



TECHNICAL REPORT

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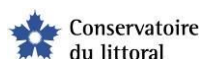
Report on restoration and extension of Lake Jeliana islet

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CONTEXT

L'Initiative pour les Petites Iles de Méditerranée

Depuis 2006, le Conservatoire du littoral coordonne un programme international de promotion et d'assistance à la gestion des micro-espaces insulaires méditerranéens, baptisé Initiative PIM pour les Petites Iles de Méditerranée, co-financé par le Fonds Français pour l'Environnement Mondial (FFEM), l'Agence de l'Eau Rhône Méditerranée-Corse et la Ville de Marseille. L'Initiative PIM développe un dispositif d'échange et de partage des connaissances nécessaires à l'émergence de bonnes pratiques de gestion sur des espaces exceptionnels.

SUMMARY

1. INTRODUCTION.....	3
2. LAKE JELIANA	3
3. THE RESTAURATION OF THE ISLET	5
4. SUMMARY OF RESULTS	6
5. FOLLOW UP STEPS	6
6. ACKNOWLEDGEMENTS	6
7. REFERENCES	7
7. ANNEXES - PHOTOS	7

1. INTRODUCTION

Libya is a contracting party to many international environmental conventions. It has ratified on many of those that relating to the protection of biodiversity, including the Convention on Biological Diversity (CBD), the Convention on the protection of migratory species (CMS), and the agreement of African Eurasian Waterbird Agreement (AEWA). The Environment General Authority (EGA) is the national contact point (focal-point) of these conventions.

EGA has initiated the census of wintering waterbirds in January 2005 after the adoption of a National Action Plan for the Protection of Birds in Libya in 2003 in collaboration with the Regional Activity Centre for Specially Protected Areas (RAC/SPA). This centre coordinates the implementation of Mediterranean Action Plan for Seabirds under the protocol on specially protected areas in the Mediterranean including the Annex II of the threatened and endangered species. The list includes 15 species of seabirds; one of them is the Mediterranean breeding population lesser crested tern *Sterna bengalensis emigrate*, which solely breeds at some sites in the eastern part of Libyan coastline.

Libyan Society for Birds LBS is a recently formed non-governmental organization, which aims to study, document and protect bird species in Libya and their habitats. The organization has established mainly by enthusiast people in birds, working in different jobs, at EGA, University, Private, Oil sector and students. The society is still at its first few months after establishment in late 2011, and has a good network of connections with other NGOs at the North African region.

There is also some other regional initiatives to protect the habitats where seabirds and other forms of life occurs in the Mediterranean region. The Mediterranean small islands initiative (PIM) was established and funded by the conservatoire de littoral of France, to establish better understanding of the biodiversity and status of about 3000 small islands throughout the Mediterranean. Moreover, one of PIMs programs is Project Albatros concerning the study of seabirds and their habitats, and attempt to restore their breeding sites.

However, this report presents a restoration action made to enhance the quality of breeding habitat at Jeliana Lake islet. It is the last discovered breeding site for lesser crested terns in Libya and the Mediterranean. The work was conducted during the period from 5-7.04.2012. Sand and gravel sacs were carried to the islet in order to increase its surface space and to raise its level to avoid nest inundation, which was the cause nesting failure of lesser crested tern in 2010 and 2011. The work was conducted by the members of Libyan Birds Society (LBS), volunteers and coordinated by Natural conservation department (EGA).

2. LAKE JELIANA

2.1 LOCATION AND IMPORTANCE

Lake Jeliana is located at the western entrance of Benghazi city centre, southwest to the port of Benghazi, and represents the western part of Benghazi Lake. The latter includes the harbor and a man-made lake of less than 200 hectares surrounded by reeds and Tamarix. The area located between the north and south main roads of Benghazi. The site is a home of the largest number of bird species in Libya particularly waterbirds (41 species, winter census 2005 - 2102). Furthermore, it is considered as one of the aesthetic features of the city, and previously (before 17 Feb. revolution) it has been targeted to be developed without considering of any Environmental Impact Assessments for the project and it is influence on natural habitats and species occurs in or inhabit the area.

2.2 HISTORICAL IMPORTANCE

The local communities at the area of Jeliana have had practiced salt extraction as one of the oldest traditional economic activities in Benghazi until the middle of the last century (Fig.1). Moreover, it was the site of first landing of Italian forces to Benghazi, where a famous battle occurred in 1911.

From an archaeological perspective, it is believed that the small islet located in the center of the lake, where the base of the Statue of Venus temple during the Hellenistic era, and then the lake was called Lake Tritons. It was used as natural harbor for fishing boats during the ancient history.



