

## Information Sheet on Ramsar Wetlands

1. Date this sheet was completed/updated: 17 February 1999
2. Country: Algeria
3. Name of wetland: Lac des Oiseaux (Garaet and Touyour)
4. Geographical coordinates:  
  
    36° 47' North latitude  
    08° 07' East longitude
5. Altitude: Six metres above sea level
6. Area: 70 hectares in winter and 40 hectares in summer
7. Overview:

The region of El Kala is a system of freshwater environments of unique importance in North Africa. Lac des Oiseaux is located in this group of depressions that are characteristic of the region. It is a freshwater lake whose depth does not exceed two metres, located in a basin that opens onto an alluvial plain drained by the oval-shaped Mafragh Oued. Its shores are slightly sloped, ending in small beaches.

8. Wetland type:

Continental: O

9. Ramsar criteria: 2a, 2b, 2c, 2d

Criteria that best characterize the site: 3c

10. Map of site included? Please tick yes -or- no

11. Name and address of the compiler of this form:

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12. Justification of the criteria selected under point 9, on previous page:

Criterion 2a: Lac des Oiseaux is the habitat of a significant number of rare or endangered animal and plant species including the following.

The white-headed duck (*erismature à tête blanche*) (*Oxyura leucocephala*) is an endangered species at the world level. Its population is declining throughout the

Palearctic. Breeding of more than six couples of this species was observed at the lake. The Algerian population of white-headed duck represents approximately 2.7 per cent of the total world population.

The ferruginous duck (*fuligule nyroca*) (*Aythya nyroca*), whose reproduction is irregular and very small, was confirmed at the lake. This species is also endangered throughout its distribution and occupies the same habitat as the white-headed duck. Lac des Oiseaux is also the habitat of several species of odonates, of which four species are rare: *Brachythemis leucostica*, *Diplacodes lefebvreii*, *Orthetrum chrysostigma* and *Trithemis annulata*. Several species of plants of different biogeographical origin are considered rare: *Alternanthera sessilis*, *Digitaria debilis*, *Echinochloa repens*, *Lippia nodiflora*, *Paspalum distichum* and *Polygonum senegalense*, all tropical and subtropical species, and *Apium crassipes*, which is Mediterranean.

Criterion 2b: Lac des Oiseaux has a special value for maintenance of biodiversity because of the richness and diversity of its fauna and flora. Within an area of less than 70 hectares, there are about 200 species of plants of various biogeographical origin, 45 species of birds and 23 species of odonates. In addition, the most recent surveys at the site discovered three new unrecorded plant species in Algeria: *Asparagus officinalis*, *Cotula coronopifolia* and *Cyperus aristatus*.

Criterion 2d: Lac des Oiseaux has a special value because of the presence of the white-headed duck (*erismature à tête blanche*).

Criterion 3c: The population of white-headed ducks in Lac des Oiseaux is more than two per cent of the global population. In 1998, 164 specimens were recorded. Data gathered since 1986 during the winter surveys show that despite large fluctuations from year to year, 400 specimens have been recorded. Conservation methods are needed to maintain a stable population during the next few years and to preserve the status of the lake as a place for the gathering of white-headed ducks.

Figure 1. Variation in the population of white-headed duck (*Oxyura leucocephala*) in Lac des Oiseaux (1986-1998) during January.

Year	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number	10	78	3	90	13	51	28	82	17	53	2	0	164

Monitoring over four years (1989-1992) during a doctoral study showed that March was the best month for studying changes in the population of white-headed duck over a number of years. Compared with January, March has the largest monthly concentration, showing the importance of Lac des Oiseaux for the Algerian population of white-headed duck during March.

Figure 2. Variation in the population of white-headed duck (*Oxyura leucocephala*) in Lac des Oiseaux (1989-1992) during March.

Year	1989	1990	1991	1992
Number	122	155	124	201

### 13. General location:

Lac des Oiseaux is located in north-eastern Algeria in the wilaya of El Tarf, 25 kilometres from the capital of the wilaya, 40 kilometres from the city of El Kala and several metres from the village of El Kala.

During the most recent census in 1987, the human population in Lac des Oiseaux was 7553 persons. This number, now larger, will be updated after the results of the 1998 national census. The commune has an area of 8588 hectares, and the population density is 88 persons/square kilometre. There are 1519 persons economically active.

Its strategic geographical position and that of the village of Lac des Oiseaux along National Highway 44, acting as a stopover, has made north-south and east-west development possible. In 1987, 1149 houses were recorded. If no action is taken by the local authorities to regulate rapid urbanization, changes and even threats to the viability of Lac des Oiseaux, primarily from domestic wastewater, will occur.

