

## REPORT

# THE OTTER IN AN ARID ZONE - LAKE JORF TORBA, SOUTHWEST ALGERIA: ECOLOGY, DIET AND BEHAVIOR

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**Abstract:** Global warming, anthropological activities, water pollution, integration of non-indigenous species, these factors profoundly influence the biodiversity of Lake Jorf Toba in southwestern Algeria. The environment is becoming more arid, with long heat waves and less precipitation. The conservation of endangered arid zone species is a big challenge, especially if we are talking about a semi-aquatic animal like the Eurasian otter (*Lutra lutra*). The study aims to evaluate the situation of otters in arid environments such as Lake Jorf Torba. Our data showed the existence of *Lutra lutra* in the lake, which is an index of food and shelter availability. The major otter forage was *Barbus antinorii*, *Hypophthalmichthys molitrix*, *Cyprinus carpio*, and some arthropods. The otter preferred a rocky shelter to protect itself from the wind, cold and high temperatures. Our observation confirms that the *Lutra lutra* has always existed in the lake, but during our tracking, we noticed the mortality of two otters. Otters in lake Jorf Torba are a small population, which needs to be protected, and a serious conservation approach should be adopted.

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**Keywords:** Lac Jorf Torba, Otter, *Lutra lutra*, Conservation, Biodiversity, Arid zone

## INTRODUCTION

The arid zones and the desert of Algeria are characterized by a hostile climate, very low precipitation, high temperature, and winds which can be strong; in these conditions, flora and fauna are restricted to number of species.

The Saharan flora is adapted to hostile conditions, and there are a few hundred families of plants in the south-west of Algeria belonging mainly to chamaephytes and therophytes (Guenai et al., 2019). Oases are the only places where the fauna can develop into a species-rich community, but it is often also a site of human gathering. Anthropogenic action has impacted the number of oases, which limits potential otter habitat. However, the construction of dams such as the Jorf-Torba dam, 40 km southwest of Bechar, provide water and offers a favorable environment for animals to settle, and a resting site for migratory birds.

The Jorf-Torba dam has become a unique artificial lake in the south-west region of Algeria. Its freshwater is supplied by Wadi Guir (from the Moroccan Atlas) and this allows colonization by water animals.

The Eurasian Otter *Lutra lutra* is categorised as Near Threatened, under the A2c criterion, on the IUCN Red List of Threatened Species (Roos et al, 2021). The first otter record from the arid lands in south-west Algeria was in Igli, south of Jorf-Torba, in 1966 (Dupuy, 1966), before the building of the Jorf-Torba dam. Another record comes from 2009 (Khetar et al., 2009).

This species has been documented in arid and semi-arid zones in Morocco and Tunisia (Macdonald and Mason, 1984), Syria (Jacques, 1998), Jordan (Karami et al., 2006), Iran (Mirzaei et al., 2010), and Iraq (Al-Sheikhly and Nader, 2013). Little information is available on the status of the otter and its environment in Algeria. Libois et al. (2015 *b*) studied the otters of Kala in the north of the country. The only study in the south is that of Khetar et al. (2010). The objective of the present study is to evaluate the status of the Eurasian Otter in Lake Jorf Torba, in the context of its environment in the lake.

## STUDY AREA



**Figure 1.** Aerial image of Jorf Torba Lake

The study was centered on a sector of the Jorf Torba Dam (reservoir) in the northwest of Algeria, 40 km west of Bechar: 31°25'46''N 2°40'11'' W (Fig. 1). Jorf Torba dam is an artificial lake that supports wetland fauna and flora (Fig. 2, 3). The dam receives its water mainly from Oued (=River) Guir; starting from the

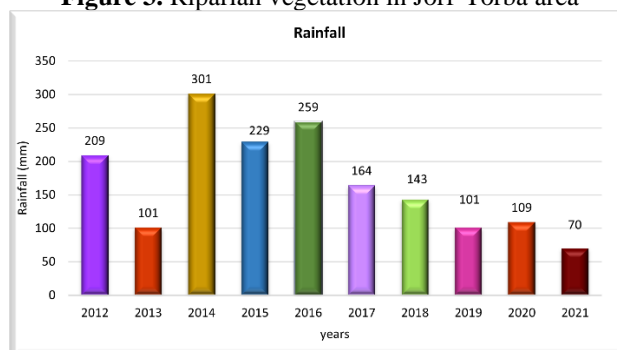
Moroccan Atlas, the Oued Guir runs for more than 600 km, passing through lake Jorf Toba, then joining the Oued Zouzfana north of Igli (south of province of Bechar around 250km from the Moroccan atlas), where together they form the Oued Saoura (Kabour et al., 2015). Lake Jorf Torba keeps ample water throughout the year. The Saharan zone is characterized by a high temperature which has a direct influence on the reservoir size. The heat period begins practically on the first of June, to extend until September (Coyne et Bellier, 1985). Temperatures are coolest between December and February. Annual rainfall at Jorf Torba was 9-49 mm (Mekkaoui, 2012), but it has decreased in the subsequent decade (Fig. 4).



**Figure 2.** Jorf Torba dam



**Figure 3.** Riparian vegetation in Jorf-Torba area



**Figure 4.** Frequency of rainfall in Bechar in the last decade (2012-2021)

The most abundant fish in Jorf Torba are *Barbus antinorii*, *Hypophthalmichthys molitrix* and *Cyprinus carpio*. Arthropods include the beetle *Blaps gigas*. These are eaten by the otter population of Lake Jorf Torba (Khetar et al., 2009, Nait-Larbi and Sellami 2011). The vegetation is mostly riparian, growths of *Ephedra alata*, *Tamarix* sp., *Launaea* sp., *Hammada* sp., and others (Table 1).

**Table 1:** Abundant plants species growing around the lake Jorf -Torba

Family	Species
Anacardiaceae	<i>Rhus tripartitae</i>
Rhamnaceae	<i>Ziziphus lotus</i>
Tamariaceae	<i>Tamarix articulata</i> / <i>Tamarix gallica</i>
Cistaceae	<i>Helianthemum lipii</i>
Chenopodiaceae	<i>Atriplex halimus</i>
Asteraceae	<i>Artemisia herba alba</i>
Brassicaceae	<i>Launea arbroscens</i>
	<i>Zilla mecroptera spinosa</i>
	<i>Anabasis aretioides</i>
Amaranthaceae	<i>Traganum nudatum</i>
	<i>Haloxyllum scoparium</i>
	<i>Anabasis aretioides</i>
Ephtedraceae	<i>Ephedra alata</i>
Euphorbaceae	<i>Euphorbia Guyoniana</i>
	<i>Ricinus communis</i>
Globulariaceae	<i>Globularia alypum</i>

### Survey

The observation of otters was focused on otter spraints and/or footprints. The presence of otters was tracked from Afar in Lake Jorf Torba in January 2020 and August 2021. During this period, the temperature was 3 °C higher than expected (December to February), when it should have been colder and frosty.

### RESULTS AND DISCUSSION

Combining records of footprints and observation of the animal, Lake Jorf Torba may hold about six otters (3 young otters were photographed, plus 1 male and 1 female and ± one more otter). Some otter activity is by night. All otters were close to the dam (Fig. 5), where the otter’s shelters were detected in rocky spaces (Fig. 6, 7), a refuge from the wind, cold, and heat. This observation corroborates other studies such as Kruuk (2006), which mentioned otters can use cavities as shelter.



**figure 5.** Distribution of otters in Lake Jorf Torba (province Bechar): Blue points represent the occurrence of otters.



**Figure 6.** The Otter (*Lutra lutra*) in Lake Jorf Torba January 2021



**Figure 7.** The otters in lake Jorf Torba; A) Otter in rock shelter (January 2021); B) Otter at lake shore 08 August 2021; C) Footprint of otters in Jorf Torba area; D) An otter found dead.

In addition to Lake Jorf Torba, the otter can be found in two other sites: The Abdala dam is 80 km and Igli (Oued zouzfana) is 150 km south of Bechar, where they have been reported by witnesses for years (pers. comm.). However, flooding is getting scarcer than usual. Droughts are becoming more frequent, and the level of the water in Lake Jorf Torba is seriously decreasing. On 15 July 2022, the authorities declared that

the dam is completely unusable (Fig. 8). Dams upstream on the Oued Guir and Oued Zouzfana, the source of Lake Jorf Torba, reduce water supply to Jorf Torba, and may threaten the existence of the Eurasian Otter and the lake's wetland ecosystem. Such dams include Kaddoussa dam, Douisse dam, Oued Zelmou dam and Kheng Alhalouf dam in Morocco.



**Figure 8.** Situation of drought in lake Jorf Torba (15<sup>th</sup> July 2022)

Human persecution is also an issue for this population of the Eurasian otter. Otters have been taken by traps in the southwest but people do not use the animal's fur.

Consideration has to be given to list Lake Jorf Torba as a wetland site of international importance under the Ramsar convention, to conserve the ecosystem existing in this area, in collaboration with Moroccan ecologists.

