures ranging from 7°C in January to 27°C in July.

The natural vegetation comprises Mediterranean, Irano-Turanian and Saharo-Sindian elements. However, virtually all natural vegetation has long since been altered and degraded by human activity. The surviving vegetation includes oak maquis on the narrow coastal plain and foothills, remnant coniferous forests on the slopes of the Jabal alNusayriyah and along the Anti-Lebanon range, Irano-Turanian steppe on the central and eastern plains, and subalpine and alpine communities above 2,000 m in the southern mountains. Syria's major landscapes and dominant vegetation types have recently been summarized by IUCN (1992) and Evans (1994).

Agriculture has traditionally been the mainstay of the economy. Much of the agriculture is concentrated in the ancient "Fertile Crescent" which extends in an arc from the inner rim of the coastal mountains, through northern Syria and down the Euphrates Valley into Iraq. The main crops are cotton, wheat, barley, rice, olives, millet, sugar-beet and tobacco. The rearing of livestock, particularly sheep and goats, remains important in the semi-desert areas where irrigation water is scarce. The huge Asad Dam on the Euphrates River, begun in 1968 and finally inaugurated in 1978, has permitted a major expansion in the area of arable land in central Syria, and further dam projects and irrigation schemes, notably on the Yarmuk River, are planned or under way. Syria's industrial sector was traditionally based on the cotton industry, but in recent years phosphate mining and manufacturing have become more important. Since 1974, oil has been Syria's most important source of export revenue. The country is divided into 14 governorates, with Damascus (Dimashq) as the capital.

Summary of Wetland Situation

With its mountainous terrain in the west and arid climate in the east, Syria possesses rather few major natural wetlands other than the Euphrates River itself. Furthermore, most of those wetlands which did exist have been degraded or destroyed by drainage for agriculture and diversion of water supplies for irrigation purposes. There are 180 km of coastline on the Mediterranean, but most of this is rocky with narrow sand beaches. The few offshore islands are small and rocky, the best known being Arwad off Tartus. Numerous permanent streams and rivers flow down from the coastal ranges onto the narrow coastal plain, but virtually all of the former wetlands in this area have been drained for agriculture, except perhaps at Buhayrat al-Laha near the Lebanese border in the south.

Until the late 1960s, there was a large area of small lakes and permanent marshes along the meandering course of the Asi (Orontes) River in the Al-Ghab depression at the eastern foot of the Jabal al-Nusayriyah. The Ministry of Agriculture and Agrarian Reform proposed a part of this area, Ghab Lake, as a site for conservation under Project AQUA (Luther & Rzoska, 1971). However, all of the wetlands in this area were drained between 1954 and 1968 and replaced with irrigated cultivation, livestock farms and fish-farms. Permanent wetlands in this area are now confined to irrigation and drainage channels with small patches of *Phragmites*, although some winter flooding may still occur in places. The Asi River itself is heavily utilized for irrigation purposes, and now almost runs dry in summer.

Further east, there are several shallow basins fed by winter rains which tend to dry out in summer or turn into disconnected salt lakes. The most important of these, Sabkhat al Jabbul, is a large shallow salt lake near Halab (Aleppo), renowned for its Greater Flamingos *Phoenicopterus ruber*. Recent changes in the hydrology of the lake have resulted in a lowering of the salinity and colonization by aquatic vegetation. Other notable salt lakes include Sabkhat Muh near Tadmur (Palmyra), and

a group of small lakes in the Jabal Sis area in the south.

The River Euphrates (Al-Furat) flows for some 420 km through Syrian territory and is joined by two important tributaries, the Balikh and Khabur rivers, which enter it from the northeast. Although large areas of former floodplain wetland have been converted to agricultural land, islands in the river continue to support remnants of the native riverine woodland, while oxbow lakes, quiet backwaters and riverine marshes remain important for migratory waterfowl. In the extreme northeast of the country, a series of large springs formerly supplied water to a number of small lakes and marshes which eventually drained into the Khabur, Balikh and Jaghjagha rivers. Most of these wetlands have been drained for agriculture or had their water supplies taken for irrigation, but at least one lake, Buhayrat al-Khatuniyah, remains, although now much reduced in size. Vast areas of natural steppe in this region of Syria have now been converted to intensive irrigated cultivation.

The loss of natural wetlands in Syria has to some extent been compensated for by the creation of a number of large water storage reservoirs, some of which have become important for migratory waterfowl. A large section of the Euphrates Valley was dammed and flooded in the 1970s, creating Buhayrat al-Asad (Lake Asad). This huge reservoir, covering over 63,000 ha and much the largest water body in the country, now supports very large numbers of waterfowl in winter. However, with the greatly increased availability of water for irrigation, more and more of the arid eastern region is being brought under cultivation, leading to a dramatic decline in the area of natural steppe and massive consequences for the environment as a whole. Other important man-made lakes include Baath Lake, behind a dam on the Euphrates River downstream from Lake Asad, and Bahrat Homs (Lake Qattine), created by a barrage on the Asi River dating from Roman times. Bahrat Homs is particularly important as a wintering area for the White-headed Duck *Oxyura leucocephala*. Smaller reservoirs, such as Al-Rastan and Maharda on the Asi River and Al-Shahba on the Quin River, may support substantial numbers of waterfowl during the migration seasons and in winter.

A recent inventory of Important Bird Areas in the Middle East, sponsored by BirdLife International, has identified 22 sites as being of special importance for bird conservation in Syria (Evans, 1994). Six of these sites are wetlands and a further ten contain significant tracts of wetland habitat. It was believed that all of the permanent and seasonal wetlands that are most important for waterbirds had been included in the inventory, but it was acknowledged that coverage of coastal habitats was inadequate. Twelve of the wetland areas described in Evans (1994) are included in the present inventory. The others have been excluded either because they are of only local, rather than international, significance, or because they have already been degraded or destroyed.

Wetland Research

Very little research has been carried out on the wetlands of Syria. The Ministry of Agriculture and Agrarian Reform conducted a preliminary survey of Syria's wetlands in the late 1960s for Project AQUA, part of the International Biological Programme (Luther & Rzoska, 1971). Four sites were nominated by the Ministry of Agriculture for conservation under this project. The Department of Zoology at the University of Damascus has undertaken surveys to identify important nature conservation areas, and in particular worked with the UNEP Specially Protected Areas Task Force in a coastal resources survey in 1989 to identify possible marine and coastal protected areas (Jeudy de Grissac, 1989). The International Waterfowl and Wetlands Research Bureau (IWRB) sponsored waterfowl counts at a total of seven wetlands in December 1971 and December 1972 (Dijksen & Koning, 1972; Koning & Dijksen, 1973). Macfarlane (1978) investigated the birdlife of Bahrat Homs (Lake Qattine) in 1976 and 1977, and Bottema (1985) visited Waz Gol in the northeast in 1982. Biologists from the Faculty of Agriculture at the University of Aleppo have participated in the International Waterfowl Census, organized by IWRB, since 1993, and carried out mid-winter waterfowl counts at nine wetlands in January 1993 and January 1994.

Wetland Area Legislation

Current nature conservation legislation, which concerns forest protection, protection of aquatic life, hunting and general care of the environment, has been summarized by IUCN (1992). The Law on the Protection of Aquatic Life (Legislative Decree No.30 of August 1964) includes articles which cover the protection of public waters and the regulation of fishing in sea water extending 12 miles from the coast. The Law on Hunting (Legislative Decree No.152 of July 1970) contains various acts including designation of the Hunting Council and areas where hunting is restricted. In Legislative Decree No.50 of April 1979, all hunting was banned for a period of five years as a measure to preserve wildlife (IUCN, 1992). The Ministry of State for Environmental Affairs is currently drafting a nature conservation law (Evans, 1994).