### 14. Physical features:

**Geology:** A north-south cross section through the lake shows the importance of tangential geological intrusions during the Tertiary. After that period of uplifting, there was a phase of erosion of the lake basin and surrounding marshes. In the basin of Lac des Oiseaux, there are two main geological formations: those from the Tertiary forming the main substratum of the basin, characterized by sandstone clay from the Numidien aquifer. The formation is on very thick clays and marl more than 200 metres thick, distributed throughout the basin. In the south, the formation is covered by a series of mixtures of alternating clays and hard sandstone banks sometimes rough, permeable and eroded. These sandstone formations reach the surface in the form of large areas, several metres thick, forming visible ridges (Koudiet Nemlia) along which the watersheds separate. The alluvial and lacustrine formations on which the lake is located are from the general Quaternary.

Formations from the Quaternary directly cover scattered depressions within the Numidian aquifer. North of the basin, borings have identified deposits of pebbles, gravel, sand and silt. These deposits are the source of the changes and erosion south of La Cheffia Hills and the coastal area of influence. These rough and fine continental sediments accumulate during periods of wetter climate, creating various levels of alluvial terraces, which rest on an important series of Numidian clays forming an impermeable substratum of several aquifers of the eastern Annaba plain.

**Soils:** Lac des Oiseaux is formed by two types of soil: one zonal, depending on the climate, and the other azonal. There are two categories of zonal soils: saturated acidic soils formed on non-acidic bedrock (Numidian clays) and podzols formed on permeable bedrock. There are three categories of azonal soils: marsh soil, hydromorphic soil (*gyttga*), characterized by a free aquifer, and marsh soils formed from the surface layers of dry marshes.

**Hydrology:** The lake's hydrological regime depends on meteorology and is fed by the surrounding springs. In addition, several tributaries flow from the crests of the water

basin, an area of 3900 hectares whose contribution is important in winter, and drain their water towards the lake, which, despite a decrease in their influence because of evaporation, give the lake a positive hydrological balance.

Four droughts have occurred: in 1957, 1965, 1992 and 1996. The first two were natural but the latter two droughts were caused by man-made changes. Salt content depends on the climate and, above all, rainfall, which is greatest during September and October and lowest in winter. Water level fluctuates depending on the season and is highest in winter, then gradually drops beginning in the spring, reaching its lowest level in summer. The depth of Lac des Oiseaux is never greater than two metres.

**Climate:** The climate at the lake is Mediterranean characterized by a wet season from September to April and a dry season from May until the end of August. Eighty per cent of the precipitation falls between October and April. Temperature varies considerably. January is the coldest month (9° C), and August is the hottest (28.8° C), while the average annual temperature is 18° C. As with all the El Kala region, the bio climate is sub humid with a warm winter and rainfall of more than 900 millimetres. The climate is considered to be tropical, and this explains the presence of plant species of tropical and subtropical origin. Humidity is a special parameter for this region, because of the presence of many lacustrine and marsh formations, dense plant cover and the closeness of the sea. These factors contribute to a constant humidity with a maximum in summer.

#### 15. Hydrological values:

Because of the retention of sediments and pollutants linked to the presence of extensive vegetation, especially helophytes, Lac des Oiseaux plays the role of biological filter because of the plants' roots and their power to absorb toxic substances. The slight runoff also makes it possible for sediment to gather at the bottom of the lake and regulate flood water, especially that from El Kebir Oued that drains the region.

#### 16. Ecological features:

The lake's vegetation is linked to the soil substrata, and the most important plant communities are the large helophytes. A wide band of *Scirpus lacustris* extends along the north and north-western shores. A large area of *Typha angustifolia* covers all the south-western edge of the lake. There are also mixed populations of *Scirpus lacustris*, often in islands. The small helophytes are represented by *Apium nodiflorum*, *Rumex conglomeratus* and *Scirpus palustris*. The hydrophytes are represented by floating species, such as *Lemna gibba* and *L. minor*, and fixed species, such as *Callitriche stagnalis*, *Miriophyllum verticillatum*, *Nymphaea alba* and *Potamogeton fluitans*.

There are solar and seasonal parameters that have an important influence on the composition of the plant cover. The study of the dynamics of the floristic composition of the plant cover during the annual cycle shows a large seasonal heterogeneity in the plant coverage. During the winter, the plant cover at the lake is very diversified. The western plain is dominated by *Bellis annua*, *B. repens*, *Brassica oleracea* and

*Ormenis praecox*, with a belt of *Paspalum distichum*. The northern plains are occupied chiefly by *Cynodon dactylon* and small areas of *Asphodelus aestivus*. In the east, there are areas of two Gramineae, *Cynodon dactylon* and *Paspalum distichum*, which dominate along with a belt of *Cotula coronopifolia* that links the spring with the lake. In the south, there is *Erodium malachoides* with scattered patches of *Brassica procumbens*. The southeast is invaded by *Asphodelus aestivus*, which occupies all the edge of the lake. There are large patches of *Nymphaea alba* concentrated in the water, in the north-western part. In the spring, with an increase in temperature, *Cynodon dactylon* invades all the area around the lake, and *Paspalum distichum* is limited to small areas. During this period, the water level drops, affecting the indigenous plants in the water areas.