**Conflict of Interest:** The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## RESUMÉ

### LA LOUTRE EN ZONE ARIDE, LAC JORF TORBA AU SUD-OUEST DE L'ALGÉRIE: ÉCOLOGIE, ALIMENTATION ET COMPORTEMENT

Le réchauffement climatique, l'activités anthropologiques, pollution de l'eau, et l'intégration d'espèces non autochtone, Tout ces facteurs influencent profondément la biodiversité du lac Jorf Toba dans le Sud-Ouest de l'Algérie, l'environnement devient plus aride, de longues vagues de chaleur et moins de précipitations. La conservation des espèces menacées dans les zones arides est un grand défi, surtout s'il s'agit d'un animal semi-aquatique comme la loutre Loutre eurasiennne *Lutra lutra* à Jorf Torba. L'étude vise à évaluer la situation des loutres dans un environnement aride tels que le lac Jorf Torba. Nos données ont montré l'existence de *Lutra lutra* dans le sud-ouest de l'Algérie dans le lac Jorf Torba, qui est un indice de disponibilité de nourriture et d'abris. Le principal fourrage de la loutre était *Barbus antinorii*, *Hypophthalmichthys molitrix*, *Cyprinus carpio* et certains arthropodes. La loutre préfère un abri rocheux pour se protéger du vent, du froid et des températures élevées. Notre observation confirme que *Lutra lutra* a toujours existé dans le lac, mais lors de notre repérage, nous avons

récupéré deux corps de loutres. La loutre dans le lac de Jorf Torba est une petite population qu'il faut la protéger et adopter une approche de conservation sérieuse.

## RESUMEN

### LA NUTRIA EN EL LAGO JORF TORBA, DE LA ZONA ÁRIDA DEL SUDOESTE DE ARGELIA: ECOLOGÍA, DIETA Y COMPORTAMIENTO

El calentamiento global, las actividades antrópicas, la contaminación del agua, la integración de especies no-nativas, todos éstos factores influyen profundamente sobre la biodiversidad del Lago Jorf Torba, en el sudoeste de Argelia; el ambiente se torna más árido, con largas oleadas de calor y menos precipitación. La conservación de especies amenazadas en las zonas áridas es un gran desafío, especialmente si estamos hablando de un animal semi-acuático como la nutria Eurasiática *Lutra lutra* en Jorf Torba. El estudio está dirigido a evaluar la situación de las nutrias en ambientes áridos como el Lago Jorf Torba. Nuestros datos mostraron la existencia de *Lutra lutra* en el sudoeste de Argelia, Lago Jorf Torba, lo que indica que hay disponibilidad de alimento y refugio. Los principales alimentos de la nutria fueron *Barbus antinorii*, *Hypophthalmichthys molitrix*, *Cyprinus carpio*, y algunos artrópodos. La nutria prefirió refugios rocosos para protegerse del viento, el frío y las altas temperaturas. Nuestra observación confirma que *Lutra lutra* siempre ha existido en el lago, pero durante nuestro seguimiento, notamos la mortalidad de dos nutrias. La nutria en el lago Jorf Torba tiene una población pequeña, que necesita ser protegida, y debería adoptarse un enfoque serio de conservación.

## ملخص

الاحتباس الحراري، الأنشطة الإنسانية، تلوث المياه، تكامل في وجود أنواع حيوانية المهاجرة، تؤثر هذه العوامل بعمق على التنوع البيولوجي لبحيرة الجرف تربة في الجنوب الغربي للجزائر، وأصبحت البيئة أكثر جفافاً، وموجات حر طويلة المدة، وقلة هطول الأمطار. يعتبر الحفاظ على الأنواع المهددة من الانقراض في المنطقة الصحراوية تحدياً كبيراً، خاصةً إذا كان حيواناً شبيه مائي مثل ثعالب الماء الأوراسي "*Lutra lutra*" في بحيرة جرف التربة. تهدف الدراسة إلى تقييم حالة ثعالب الماء في البيئة الجافة مثل بحيرة جرف التربة. أظهرت بياناتنا وجود *Lutra lutra* في الجنوب الغربي للجزائر في بحيرة الجرف تربة، وهو مؤشر لتوفر الغذاء والمأوى. و يتمثل غذائها بـ *Barbus antinorii* و *Hypophthalmichthys molitrix* و *Cyprinus carpio* وبعض المفصليات. يفضل ثعالب الماء المأوى الصخري للحماية من الرياح والبرد ودرجات الحرارة المرتفعة. تؤكد ملاحظتنا أن *Lutra lutra* كانت موجودة دائماً في البحيرة، ولكن أثناء الدراسة الذي أجريناها، لاحظنا وجود جثتين من ثعالب الماء. ثعالب الماء في بحيرة جرف التربة هي مجموعة صغيرة تحتاج إلى الحماية وهناك حاجة ملحة إلى إستراتيجية ناجعة للحفاظ عليها.