At international level, Syria is a contracting party to the World Heritage Convention, but has not as yet designated any natural World Heritage Sites. It has also ratified the Convention for the Protection of the Mediterranean Sea against Pollution (the Barcelona Convention), and has adopted the Protocol Concerning Mediterranean Specially Protected Areas. Designation of seven Mediterranean Specially Protected Areas in accordance with this Protocol is currently under consideration by the Government. Syria participates in the UNESCO Man and the Biosphere Programme and has created a National Committee, but has not as yet established any Biosphere Reserves. It is not, however, a party to either the Ramsar Convention or the Bonn Convention, nor has it signed the Biodiversity Convention.

Wetland Area Administration

The main governmental body concerned with the environment is the Ministry of Agriculture and Agrarian Reform, established in 1967. The Ministry is responsible for agriculture, water pollution, hunting, fishing and management of protected areas. The Fisheries Office within this ministry is concerned with inland waters and marine matters (IUCN, 1992). There is a system of protected forests and rangelands which includes Enclosed Rangeland Reserves administered by the Directorate of Rangeland and Countryside in the Ministry of Agriculture and Agrarian Reform, and State Forest Protection Zones, administered by the Directorate of Forests and Afforestation in the same ministry, but only a few of these have been established to date, and none includes any significant wetlands.

The Ministry of State for Environmental Affairs in the Prime Ministry is primarily concerned with the impact of air, water, chemical and noise pollution, although it has interests in fauna, forest vegetation, coastal areas, deserts, proposed wildlife areas, botanical gardens and zoos. It undertakes research on the future establishment of protected areas, preservation of individual species and environmental legislation. The Ministry of Public Works and Water Resources has interests in water conservation and the construction of dams, and has responsibility for the control of water pollution and in the drafting of legislation for the control of water pollution. The Ministry of Local Administration implements projects including the drainage and reclamation of swamps and pools. There is also a Ministry of the Euphrates Dam with its own special funds (IUCN, 1992).

Organizations involved with Wetlands

Ministry of Agriculture and Agrarian Reform

Fisheries Office, Directorate of Forests and Afforestation, and Directorate of Rangeland and Countryside

Ministry of State for Environmental Affairs

General Commission for Environmental Affairs

Ministry of Public Works and Water Resources

Ministry of Local Administration

Ministry of the Euphrates Dam

Ministry of Higher Education

Directorate of Scientific Research

Faculty of Sciences, University of Damascus

Department of Botany and Department of Zoology

Faculty of Agriculture and Forestry, University of Aleppo

Department of Animal Production

Syrian Biologists' Society

A non-governmental organization based at the University of Damascus.

WETLANDS

Site descriptions compiled from the literature, principally Evans (1994), and material submitted for the International Waterfowl Census by Dr Ibrahim Hanna and colleagues at the Faculty of Agriculture, University of Aleppo.

Wetland Name: Wadi al-Radd

Country: Syrian Arab Republic

Coordinates: 36°35'N, 41°30'E

Location: near the Iraqi border, 60 km south-southeast of AlQamishli, Al-Hasakah Governorate.

Area: Area of wetlands unknown; entire region 48,000 ha.

Altitude: c.400 m.

Overview: A steppic basin subject to winter flooding in the extreme northeast of Syria, now largely converted to agricultural land; formerly (and perhaps still) of importance as a staging and wintering area for migratory waterfowl.

Physical and ecological features: A steppic basin, some 60 km long by 10 km wide, in the Jazirah region of northeastern Syria, formerly subject to extensive winter flooding. Numerous small seasonal streams descending from Jabal Sinjar in Iraq and from the Turkish mountains to the north caused flooding in winter and spring, the extent depending on the season's rain and snowfall. The basin drains west into a tributary of the Khabur River which eventually joins the Euphrates. By December 1971, the entire basin had been converted into intensive cultivation (wheat and cotton), and there was no standing water apparent in that year. No information is available on the present status of this area, but it is thought that parts of the original area are still liable to winter flooding in years of good rainfall, and are then likely to be important for passage and wintering waterfowl.

Land tenure: No information.

Conservation measures taken: None. The site has been identified as an Important Bird Area by BirdLife International (Evans, 1994).

Conservation measures proposed: None known.

Land use: Most of the area is under cultivation for wheat and cotton.

Possible changes in land use: Any surviving natural wetland is likely to be drained and converted into agricultural land.

Disturbances and threats: Wetland drainage and the large-scale conversion of steppe into agricultural land have destroyed most of the natural vegetation. Hunting is apparently widespread and uncontrolled.

Hydrological and biophysical values: No information.

Social and cultural values: No information.

Noteworthy fauna: The basin is known to have attracted large numbers of ducks during the migration seasons, and may have been an important wintering area for waterfowl (Savage 1968). However, Dijksen and Koning (1972) found little wetland remaining in December 1971 and only small numbers of ducks *Anas* spp. Greater Flamingos *Phoenicopterus ruber* have been recorded in the basin in the last few years, indicating that relatively deep and prolonged flooding may still

occur. No other information is available on the fauna.

Noteworthy flora: No information.

Scientific research and facilities: Mid-winter waterfowl counts were undertaken by an IWRB mission in December 1971 (Dijksen & Koning, 1972).

Management authority and jurisdiction: No information.

References: Dijksen & Komng (1972); Evans (1994); Savage (1968).

Reasons for inclusion: 3b. Possibly still an important staging and wintering area for migratory waterfowl, but poorly known.

Source: See references.

Wetland Name: Buhayrat al-Khatuniyah

Country: Syrian Arab Republic

Coordinates: 36°24'N, 41°14'E

Location: 6 km from the Iraqi border, 45 km east-southeast of AlHasakah, Al-Hasakah Governorate.

Area: 800 ha (formerly 1,200 ha).

Altitude: 452 m.

Overview: A small freshwater lake in a region of semi-desertic steppe, now much reduced in size and surrounded by cultivation, but probably still important for migratory waterfowl.

Physical and ecological features: Buhayrat al-Khatuniyah (also known as Khatounia Lake, Bahrat Hatuniya or Buhayrat al-Hul) is a natural, mesotrophic, spring-fed lake of about 800 ha, surrounded by "clay" desert between the small settlements of Khatuniyah and Al-Hul. Luther and Rzoska (1971) give the area of the lake as 1,200 ha and the mean depth as 8 m; it drains west into a tributary of the Khabur River which eventually joins the Euphrates. The lake is apparently now much reduced in size, and has been partly converted into fish-ponds. The vegetation includes *Tamarix articulata*, *Poa bulbosa* and *Aleuropus littoralis*.

Land tenure: State owned.

Conservation measures taken: None. The lake has been included in a much larger site (80,000 ha) identified as an Important Bird Area by BirdLife International (Evans, 1994). Conservation measures proposed: Khatounia Lake was proposed as a site for conservation under Project AQUA by the Ministry of Agriculture and Agrarian Reform in the late 1960s (Luther & Rzoska, 1971).

Land use: The lake is used for fishing, hunting and recreation. Shoreline vegetation is grazed by domestic livestock, and surrounding areas are under cultivation.

Possible changes in land use: No information.

Disturbances and threats: Parts of the lake have been converted into fish-ponds, and very large areas of the surrounding steppe have been converted into agricultural land. Waterfowl hunting is widespread and uncontrolled. Over-fishing is also reported to be a problem in the lake, and the surrounding area is heavily grazed by feral donkeys. *Tilapia* fish have been introduced into the lake.