In summer, because of the drop in water level, the lake is invaded by a large number of filamentous algae, and *Carlina racemosa* appears, covering all the southern parts along with *Carlina lanata*, *Eryngium barrelieri*, *Scolymus grandifolius* and *S. hispanicus*. In autumn, the vegetation changes very little, but the *Cynodon dactylon*, which is replaced by *Crypsis alopecuroides* disappears. The water is then invaded by *Cyperus fuscus*, *Echinochloa crispigalli*, *Myriophyllum spicatum* and *Sparganium erectum*.

#### 17. Noteworthy flora:

Two hundred plant species have been recorded around the lake, some of which are very rare; for example, *Bellis repens*, *Ludwiga palustris* and *Malcomia parviflora*. Other plants, such as *Alternanthera sessilis*, *Digitaria debilis*, *Echinochloa repens*, *Lippia nodiflora*, *Paspalum distichum* and *Polygonum senegalense*, are also very rare and are of tropical and subtropical origin. *Apium crassipes* is a species of Mediterranean origin considered to be very rare. *Butomus umbellatus* is a species in decline in Europe, which is in a niche in Lac des Oiseaux. It is found only at this site and in the Mekhada marshes. *Lemna gibba*, *Najas minor* and *Scirpus tabernaemontani* are also considered to be rare or exceptional species in Algeria and are not found at Lac Tonga or Lac Oubeira. An endemic species found here is *Rumex algeriensis*. Three species not reported by Quezel and Santa among the Algerian flora have been found in Lac des Oiseaux, namely *Asparagus officinalis*, *Cotula coronopifolia* and *Cyperus aristatus*.

#### 18. Outstanding fauna

Lac des Oiseaux is the nesting site for two very rare species: the white-headed duck (*Oxyura leucocephala*) and the ferruginous duck (*Aythya nyroca*), as well as the *poule sultane*, *foulque macroule*, *grèbe huppé*, *grèbe castagneux* and the *poule d'eau*. The white-headed duck is considered endangered at the global level, and its population is declining because of the effect of climate and human impact on its habitat. Many species visit the lake (see figure 3). Several species not listed in figure 3 are found here; for example the *tadorne casarca*, *spatule blanche*, *grand comoran*, *aigrette garzette*, *grande aigrette* and many waders that winter here.

Several authors (Blondel, 1967; Morgan, 1982; Samraoui, 1993) consider the lake to be rare because of the richness of its vegetation, bird life and the presence of many insects, such as Ephemeroptera, Trichoptera and odonates of which 23 species have

been identified. The odonates found here represent one third of all the species of odonates found in Algeria. Among the species, four are of tropical African origin: *Brachythemis leucostica*, *Diplacodes lefebvrii*, *Orthetrum chrysostigma* and *Trithemis annulata*. Many species of fish are found in the lake, including eel, catfish and mullet.

Figure 3: Survey of Anatidae and *foulques* at Lac des Oiseaux (1986-1998).

Species	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
<i>Canard colvert</i>	500	3	300	67	1668	111	6	25	156	60	97	102	9
<i>Sarcelle d'hiver</i>	3000	20	80	16	2	133	30	870	522	9	260	370	170
<i>Sarcelle d'été</i>	-	-	-	-	-	36	-	4	-	-	-	-	-
<i>Canard chapeau</i>	40	10	25	-	8	58	-	98	10	10	15	10	-
<i>Canard siffleur</i>	3000	-	290	58	5560	-	20	-	102	70	122	1960	120
<i>Canard pilet</i>	2000	-	50	20	135	-	1500	290	58	150	250	-	112
<i>Canard souchet</i>	7000	5	320	874	6668	87	1500	290	58	150	250	-	112
<i>Fuligule morillon</i>	-	50	30	43	57	47	36	4	4	-	28	-	2
<i>Fuligule milouin</i>	80	20	220	1610	16	19	150	13	19	75	570	82	22
<i>Fuligule nyroca</i>	100	-	2	9	4	-	-	-	4	-	2	-	2
<i>Tadome de belon</i>	-	-	-	-	-	-	36	-	-	49	33	7	-
<i>Erisimature à tête blanche</i>	32	78	3	90	13	51	28	82	17	53	2	-	164
<i>Oie cendrée</i>	10	-	-	184	270	-	5	-	-	-	-	-	-
Subtotal Anatidae	15,762	186	1320	2944	14401	543	1981	1388	892	476	1414	2650	601
<i>Foulque macroule</i>	2000	340	4520	330	177	-	150	235	50	18	540	15	295
TOTAL	17,762	526	5840	3274	14,578	543	2131	1623	942	489	1954	2665	896