Figure 1: Salt produced from Jeliana stocked at Benghazi port.



Figure 2:
Statue of Venus Benghazi exists today
in the Museum of the University of Pennsylvania
<http://www.upenn.edu/gazette/0503/museum2.html>

2.3 SCIENTIFIC IMPORTANCE

Lake Jeliana is one of the best places in Libya to watch a variety of resident and migratory birds during winter. More than 30% of the birds wintering in Libya have been observed in Jeliana (Table.1). However, the location at the vicinity of Benghazi city centre making this site of great potential for bird watching and other environmental activities, especially for youth and students who intended to learn bird watching.

Table (1) Results of one hour effort of Bird watching in Jeliana 29/1/2010

No.	water birds species	number	No.	water birds species	number
1	Black Tern <i>Chlidonias niger</i>	1	24	Pochard <i>Aythya ferina</i>	107
2	Black-headed Gull <i>Larus ridibundus</i>	1719	25	Redshank <i>Tringa totanus</i>	13
3	Black-necked Grebe <i>Podiceps nigricollis</i>	1	26	Ringed Plover <i>Charadrius hiaticula</i>	28
4	Black-winged Stilt <i>Himantopus himantopus</i>	23	27	Ruff <i>Philomachus pugnax</i>	14
5	Common Sandpiper <i>Actitis hypoleucos</i>	3	28	Shoveler <i>Anas clypeata</i>	450
6	Coot <i>Fulica atra</i>	53	29	Slender-billed Gull <i>Larus genei</i>	12
7	Cormorant <i>Phalacrocorax carbo</i>	16	30	Snipe <i>Gallinago gallinago</i>	6
8	Dunlin <i>Calidris alpina</i>	295	31	Spoonbill <i>Platalea leucorodia</i>	2
9	Ferruginous Duck <i>Aythya nyroca</i>	1	32	Teal <i>Anas crecca</i>	1
10	Greater Flamingo <i>Phoenicopterus ruber</i>	72	33	Tufted Duck <i>Aythya fuligula</i>	1
11	Green sandpiper <i>Tringa ochropus</i>	3	34	Whiskered Tern <i>Chlidonias hybrida</i>	85
12	Grey Heron <i>Ardea cinerea</i>	9	Non- waterbird s
13	Kentish Plover <i>Charadrius alexandrinus</i>	178	36	Stonechat <i>Saxicola torquata</i>	5
14	Lesser Black-backed Gull <i>Larus fuscus</i>	2	37	White Wagtail <i>Motacilla alba</i>	3
15	Lesser crested Tern <i>Sterna bengalensis</i>	1	38	Bluethroat <i>Luscinia svecica</i>	1
16	Little Egret <i>Egretta garzetta</i>	1	39	Reed warbler <i>Acrocephalus sp</i>	5
17	Little Grebe <i>Tachybaptus ruficollis</i>	17	40	Reed Bunting <i>Emberiza schoeniclus</i>	10
18	Little Gull <i>Larus minutus</i>	3	41	Starling <i>Sturnus vulgaris</i>	1
19	Little Stint <i>Calidris minuta</i>	415	42	Laughing Dove <i>Streptopelia senegalensis</i>	5
20	Marsh Sandpiper <i>Tringa stagnatilis</i>	1	43	Chiffchaff <i>Phylloscopus collybita</i>	10
21	Mediterranean Gull <i>Larus melanocephalus</i>	4	44	Robin <i>Erithacus rubecula</i>	1
22	Moorhen <i>Gallinula chloropus</i>	34	45	Black Redstart <i>Phoenicurus ochruros</i>	1
23	Pintail <i>Anas acuta</i>	29	46	House Sparrow <i>Passer domesticus</i>	10

Within the Lake Jeliana, there is a small islet used by wintering birds as roosting site. In summer the islet used for breeding of lesser crested Tern *Sterna bengalensis* and little tern *Sterna albifrons* (both listed as an endangered species on Mediterranean level). Furthermore, some other species such as Black winged Stilt (*Himantopus himantopus*) and Kentish plover (*Charadrius alexandrinus*) are observed as resident breeders. Greater flamingos (*Phoenicopterus roseus*) are also using the area for feeding and as stopover during their migration. Therefore, it has been chosen as training site for bird census and identification during the training session held in Benghazi in 2010.

The lake also has fish diversity; including spawning fish that enters from the Sea via a small canal connects Jeliana to Lake Benghazi. Since more than 20 years the Lake suffers from mixing its water with sewage network due to the breakdown of treatment plant nearby Gowarsha locality. This poses the largest threat to the natural components of the area.

Public uses of the site:

1. Golf playing field in the north bank of the lake.
2. Walking and running course around the lake (recreational activities).
3. Some grazing and harvesting of reeds for livestock and traditional handcrafts.

3. THE RESTORATION OF THE ISLET

3.1 PLANNING AND SEEKING FOR FUND

As mentioned above, large quantities of wastewater enters the lake from sewage network, resulting in high water levels at the lake. This caused the failure of bird nests during the seasons 2008 and 2009. After a contractor started deepening the site as part of development project, water levels has steeply decreased. Consequently, the islet became connected to mainland by dry pass that help some stray dogs to enter. Sadly, a total of 125 nests of lesser crested terns were predated in summer 2010.

With the beginning of this year, the Environment General Authority (EGA) and the Libyan Birds Society LBS have prepared a plan to raise the level of the islet, in order to ensure avoidance of inundation of nests. However, a proposal was submitted to the PIM initiative on February 2012, seeking financial assistance to fund this work. PIM has signed an agreement with EGA to transfer the amount of €1500 to cover some expenses of the fieldwork, which was agreed to be conducted in partnership between EGA and LBS.

3.2 CONDUCTION OF THE WORKS

The Implementing of this work started by four filed visits to the site during March 2012, in order to make sure that there are no breeding birds in the site. Notes on water level changes were also documented, as well as calculating the needed amount of gravel and sand to raise the islet to the level of 30cm.

It was agreed with local team in Benghazi to carry sand and gravel in large plastic bags by using a small motorized fishing boat. A circle of sand/gravel filled bags were laid around the targeted area of the islet to break water currents towards the islet.

Work carried out during 5th - 7th April 2012, with the following action:

1. Collecting stones and gravel from the immersed parts around the islet.
2. Transfer of further about 18 tons of gravel from the lake banks and purchasing gravel no.1 used in construction.
3. Transfer of sand to cover the gravel base in the islet in order to make it suitable for nesting of terns and other species on the new habitat.

The following links are YouTube videos featuring the works:

1. <http://www.youtube.com/watch?v=fGgiCJywyto>
2. <http://www.youtube.com/watch?v=g3vaolHsG88&feature=relmfu>
3. <http://www.youtube.com/watch?v=Oku9pRVh45U&feature=relmfu>
4. <http://www.youtube.com/watch?v=g3vaolHsG88&feature=relmfu>

4. SUMMARY OF RESULTS

1. Raising the islet level to about 30 cm by using layer of gravel/ stones covered with a layer of sand
2. The covered area is estimated to 114 square meters.
3. Erecting of some metal poles (height 60cm) in and around the islet to be used for birds roosting. Moreover, it will be helpful for reading of rings from outside of the lake.
4. A total of 13 waterbirds species have been observed during the fieldwork (04/05/2012), as follows:

No.	Species	Number.
1	Black headed gull <i>Larus ridibundus</i>	43
2	Black tern <i>Chlidonias niger</i>	45
3	Black winged stilt <i>Himantopus himantopus</i>	17
4	Coot <i>Fulica atra</i>	33
5	Dunlin <i>Calidris alpina</i>	5
6	Great Cormorant <i>Phalacrocorax carbo</i>	6
7	Kentish plover <i>Charadrius alexandrinus</i>	17 + 2 Breeding at lake margins
8	Little Egret <i>Egretta garzetta</i>	7
9	Little Grebe <i>Tachybaptus ruficollis</i>	2
10	Little tern <i>Sterna albifrons</i>	2
11	Slender billed gull <i>Larus genei</i>	6
12	White wag tail <i>Motacilla alba</i>	3
13	Yellow wag tail <i>Motacilla flava</i>	13

5. FOLLOW UP STEPS

1. The success of this operation will be evaluated by the number of nests of lesser crested terns in this coming season in late May 2012.
2. Further work needed to ensure the proper management of the site, as well as urgent need to amend the plans for developing and deepening the lake. Otherwise, waders and other forms of birds and wildlife in the site will disappear.
3. Restoring the reed beds at the southern bank of the lake, being an important feeding and nesting habitats for many species of birds.
4. Planning of certain footpaths around the site to be used for public sports.
5. Maintain the golf course and encourage the golfers to be involved in managing process of the site.
6. Contact the local public authorities to ensure the proper management of the site and cleanup the solid waste around the edges of the lake.

6. ACKNOWLEDGEMENTS

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7. REFERENCES

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8. ANNEXES - PHOTOS



Google Earth general view of the Lake Jeliana



General view of Lake Jeliana before starting the development project



The lake after the development project start in 2010



The Islet in May 2009



Lesser crested tern nesting on the islet in 2009



The islet before restoration,
March 2012



The islet after restoration in April
2012