Hydrological and biophysical values: No information.

Social and cultural values: No information.

Noteworthy fauna: Small numbers of geese and ducks are present in winter, e.g.

200 *Anser anser* and 200 *Anas* sp. were recorded in January 1994. The Houbara Bustard *Chiamydotis undulata* is reported to be a resident in the surrounding semi-desert, and Pintailed Sandgrouse *Pterocles aichata* is common. Mammals said to occur in the area include Wolf *Canis lupus*, Red Fox *Vulpes vulpes*, Badger *Meles meles canescens*, Hyaena *Hyaena hyaena*, Wild Cat *Felis sylvestris tristrami*, Wild Boar *Sus scrofa*, Goitred Gazelle *Gazella subgutturosa*, Cape Hare *Lepus capensis syriacus* and Crested Porcupine *Hystrix indica*.

Noteworthy flora: No information.

Scientific research and facilities: Mid-winter waterfowl counts were undertaken by biologists from the Faculty of Agriculture, University of Aleppo, in January 1993 and January 1994.

Management authority and jurisdiction: No information.

References: Evans (1994); Luther & Rzoska (1971).

Reasons for inclusion: 1a & 3b. One of the few remaining natural freshwater lakes in eastern Syria.

Source: See references.

Wetland Name: Tual al-'Abba

Country: Syrian Arab Republic

Coordinates: 36°25'N, 39°20'E

Location: 70-100 km north-northeast of Al-Raqqah, Al-Raqqah Governorate.

Area: Area of wetlands unknown; entire region c.30,000 ha.

Altitude: 300 m.

Overview: Various small permanent and seasonal lakes and marshes in a large area of steppe in the Balikh Valley, now much modified by agricultural activities but perhaps still important as a staging and wintering area for migratory waterfowl.

Physical and ecological features: The site comprises a large area of steppe with scattered permanent and seasonal lakes and marshes, to the east and southeast of Skiro village and bounded in the west by the Balikh Valley. Up until the early 1980s, there was a small, shallow, freshwater lake, Waz Gol (36°31'N 39°01'E; 25 ha) and some 25 ha of permanent marsh in the Balikh Valley. The main source of water for the lake was the spring of Am al-Arus; the marshes to the north of the lake were fed directly by branches of the Balikh River. However, in the autumn of 1984, the lake was completely dry, and by 1992, the lake, marshes, spring and river itself were all dry because of diversion of water for irrigation on the Anatolian Plateau in Turkey and pumping of groundwater for irrigation in Syria. Other wetlands in this area in the 1960s and 1970s included a complex of seasonally inundated fresh and saline marshes at Ali Bajiliyah in the Balikh Valley 100 km north of Al-Raqqah, extensive reed-beds and some areas of open water at Skiro, and Al-Sharkrak pond (c. 1 ha) about 10 km north of Skiro. No information is available on the present status of these wetlands or any others in the area, and their continued existence is in doubt. The vegetation at Waz Gol, and probably at wetlands elsewhere in the valley, consisted of *Salix* trees and stands of *Phragmites*, *Lythrum*, *Carex* and *Luzula*.

Land tenure: No information.

Conservation measures taken: None. The site has been identified as an Important Bird Area by BirdLife International (Evans, 1994).

Conservation measures proposed: None known.

Land use: The majority of the steppe is under cultivation for cereals and cotton or very heavily grazed by domestic livestock. Waterfowl hunting is widespread and uncontrolled.

Possible changes in land use: Continued drainage of wetlands and conversion to agricultural land.

Disturbances and threats: The drainage of wetlands in the Balikh valley and the conversion of steppe to rain-fed and irrigated farmland, with associated intensification of agriculture, use of agrochemicals and increased levels of human disturbance, are critical problems. Hunting pressure on waterfowl and gamebirds, including the Great Bustard *Otis tarda*, is apparently very heavy and uncontrolled. *Phragmites* reed-beds are burned to encourage re-growth for cattle grazing.

Hydrological and biophysical values: No information.

Social and cultural values: According to biblical legend, Am al-Arus was the spring at which Jacob met Rachel.

Noteworthy fauna: An important staging and wintering area for a wide diversity of waterfowl (including *Anser albifrons* and *Grus grus*) until at least the early 1980s. Ducks were reported to occur at Au Bajiliyah in summer, and large numbers were said to be present in winter (Savage, 1968). Over 1,380 waterfowl of 19 species were recorded in this area during a brief survey in December 1971, including one *Pelecanus* sp., 21 *Podiceps cristatus*, 89 *Anas penelope*, 275 *A. crecca*, 280 *A. platyrhynchos*, 532 *Aythya ferina*, 90 *Fulica atra* and small numbers of a variety of shorebirds (Dijksen & Koning, 1972). Passage migrants at Waz Gol in October 1982 included up to 200 *Tachybaptus ruficollis*, one *Phalacrocorax pygmaeus*, 20 *Ardea cinerea*, 30 *Anser anser*, 100 *Anas crecca*, 20 *Marmaronetta angustirostris*, 5 *Netta rufina*, 300 *Aythya ferina*, 20 *A. nyroca*, one *Oxyura leucocephala*, 400 *Fulica atra*, one *Vanellus gregarius* and four *V. leucurus* (Bottema, 1985). Known and probable breeding species in the Balikh Valley in the 1970s included *Marmaronetta angustirostris*, *Gallinula chioropus*, *Himantopus himantopus*, *Glareola pratincola* and *Sterna albifrons*. The Great Bustard *Otis tarda* was probably a regular winter visitor to the area in the 1970s (maximum 16 in March 1976), and may have bred in the past. No recent information is available on the avifauna, and it is not known if waterfowl continue to visit the area in significant numbers. The terrapin *Clemmys caspia* was reported to be very common at War Gol in the early 1980s.

Noteworthy flora: No information.

Scientific research and facilities: Mid-winter waterfowl counts were undertaken by an IWRB mission in December 1971 (Dijksen & Koning, 1972). Macfarlane (1978) visited the Skiro and Al-Sharkrak areas on several occasions in the 1970s, and Bottema (1985) surveyed the War Gol area in the early 1980s.

Management authority and jurisdiction: No information.

References: Bottema (1985); Dijksen & Koning (1972); Evans (1994); Macfarlane (1978); Savage (1968).

Reasons for inclusion: 3b. Possibly still an important staging and wintering area for migratory waterfowl, but poorly known.

Source: See references.

Wetland Name: Euphrates River

Country: Syrian Arab Republic

Coordinates: From 36°49'N, 38°02'E at the Turkish border to 34°29'N, 40°56'E at the Iraqi border, Halab, Al-Raqqah and Dayr al-Zawr Governorates.

Area: Unknown; c.420 km of river.

Altitude: From c.520 m at the Turkish border to c. 185 m at the Iraqi border.

Overview: The Euphrates River and associated wetlands from the Turkish border in the northwest to the Iraqi border in the southeast, including oxbow lakes, riverine marshes, wooded islands, gravel pits etc.; now much modified by agricultural development and with greatly reduced seasonal flooding as a result of dam-building upstream in Turkey, but still of great importance as a staging and wintering area for migratory waterfowl.

Physical and ecological features: The site comprises the River Euphrates (Al-Furat) and associated wetlands from its entry from Turkey to its exit into Iraq, except for the two reservoirs, Buhayrat al-Asad and Baath Lake, which are described separately as Sites 5 and 6, respectively. For almost its entire length, the river flows in a valley varying in width from 2 to 12 km, and with the valley floor some 80-250 m below the surrounding plains. In many places, the river divides into two or more channels, creating numerous islands, many of which support dense thickets. There are also numerous meanders, oxbow lakes, gravel pits and silted old water courses covered in reed-beds. Much of the river bank consists of low alluvial cliffs. The water level was formerly some 3-4 m higher in spring than in autumn, due to snow-melt in the Turkish uplands, but with the completion during the last decade of several large dams in Turkey, this annual flood is now greatly reduced. The natural vegetation includes riverine thickets of *Populus euphratica*, *Tamarix articulata*, *Salix* sp., *Glyzyriza glabra* and *Lycium barbarum*, and reed-beds of *Phragmites* sp. and *Typha* sp. The river banks are intensively cultivated: there are vast areas of irrigated cotton and cereals, as well as orchards and plantations of *Populus* and *Pinus halepensis*. The heavily cultivated steppe of the Jazirah region lies to the east and the Syrian Desert to the southwest.

Three areas which appear to be of special importance for waterfowl are as follows: (1) Halabiyat Zulbiyat (35°37'N, 39°50'E; 50 ha), an area of marsh and fish-ponds on the right bank of the river about 40 km northwest of Dayr al-Zawr; (2) Al-Shumaytiyah (35°28'N 39°59'E; 10-50 ha), an oxbow lake about 20 km northwest of Dayr al-Zawr, sandwiched between the Al-Raqqah to Dayr al-Zawr road and a 50 m cliff; and (3) Huwaijat al-Mayadin (35°00'N 39°28'E; 100-300 ha), a low-lying island in the middle of the Euphrates with *Populus*, *Tainarix* and *Salix* thickets and seasonally inundated marshes, near the town of Mayadin, 45 km southeast of Dayr al-Zawr.

Land tenure: Partly state owned and partly private.

Conservation measures taken: None. The Euphrates River valley was listed as a wetland of international importance by Carp (1980), and has been identified as an Important Bird Area by BirdLife International (Evans, 1994).

Conservation measures proposed: None known.

Land use: Gravel extraction occurs locally along the river. There is a considerable amount of fishing and waterfowl hunting, and the riverine woodland is exploited for firewood.

Possible changes in land use: The size of the annual flood and dry-season flow in the Euphrates will be further reduced when all of the dam-building schemes and associated irrigation projects planned along the river, both in Syria and upstream in Turkey, have been completed and are fully operational.

Disturbances and threats: The river flow has been greatly reduced in recent years as new dams constructed upstream in Turkey continue to fill. Threats at Halabiyat Zulbiyat, Al-Shumaytiyah and Mayadin include the continuing conversion of floodplain wetlands into agricultural land, overgrazing of marsh vegetation, and high levels of human disturbance. The riverine woodland is heavily exploited for firewood, despite the law forbidding this, and waterfowl hunting is widespread and uncontrolled.

Hydrological and biophysical values: No information.

Social and cultural values: There are interesting archaeological sites at a number of locations along the river, e.g. at Halabiyat Zulbiyat.

Noteworthy fauna: The Euphrates Valley is a major migration route for waterbirds, providing a narrow wetland corridor between the important wetlands of southern and central Turkey and the vast wetlands of Mesopotamia in Iraq. A wide variety of species has been recorded during the migration seasons and in winter, and several species are known or thought to breed. Some 3,400 waterfowl were observed on three small oxbows east of Al-Raqqah in December 1972, including 105 *Tachybaptus ruficollis*, 1,380 *Aythya ferina* and 1,750 *Fulica atra* (Koning & Dijkzen, 1973). In recent years, large numbers of waterfowl have been found wintering at Halabiyat Zulbiyat (18,470 in 1993, 16,090 in 1994), Al-Shumaytiyah oxbow lake (4,980 in 1993, 3,500 in 1994) and Mayadin Pool (3,080 in 1993, 2,375 in 1994). The most abundant species were *Podiceps cristatus*, *P. nigricollis*, *Tachybaptus ruficollis*, *Anser albifrons* (up to 400 at Mayadin), *A. anser* (up to 650), dabbling ducks *Anas* spp., *Fulica atra* and gulls *Larus* spp. Smaller numbers of *Pelecanus crispus* (up to 60 at Halabiyat Zulbiyat), *Ciconia ciconia*, *C. nigra*, *Phoenicopterus ruber* and *Tadorna tadorna* were also present. The wetlands also support good numbers of wintering birds of prey such as *Circus aeruginosus*, *C. cyaneus*, *C. macrourus* and *Asio flammeus*.

Common passage migrants include *Ciconia ciconia*, *Himantopus himantopus*, *Glareola pratincola*, *Tringa stagnatilis*, *T. hypoleucos*, *Philomachus pugnax*, *Sterna hirundo* and *Chlidonias hybridus*. There are also indications that the valley is a very important migration route for many other species of birds such as the Turtle Dove *Streptopelia turtur*, which is said to gather in hundreds of thousands on islands in the river in spring and autumn.

Common breeding birds include *Tachybaptus ruficollis*, *Francolinus francolinus*, *Gallinula chioropus*, *Fulica atra*, *Charadrius dubius*, *Vanellus spinosus*, *V. leucurus*, *Chlidonias hybridus*, *Sterna albifrons*, *Ceryle rudis*, *Merops superciliosus* and *Riparia riparia*. *Phalacrocorax pygmaeus* was reported to be

common and possibly breeding around Dayr al-Zawr in the 1980s, and has been noted in small numbers elsewhere along the river. *Marinaronetta angustirostris* is probably a widespread breeding species in the valley, although there are very few records (e.g. one was observed on two dates in June 1975 at Shumaytiyah). The Pin-tailed Sandgrouse *Pterocles alchata* is common on the adjacent plains, and visits the river in large numbers to drink.

Mammals known to have occurred in the area include Wolf *Canis lupus*, Red Fox *Vulpes vulpes arabica*, Badger *Meles meles canescens*, Common Otter *Lutra lutra*, Hyaena *Hyaena hyaena syriaca*, Wild Cat *Felis sylvestris tristrami*, Jungle Cat *F. chaus*, Wild Boar *Sus scrofa lybicus*, Goitred Gazelle *Gazella subgutturosa*, Cape Hare *Lepus capensis syriacus* and Crested Porcupine *Hystrix indica*.

Noteworthy flora: No information.

Scientific research and facilities: Mid-winter waterfowl counts were undertaken by IWRB missions in December 1971 and December 1972 (Dijksen & Koning, 1972; Koning & Dijksen, 1973), and by biologists from the Faculty of Agriculture, University of Aleppo, in January 1993 and January 1994.

Management authority and jurisdiction: No information.

References: Carp (1980); Dijksen & Koning (1972); Evans (1994); Koning & Dijksen (1973); Luther & Rzoska (1971); Macfarlane (1978); Scott (1993).

Reasons for inclusion: 1c, 2a, 2b, 3a & 3c. One of the major rivers of the Middle East; a vitally important internationally-shared water resource and a major migration route for migratory waterbirds. The wetlands provide breeding and/or wintering habitat for at least three globally threatened species, and support large numbers of wintering waterfowl of a wide variety of species.

Source: See references.

Wetland Name: Buhayrat al-Mad

Country: Syrian Arab Republic

Coordinates: 35°47'-36°20'N; 38°02'-38°34'E. Approximate centre: 35°55'N, 38°20'E.

Location: 40 km west of Al-Raqqah, Al-Raqqah and Halab Governorates.

Area: 63,000 ha.

Altitude: 308 m.

Overview: A huge water storage reservoir on the Euphrates River, completed in the 1970s and now of considerable importance as a staging and wintering area for migratory waterfowl.

Physical and ecological features: Buhayrat al-Asad (Lake Asad) is a huge reservoir of about 63,000 ha created by a dam on the River Euphrates (Al-Furat) near the town of AlThawra. The reservoir extends for about 80 km up the valley, and averages 8 km in width. Work began on the dam in 1968, and construction was completed in the early 1970s. The shores are mainly steep and rocky, and the water is very clear and without sediment. A large island, Jazirat al-'Ayd (also known as Jazirat al-Thawra) is linked to the mainland by a causeway with a gate. Much of the land around the reservoir is dry, stony, and almost devoid of

vegetation. However, the Ministry of Agriculture and Agrarian Reform has recently afforested large areas on the southern shore of the lake, on the island of al-'Ayd and around Al-Thawra with *Pinus halepensis*, *Robinia pseudoacacia*, *Populus euphratica*, *Olea* sp., *Cupressus* sp., *Eucalyptus* sp., *Nerium oleander* and *Amygdalus* sp.

Land tenure: State owned.

Conservation measures taken: Jazirat al-'Ayd is protected by the Government; unauthorized entry of vehicles or people is not allowed, and there is a guard at the gate. Management of the island is geared primarily towards public recreation; the island is being established as a nature park with a tourist centre and a network of vehicle tracks. Hyaenas *Hyaena hyaena* have been introduced, and there are plans to introduce Goitred Gazelles *Gazella subgutturosa*. The reservoir has been identified as an Important Bird Area by BirdLife International (Evans, 1994).

Conservation measures proposed: None known.

Land use: The dam is used for hydro-electric power generation, and there is some fishing and outdoor recreation. Sugar-cane and cereals are cultivated in the southeast. Hunting is common in the surrounding area.

Possible changes in land use: None known.

Disturbances and threats: Some hunters enter the area illegally, and hunting pressure is heavy in the surrounding area. Over-fishing may also be a problem.

Hydrological and biophysical values: No information.

Social and cultural values: There is an important historical site, Jabbar Castle, on the east side of the lake near the dam.

Noteworthy fauna: Since its completion in the 1970s, the reservoir has become a very important staging and wintering area for migratory waterfowl, and also supports some breeding birds. Areas found to be of particular importance for waterfowl in the 1970s included the west bank of the reservoir at the northern end, 30 km southeast of Manbij, and the southeast corner 8 km southwest of the dam. Huge numbers of waterfowl winter in the area, with many birds fighting out to feed on the surrounding steppe and roosting at the lake. Some 1,200 *Anser albifrons* were observed in the area in January 1975. Counts in recent years have included up to 150 *Podiceps cristatus*, 100 *P. nigricollis*, 140 *Phalacrocorax carbo*, 40 *Pelecanus crispus*, 100 *Egretta garzetta*, 100 *Casmerodius albus*, 225 *Ardea cinerea*, 30 *Platalea leucorodia*, 300 *Anser albifrons*, 150 *A. anser*, 50 *Tadorna tadorna*, 300 *Anas penelope*, 2,000 *A. platyrhynchos*, 700 *A. clypeata*, 800 *Aythya ferina*, 150 *A. fuligula*, 10,000 *Fulica atra*, 20 *Larus ichthyæetus*, 2,000-3,000 *L. cachinnans* and 3,000 small gulls *Larus* spp. Other species which have been recorded in substantial numbers on passage include *Ardea purpurea*, *Ciconia ciconia*, *Anas querquedula*, *Grus grus*, *Recurvi rostra avosetta*, *Calidris minuta*, *Tringa erythropus*, *T. nebularia*, *Philomachus pugnax* and *Gelochelidon nilotica*; scarce passage migrants have included *Phalacrocorax pygmaeus* (one in April 1993), *Pandion haliaetus* (singles in March and September 1976) and *Vanellus gregarius* (40 in September 1974). Breeding birds include *Tachybaptus ruficollis*, *Larus genei* (on the island of Tell al-Abyad near the dam), *Sterna hirundo*, *S. albifrons* and *Ceryle rudis*. *Larus melanocephalus* has been recorded in summer (20 adults in June 1975), and may breed.

Mammals said to occur in the area include Wolf *Canis lupus*, Red Fox *Vulpes vulpes arabica*, Badger *Meles meles canescens*, Hyaena *Hyaena hyaena syriaca* and Wild Cat *Felis sylvestris tristrami*.

Noteworthy flora: No information.

Scientific research and facilities: Mid-winter waterfowl counts were undertaken by biologists from the Faculty of Agriculture, University of Aleppo, in January 1993 and January 1994.

Management authority and jurisdiction: No information.

References: Evans (1994); Scott (1993).

Reasons for inclusion: 2a & 3a. An extremely important staging and wintering area for migratory waterfowl including at least one globally threatened species (*Pelecanus crispus*).

Source: See references.

Wetland Name: Baath Lake

Country: Syrian Arab Republic

Coordinates: 35°52'N, 38°38'E

Location: about 30 km west of Al-Raqqah, Al-Raqqah Governorate.

Area: c.100 ha.

Altitude: c.250 m.

Overview: A small water storage reservoir on the Euphrates River, of importance as a staging and wintering area for migratory waterfowl.

Physical and ecological features: A shallow lake, about 10 km long, formed by a dam on the Euphrates (Al-Furat) at Mansurah, 10 km downstream from the main dam of Buhayrat al-Asad at Al-Thawra. The upper reaches of the lake are shallow with a number of islands fringed by *Phragmites* reed-beds.

Land tenure: State owned.

Conservation measures taken: Hunting is prohibited around the reservoir. The site has been identified as an Important Bird Area by BirdLife International (Evans, 1994).

Conservation measures proposed: None known.

Land use: The reservoir is used as a source of water for irrigation.

Possible changes in land use: No information.

Disturbances and threats: No information.

Hydrological and biophysical values: No information.

Social and cultural values: No information.

Noteworthy fauna: The lake is reported to be an important roosting and loafing area for waterfowl during the migration seasons and in winter, especially ducks (Anatidae). Waterbirds present in November 1992 included 100 *Ardea cinerea*, 800-1,000 *Anser anser*, 900 *Anas penelope*, 700 *A. strepera*, 200 *A. crecca*, 100 *A. clypeata*, 5,000 *Fulica atra*, 30 *Tringa nebularia*, 1,000-2,000 *Larus* sp., 40 *Alcedo atthis* and 40 *Ceryle rudis*. Mammals said to occur in the area include Wolf *Canis lupus*, Red Fox *Vulpes vulpes arabica* and Hyaena *Hyaena hyaena*.

Noteworthy flora: No information.

Scientific research and facilities: An ornithological survey was carried out in November 1992. No other information seems to be available on the fauna.

Management authority and jurisdiction: No information.

References: Evans (1994).

Reasons for inclusion: 3b. An important staging and wintering area for migratory waterfowl.

Source: See references.

Wetland Name: Sabkhat al-Jabbul

Country: Syrian Arab Republic

Coordinates:

Location: 36°04'N, 37°30'E; 30 km east-southeast of Halab (Aleppo), Halab Governorate.

Area: 37,500 ha; maximum extent of flooding in recent years c. 10,000 ha.

Altitude: 307 m.

Overview: A large, permanent saline lake in semi-arid steppe, recently increased in size by the inflow of surplus irrigation water and apparently now developing emergent aquatic vegetation; important for salt production and as a staging and wintering area for migratory waterfowl, notably *Phoenicopus ruber*.

Physical and ecological features: Sabkhat al-Jabbul (Jabbul Salt Lake) is a large, shallow salt lake in an enclosed basin of about 37,500 ha, immediately to the south of Jabbul village. In the 1970s, the lake was fed entirely by local run-off in winter and spring, and its extent was highly variable from year to year. In wet years, the maximum area of open water was about 3,000 ha, and the lake apparently seldom dried out completely. A levee on the east side of the lake prevented flooding of the extensive salt flats in the eastern part of the basin. However in 1988, large new irrigation projects on the nearby steppe began discharging surplus water into the lake on a substantial scale. This appears to have resulted in higher and more stable water levels and lower salinities than in the past. The lake currently measures up to 20 km in length and 5 km in width, and at high water levels contains two large islands. In the 1970s, the muddy and sandy shores of the lake supported little or no marginal vegetation, but there are now extensive *Phragmites* reed-beds along parts of the southern and south-eastern shores and perhaps elsewhere. The surrounding steppe is dominated by species such as *Aeluropus littoralis*, *A. lagopoides*, *Atriplex leucoclada*, *A. halimus*, *Anabasis setifera*, *Calligonum comosum*, *Salsola vermiculata*, *Stipa barbata* and *Popaver rhoeas*, with scattered *Haloxylon* and *Artemisia* shrubs.

Land tenure: State owned.

Conservation measures taken: None. Sabkhat al-Jabbul was listed as a wetland of international importance by Carp (1980), and has been identified as an Important Bird Area by BirdLife International (Evans, 1994).

Conservation measures proposed: None known.

Land use: The lake is used for salt production on a large scale. Nomadic pastoralists graze their livestock, mainly sheep and goats, on the surrounding steppes, and there is a considerable amount of hunting in the area. In the 1970s, the bare salt flats to the east of the lake were used as an artillery firing range.

Possible changes in land use: No information.

Disturbances and threats: The long-term impact of the changes to the lake's

hydrology on its value for waterfowl and other wildlife is unclear. Waterfowl shooting is intense throughout the winter, and bag limits and hunting seasons are not enforced; however the large size and openness of the lake give some natural protection.

Hydrological and biophysical values: No information.

Social and cultural values: No information.

Noteworthy fauna: Sabkhat al-Jabbul is an important staging and wintering area for migratory waterfowl, and also supports some breeding waterbirds. Large numbers of wintering waterfowl were recorded in the 1970s, with "tens of thousands" present in some years, but the numbers of waterfowl varied widely according to water level. In recent years, the lake appears to have been supporting even larger numbers of waterfowl, presumably because of the higher and more stable water level. The lake is particularly important for Greater Flamingos *Phoenicopterus ruber*; between 500 and 1,000 are regularly present at most times of the year, and some 6,000-8,000 were recorded in January 1975. Other wintering species include *Casmerodius albus* (15), *Platalea leucorodia* (50), *Ciconia ciconia* (30), *C. nigra*, *Cygnus olor*, *Anser albifrons* (2,030 in December 1972), *A. anser* (600), *Tadorna ferruginea* (300), *T. tadorna* (500), *Anas crecca* (thousands), *A. platyrhynchos* (600), *A. acuta* (1,000), *Fulica atra* (10,000), *Grus grus* (155 in December 1972), *Eudromias morinellus* (72), *Vanellus vanellus* (380); *Calidris minuta* (many hundreds) and *Ceryle rudis* (200). *Branta ruficollis* has been recorded by hunters, and is presumably a rare winter visitor to the area. Waterfowl recorded on spring migration (in April) have included up to 100 *Podiceps nigricollis*, 70 *Platalea leucorodia*, 400 *Tadorna ferruginea*, 200 *Himantopus himantopus*, 3,000 *Calidris minuta*, thousands of *Philomachus pugnax* and 100 *Larus genei*. *Marinaronetta angustirostris* and *Oxyura leucocephala* have occurred on passage in April, although only in very small numbers.

Confirmed or probable breeding species include *Himantopus himantopus*, *Recurvirostra avosetta*, *Cursorius cursor*, *Charadrius alexandrinus*, *C. leschenaultii columbinus*, *Gelochelidon nilotica*, *Sterna caspia* and *S. albifrons*. According to local people *Phoenicopterus ruber* sometimes breeds; at least 700 were present in April 1993. *Glareola nordmanni* was formerly a summer visitor to the area, but has not been recorded in recent decades.

Mammals said to occur in the area include Wolf *Canis lupus*, Red Fox *Vulpes vulpes arabica*, Hyaena *Hyaena hyaena syriaca*, Goitred Gazelle *Gazella subgutturosa*, Cape Hare *Lepus capensis syriacus*, Crested Porcupine *Hystrix indica* and Lesser Mole Rat *Spalax leucodon*.

Noteworthy flora: No information.

Scientific research and facilities: Mid-winter waterfowl counts were undertaken by IWRB missions in December 1971 and December 1972 (Dijksen & Koning, 1972; Koning & Dijksen, 1973) and by biologists from the Faculty of Agriculture, University of Aleppo, in January 1993 and January 1994.

Management authority and jurisdiction: No information.

References: Bodenham (1944); Carp (1980); Clarke (1924); Evans (1994);

Hollom (1959); Savage (1968); Scott (1993).

Reasons for inclusion: 1a, 3a & 3c. The largest permanent salt lake in Syria and an extremely important staging and wintering area for migratory waterfowl, occasionally holding over 1 % of the regional population of Greater Flamingos *Phoenicopterus ruber*.

Source: See references.

Wetland Name: Sabkhat Muh

Country: Syrian Arab Republic

Coordinates: 34°28'N, 38°20'E

Location: several km south and southeast of Tadmur (Palmyra), Hims Governorate.

Area: c.20,000 ha.

Altitude: 403 m.

Overview: A seasonally flooded saline lake in the Syrian Desert, of some importance for migratory waterfowl and a possible breeding area for *Charadrius leschenaultii columbinus*, but poorly known.

Physical and ecological features: Sabkhat Muh is a seasonally flooded salt-lake, up to 25 km long and 10 km wide, in an enclosed drainage basin surrounded by limestone and marl hills. There are some scattered *Tamarix* bushes around the margins of the lake. The surrounding desertic steppe is sparsely vegetated with perennial tussock-grass, Chenopodiaceae and *Artemisia* sp., and there is an isolated oasis to the north of the lake with extensive date-palm gardens.

Land tenure: No information.

Conservation measures taken: None. Sabkhat Muh is part of a larger site (45,000 ha) identified as an Important Bird Area by BirdLife International (Evans, 1994).

Conservation measures proposed: None known.

Land use: The main land use in the surrounding area is livestock grazing.

Possible changes in land use: No information.

Disturbances and threats: The lake is relatively remote and probably under little threat. However, the surrounding desertic steppe is increasingly coming under pressure from grazing by domestic livestock, as the use of water bowsers becomes more widespread.

Hydrological and biophysical values: No information.

Social and cultural values: Tadmur (Palmyra), to the north of the lake, is famous for its Roman ruins.

Noteworthy fauna: Little information is available. Waterfowl recorded at the salt lake in autumn and winter have included *Phoenicopterus ruber* (90 in November 1974) and *Grus grus*. *Eudromias morinellus* appears to be a common winter visitor to the surrounding plains; flocks totalling 200 have been observed in the area in November. The scarce and local Southwest Asian subspecies of Greater Sand Plover *Charadrius leschenaultii columbinus* has been observed displaying in spring, and probably breeds in the area. The oasis to the north of the lake provides the only substantial shelter for migrating birds for 150 km to the north and west and for much further to the south and east. It appears to be especially important

for migrating raptors such as *Pernis apivorus*, *Buteo buteo*, *Milvus migrans*, *Circus macrourus* and *C. pygargus*. The Houbara Bustard *Chiamydotis undulata* apparently breeds in the surrounding desert, along with a characteristic assemblage of desert species.

Mammals reported to occur in the area include Wolf *Canis lupus*, Caracal *Lynx caracal* and Goitred Gazelle *Gazella subgutturosa*.

Noteworthy flora: No information.

Scientific research and facilities: None known, other than preliminary ornithological surveys.

Recreation and tourism: The ruins at Tadmur are much visited by tourists.

Management authority and jurisdiction: No information.

References: Evans (1994); Macfarlane (1978).

Reasons for inclusion: 1a & 3b. A good example of a natural salt lake of importance for migratory waterfowl.

Source: See references.

Wetland Name: Bahrat Horns (Lake Qattine)

Country: Syrian Arab Republic

Coordinates: 34°38'N, 36°35'E

Location: 12 km southwest of Hims (Homs), Hims Governorate.

Area: 5,300 ha.

Altitude: 500 m.

Overview: A very old water storage reservoir on the Asi (Orontes) River, of considerable importance as a staging and wintering area for migratory waterfowl, notably *Marmaronetta angustirostris* and *Oxyura leucocephala*, both of which may breed.

Physical and ecological features: A semi-artificial, eutrophic reservoir (also known as Lake Qattine) just west of Qattine town, formed by impoundment of the Asi River, the original dam dating back to Roman times. The lake is about 12 km long and up to 4 km wide. The shores of the northeastern half are steep, while those along the southwestern half are very flat. In summer, the lake shrinks to about 3,000 ha, exposing large areas of mudflat in the southwest; in winter, the seasonal rainfall and snow-melt fill the lake to its maximum extent of about 5,300 ha. The water depth is 4-8 m. There is one small permanent island, Tell et Tine, but at high water levels, several other knolls, Tell es Seghir, Tell el Kebir and Tell es Seur, on either side of the Asi River where it flows into the lake, become islands for a few months, and Moudane, normally two km from the water's edge, itself becomes almost an island. The lake supports little aquatic vegetation, and the shores are mainly bare mud, although there are some patches of *Tamarix tetendra*, *Salix alba*, *Nerium oleander*, *Phragmites communis*, *Typha latifolia*, *Vitex agnus*, *Elaeagnus angustifolia* and *Scilla maritima*. To the south of the lake, the land is fertile and cultivated, but to the north there is a large area of lava flow. Villages are scattered around the lake shore.

The average annual rainfall in the area is about 450 mm, and the mean annual

temperature 15.9°C.

Land tenure: The lake and surrounding shores are state owned.

Conservation measures taken: None. The site has been identified as an Important Bird Area by BirdLife International (Evans, 1994).

Conservation measures proposed: The lake was proposed as a site for conservation under Project AQUA by the Ministry of Agriculture and Agrarian Reform in the late 1960s (Luther & Rzoska, 1971).

Land use: The lake is used to provide water for irrigation purposes; there is some fishing and a considerable amount of waterfowl hunting. Farming is the principal activity in adjacent areas. There are several large factories (including cement, phosphate and urea factories) at the east end of the lake near Qattine.

Possible changes in land use: No information.

Disturbances and threats: There is some pollution from the phosphate and urea factories near Qattine, and levels of disturbance are high, especially from recreational use (water sports) and fishing activities. Over-fishing is reported to be a problem, and there is heavy hunting pressure on waterfowl, especially on Fridays and public holidays. Common Carp *Cyprinus carpio* have been introduced into the lake.

Hydrological and biophysical values: No information.

Social and cultural values: No information.

Noteworthy fauna: An extremely important staging and wintering area for migratory waterfowl, regularly supporting over 20,000 waterfowl in mid-winter. Macfarlane (1978) observed "tens of thousands" of *Fulica atra* on the lake in the winter of 1976/77, along with perhaps as many as 10,000 ducks and 300 *Anser albifrons*. Over 22,400 waterfowl were recorded on the lake in January 1993, and over 15,100 in January 1994. These included up to 220 *Podiceps cristatus*, 300 *P. nigricollis*, 30 *Pelecanus onocrotalus*, 100 *Egretta garzetta*, 150 *Casmerodius albus*, 700 *Anser* sp., 150 *Tadorna tadorna*, 700 *Anas strepera*, 200 *A. crecca*, 300 *A. acuta*, 20 *Marinaronetta angustirostris*, 250 *Netta rufina*, 7,000 *Aythya ferina*, 8,000 *A. fuligula* and 9,000 *Fulica atra*. *Oxyura leucocephala* appears to be a regular winter visitor; 57 were present in February 1976, 100 in February 1977, 30 in January 1993 and 35 in January 1994. This species has been recorded in small numbers in summer, and may breed. Other possible breeding species include *Podiceps cristatus*, *Marinaronetta angustirostris* and *Porphyrio porphyrio*. Counts of waterfowl on passage have included up to 100 *Ardea cinerea*, 4,000 *Anas crecca*, 40 *A. querquedula* and several hundred marsh terns *Chlidonias* spp. *Botaurus stellaris* and *Plegadis falcinellus* have been observed in November. Up to 4,000 shorebirds have been recorded in autumn and in winter, including *Vanellus vanellus* (up to 130), *Limosa limosa*, *Numenius arquata*, *Tringa erythropus* (up to 500), *T. totanus* (up to 400), *Gallinago gallinago* (up to 100), *Calidris minuta* (common), *C. temminckii* and *C. alpina* (common).

Mammals said to occur in the area include Wolf *Canis lupus*, Red Fox *Vulpes vulpes arabica*, Badger *Meles meles canescens*, Hyaena *Hyaena hyaena syriaca*, Wild Boar *Sus scrofa lybicus* and Cape Hare *Lepus capensis syriacus*.

Noteworthy flora: No information.

Scientific research and facilities: Mid-winter waterfowl counts were undertaken

by an IWRB mission in December 1971 (Dijksen & Koning, 1972) and by biologists from the Faculty of Agriculture, University of Aleppo, in January 1993 and January 1994. Macfarlane (1978) carried out a number of avifaunal surveys at the lake in 1976 and 1977.

Management authority and jurisdiction: No information.

References: Evans (1994); Kumerloeve (1967-1969); Luther & Rzoska (1971); Macfarlane (1978).

Reasons for inclusion: 2a, 3a & 3c. An extremely important staging and wintering area for migratory waterfowl including two globally threatened species, *Marmaronetta angustirostris* and *Oxyura leucocephala*.

Source: See references.

Wetland Name: Buhayrat al-Laha

Country: Syrian Arab Republic

Coordinates: 34°41'N, 36°00'E

Location: south of Hamidiyah near the Lebanese border, 25 km south-southeast of Tartus, Tartus Governorate.

Area: c.50 ha.

Altitude: Near sea level.

Overview: A small area of wetlands on the Mediterranean coast near the Lebanese border; thought to be of importance for migratory waterfowl but very poorly known.

Physical and ecological features: Buhayrat al-Laha, only about 2 km north of the Lebanese border, is the only remaining natural coastal wetland in Syria. The coast is low and predominantly sandy, with some permanent rivers rising in the coastal ranges; settlements are few and small.

Land tenure: No information.

Conservation measures taken: None. The site has been identified as an Important Bird Area by BirdLife International (Evans, 1994).

Conservation measures proposed: The site was proposed as a reserve for nature conservation by a Task Force of the UNEP Regional Activity Centre for Mediterranean Specially Protected Areas in 1989 (Jeudy de Grissac, 1989).

Land use: No information.

Possible changes in land use: No information.

Disturbances and threats: The site is threatened by drainage for cultivation, pesticide run-off and hunting.

Hydrological and biophysical values: No information.

Social and cultural values: No information.

Noteworthy fauna: The site is said to be very important for migratory birds, but no details are available.

Noteworthy flora: No information.

Scientific research and facilities: None known.

Management authority and jurisdiction: No information.

References: Evans (1994); Jeudy de Grissac (1989).

Reasons for inclusion: id & 2b. Apparently the only surviving natural coastal wetland in Syria and one of very few wetlands on the entire east coast of the

Mediterranean Sea. Source: See references.

Wetland Name: Jabal Sis Lakes

Country: Syrian Arab Republic

Coordinates: 33°18'N, 37°22'E

Location: about 100 km east-southeast of Damascus and 55 km south of the main road from Damascus to Iraq, Dimashq Governorate.

Area: Unknown.

Altitude: c.600 m.

Overview: A group of small rain-fed lakes and pools in and around an extinct volcanic crater in the Syrian Desert; probably an important breeding area for *Charadrius leschenaultii columbinus*, but very poorly known.

Physical and ecological features: The site comprises a group of small, mostly seasonal lakes and associated bare flats in and around the extinct volcanic crater of Jabal Sis (Sies), the largest of many such craters within the huge basalt lava field which covers much of southern Syria and northern Jordan. The crater lies near the eastern edge of the basalt, and rises about 100 m above the surrounding plain. Rainfall in winter and spring creates small lakes and pools in scattered pans of impermeable clay, and there is a rainfed lake at the foot of Jabal Sis itself. Vegetation is sparse.

Land tenure: No information.

Conservation measures taken: None. The wetlands have been included within a much larger site (40,000 ha) identified as an Important Bird Area by BirdLife International (Evans, 1994).

Conservation measures proposed: None known.

Land use: Nomadic pastoralists graze their flocks in the area in spring and early summer. The terrain is impassable to vehicles except along tracks, of which there are few.

Possible changes in land use: No information.

Disturbances and threats: The area is too remote and inhospitable to be under much threat, although the bringing in of water in barrels has increased grazing pressure in the area, and there is some shooting of sandgrouse *Pterocles* spp. in winter.

Hydrological and biophysical values: No information.

Social and cultural values: No information.

Noteworthy fauna: Probably an important breeding area for the scarce and local Southwest Asian subspecies of the Greater Sand Plover *Charadrius leschenaultii columbinus*. About 100 *C. leschenaultii* were seen around the rain-flooded pans in late May 1976, and 14 birds were again present in this area in March 1977. *Cursorius cursor* is a common breeding bird in the surrounding desert. The sandgrouse *Pterocles orientalis* and *P. aichata* occur in good numbers in winter and spring, and the Houbara Bustard *Chiamydotis undulata* probably breeds in the area.

Noteworthy flora: No information.

Scientific research and facilities: None known, other than preliminary ornithological surveys.

Management authority and jurisdiction: No information.

References: Evans (1994); Macfarlane (1978).

Reasons for inclusion: id & 3c. An interesting group of permanent and seasonal pools and clay pans in a basalt lava area, and probably a breeding area for over 1 % of the world population of *Charadrius leschenaultii columbinus*.

Source: See references.

Wetland Name: Yarmuk Valley and Lake Muzayrib

Country: Syrian Arab Republic

Coordinates: 32°44'N, 35°52'E

Location: in the extreme southwest of Syria, on the Jordanian border, Dar'a Governorate.

Area: Yarmuk Valley 20,000 ha; Lake Muzayrib 50 ha.

Altitude: Lake Muzayrib at 500 m.

Overview: A perennial river system on the Jordanian border with relatively undisturbed riverine vegetation, and a small freshwater lake on the adjacent plateau. The fauna and flora are characteristic of the upper Jordan Valley.

Physical and ecological features: The Yarmuk River runs along part of the border between Syria and Jordan at the southern end of the Golan Heights, and eventually joins the Jordan River a few km south of Lake Tiberias (see Jordanian Site 1). Major tributaries on Syrian territory include the Nahr al-Allan, entering from the north, and Wadi al-Thahab, entering from the east. The watercourses lie in steep, narrow wadis cutting through a plateau with well-watered farmland, and although the sides of the valleys are barren, the bottoms are full of lush vegetation including stands of *Phragmites communis*, *Nerium oleander* and *Juncus maritimus*. The average annual flow in the Yarmuk River is in the region of 360-400 million cubic metres. Lake Muzayrib (32°42'N 36°01 'E) lies in a shallow depression on the plateau (Wadi al-Thahab), just west of AlMuzayrib village and about 12 km northwest of Dar'a. It is a natural, spring-fed, mesotrophic lake of about 50 ha, with a mean depth of 2.5 m and banks of grazed turf.

There is at least one *Phragmites* reed-bed. The lake is surrounded by agriculture and many houses.

Land tenure: Lake Muzayrib is state owned.

Conservation measures taken: None. The Yarmuk Valley has been identified as an Important Bird Area by BirdLife International (Evans, 1994).

Conservation measures proposed: Lake Muzayrib was proposed as a site for conservation under Project AQUA by the Ministry of Agriculture and Agrarian Reform in the late 1960s (Luther & Rzoska, 1971).

Land use: The lake is used for irrigation purposes, fishing, fish-farming and recreation (picnicking, etc.). The adjacent plateau is mostly under cultivation, mainly for wheat.

Possible changes in land use: There have long been plans for a large-scale, joint Jordanian-Syrian dam across the Yarmuk River (Wahda or Unity Dam), which would potentially be a critical threat to the riverine wetlands.

Disturbances and threats: Fish (*Cyprinus carpio* and *Tilapia* sp.) have been

introduced into Lake Muzayrib, where intensification of fish production was cited as a potential threat in the late 1960s (Luther & Rzoska, 1971). There is some hunting locally.

Hydrological and biophysical values: No information.

Social and cultural values: No information.

Noteworthy fauna: Breeding birds include *Halcyon smyrnensis*, *Acrocephalus melanopogon*, *A. stentoreus*, *A. arundinaceus*, *Cisticolajuncidis* and *Passer moabiticus* (at Lake Muzayrib). *Remiz pendulinus* and *Passer hispaniolensis* have been recorded in winter. A wide variety of waterfowl have been recorded at Lake Muzayrib in small numbers on passage, including *Nycticorax nycticorax*, *Ardeola ralloides*, *Ardea purpurea*, *Ciconia ciconia*, *C. nigra*, *Aythya nyroca*, *Fulica atra* and several species of shorebirds. The Common Otter *Lutra lutra* and Jungle Cat *Felis chaus* are reported to occur in the area. Fish include *Tilapia gallileae*, a species endemic to the Jordan Valley.

Noteworthy flora: No information.

Scientific research and facilities: None known, other than preliminary ornithological surveys.

Management authority and jurisdiction: No information.

References: Evans (1994); Luther & Rzoska (1971); Macfarlane (1978).

Reasons for inclusion: 1c & 2b. A good example of a relatively intact riverine system along an international border.

Source: See references.

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