#### 19. Social and cultural values:

Current use of the lake is limited to agriculture and grazing on the shores. The total herd varies from 100 head in winter to 400 head during low water, primarily sheep, cattle and a few goats and horses.

#### 20. Land tenure/ownership of:

At the site: The land at the site is public land belonging to the government and local communities (commune of Lac des Oiseaux).

In the surrounding area: The land around the lake is public, but a small part of the land is private and several are Arch land (ancestral system managed by the tribe).

#### 21. Current land use:

Spread over approximately 50 per cent of the fertile land throughout the communal land, the commune of Lac des Oiseaux is quite agricultural, being favoured by a temperate climate. In addition to the favourable conditions for farming, the commune offers large areas of pasture, which during the summer extend into the dried-up

marshes. The area devoted to farming represents 47.06 per cent of the total surface, namely 4042.16 hectares. The mountainous area, representing about 30 per cent of the land, is covered with dense vegetation of natural populations of oaks and eucalyptus plantations. Forest covers an area of 2961 hectares, 31.3 per cent of the communal land.

22. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land use and development projects:

The greatest current problem for management of the natural resources of El Kala ecosystem is the traditional conflict between the aspirations and needs of a rapidly growing population and conservation of the environment.

The greatest short-term threats affecting the lake's ecosystem are:

- (a) Intensification of agriculture, namely through cultivation of commercial species that require a lot of water, such as the groundnut and watermelon during the summer season;
- (b) Overgrazing of the lake's shores, especially after introduction of sheep into the grazing system, which threatens to limit the extent and diversity of the lake's flora;
- (c) Expansion of urbanization to the southern shores of the lake by the local inhabitants and the pollution of the lake by the village's sewage, which is not yet treated;
- (d) Installation of hydro-agricultural drains in 1992 led to harmful results on the flow of water to the lake and even led to the annual drying-up in the summer.

23. Conservation measures taken:

Lac des Oiseaux, located outside the protected area of El Kala National Park, has no special protection. Nonetheless, several attempts at protection that have been carried out in the past, notably through the installation twice of fencing on the southern shore limiting access. This measure was rejected by the local inhabitants and destroyed. This work was part of the management plan for El Kala National Park financed by the World Bank, providing for inclusion of Lac des Oiseaux in the protected area. In April 1998 under the same project—the Ramsar Small Grants Fund, legislation was passed by the wali d'El Tarf. This step was the first step toward its classification by executive decree as a nature reserve for birds. A pumping station was built in 1997 and completed in November 1998 by the water services in order to send wastewater from the village of Lac des Oiseaux to Oued El Kebir. It will be put into service after construction is completed.

24. Conservation measures proposed but not yet implemented:

If the lake is not integrated into El Kala National Park under the Global Environmental Facility for a management plan, the Direction Générale des Forêts will classify it as a nature reserve.

## 25. Current scientific research and facilities:

Two post-graduate theses at the University of Annaba on the rhythm of Anatidae: a Master's thesis on odonates and a Master's thesis on freshwater fish. A meteorological station with two water-level scales has been constructed.

## 26. Current conservation education:

Lac des Oiseaux benefited in 1998 from the Ramsar Small Grant Fund for conservation through an awareness and public education project. An extensive awareness campaign was carried out with schoolchildren for preparation of:

- A poster in Arabic and French for distribution throughout Algeria (11,000 copies);

- A brochure in Arabic and French (10,000 copies);

- A manual for children (10,000 copies);

- A documentary film that was shown on 2 February 1999 on national television on the occasion of World Wetlands Day;

- Several drawing competitions involving 320 schoolchildren from 12 schools.

## 27. Current recreation and tourism:

Aside from a football field on the southern shore, there are no other installations. However, the location of the lake along National Highway 44 makes this site a very busy place used by local inhabitants or travellers, but without major disturbances to the lake.

## 28. Jurisdiction:

The land at Lac des Oiseaux is public land under the jurisdiction of the government.

## 29. Management authority:

Conservation des forêts de la wilaya d'El Tarf in coordination with  
El Kala National Park  
El Tarf 36000  
Wilaya d'El Tarf

## 30. References: