

Results of the eighth winter waterbird census in Libya in January 2012

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ABSTRACT

After sporadic observations and reports on Libyan birds during the last century, a regular census of wintering birds at Libyan coastal wetlands started in January 2005. Results of each winter census till 2011 have been published. The survey of 2012 was carried out by the authors of the present paper. The general aim was to continue the census of wintering waterbirds in Libya, despite the difficulties that faced the team after the War of Liberation, and the fact that certain areas, very important for birds, have been declared military areas. A total of 29,314 individuals belonging to 69 waterbird species was counted. Comparatively, the number of sites covered in 2012 was less than that in previous years of the survey. The majority of individuals counted belong to seven gull species. This survey also observed a total of 56 individuals of *Aythya nyroca* Guldenstadt, 1770, a Near Threatened species, as well as, for the first time, a single individual of Canada Goose *Branta canadensis* (Linnaeus, 1758) in eastern Libya.

KEY WORDS

Waterbirds; *Aythya nyroca*; Canada Goose; Libya.

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INTRODUCTION

After sporadic observations and reports of Libyan birds during the last century, a regular census of wintering birds at Libyan coastal wetlands started in January 2005. Results of each winter census till January 2011 have been published (e.g. Azafzaf et al., 2005, 2006; Etayeb et al., 2007; Hamza et al., 2008).

These field surveys resulted in the publication of the Atlas of Wintering Waterbirds of Libya 2005–2010. In addition, 2005 and 2006 results were published in Wildfowl (Smart et al., 2006) and recently, results of the seventh winter waterbird

census in Libya (January–February 2011) were published (Bourass et al., 2013).

The Environment General Authority (EGA), the official Libyan body responsible for the implementation of international agreements relating to biodiversity, co-sponsored the previous ornithological surveys of wetlands in Libya, under a Memorandum of Agreement with the RAC/SPA and AEWA, and with support from Wetlands International, the Istituto Nazionale per la Fauna Selvatica INFS (Italy) and the Office National de la Chasse et de la Faune Sauvage ONCFS (France).

The survey of 2012 was carried out by the authors of the present paper. The general aim was to continue the census of wintering waterbirds in Libya, despite the difficulties that faced the team after the War of Liberation and the declaration of certain very important areas for birds as military areas. The study also aimed to compare the present results with the previous results (2005–2011) and to report on whether there were records of any new species.

MATERIAL AND METHODS

The survey was principally focused on the far eastern and western regions, and very few sites in the middle region of the country were covered (Fig. 1). A total of 42 sites was covered (Table 1); the survey was carried out in two periods, 3rd–8th Jan and 22nd–31st Jan. Moreover, unlike previous years, the survey of 2012 excluded some important bird sites, because of their declaration as military sites during the Libyan War of Liberation.

Unfortunately, there was no access to the Tawergha complex (Qaser Ahmed, Tawergha Spring and Al Hisha; 32°00'12,9" N; 15°08'41,9" E) one of the most important sites for waterbirds, where numerous species and individuals were observed in previous years (2005–2011). In order to examine the population trend of waterbirds wintering in Libya from 2005 to 2012, the Living Planet

Index (LPI) was used. The use of LPI was started in 1997 by the World Wide Fund for Nature (WWF) to investigate the changes of global biodiversity over time, especially for measuring the average trends of vertebrate populations (Loh et al., 2005).

In this paper, the Chain method was used to calculate the index, where the logarithm of the ratio of the population of each pair of years was calculated using the formula:

$$d_t = \log(N_t/N_{t-1})$$

where N_t = population size and t = years (time). The specific values of d_t were generated for n_t as:

$$d_t = \frac{1}{n_t} \sum_{i=1}^{n_t} d_{it}$$

Finally, the index for waterbird populations in Libyan wetlands in a standard year t was calculated as:

$$I_t = I_{t-1} 10^{d_t}$$

RESULTS AND DISCUSSION

The overall number of species and individuals of waterbirds and non-waterbirds was lower than



Figure 1. Sites included in the winter census in January 2012.

S.n	site name	N	E
1	Ajdabiyah GMMR reservoir	30.58	20.34694
2	Ajdabiyah sewage farm	30.69472	20.25889
3	Al Labadia	32.50472	20.89306
4	Al Mallahah	32.89972	13.28694
5	Al Maqarin karstic lakes	32.15917	20.13861
6	Assabri beach	32.13667	20.07278
7	Ayn Taqnit	32.125	12.80722
8	Ayn Zayyanah	32.21389	20.15556
9	Bab al Bahr coast	32.89667	13.16417
10	Benghazi harbours	32.10472	20.05778
11	Bin Jawwad dam	30.80028	18.06694
12	Bou Dzira	32.16833	20.13194
13	Coast Abu Kammash to Ras Ajdir	33.11139	11.63639
14	Farwah Lagoon	33.08806	11.76028
15	Sabkhat Abu Kammash	33.08389	11.59389
16	Sabkhat al Kuz	32.44083	20.43333
17	Sabkhat al Manqub	32.90944	12.12639
18	Sabkhat al Thama and Sabkhat Esselawi	32.14944	20.10278
19	Sabkhat ash Shuwayrib	30.72361	20.12972
20	Sabkhat at Tamimi	32.35917	23.07528
21	Sabkhat Ayn ash Shaqiqah	32.81444	21.47972
22	Sabkhat Ayn az Zarqa	32.80444	21.45917
23	Sabkhat Fairuz	32.04333	20.02222
24	Sabkhat Julyanah	32.09028	20.05944
25	Sabkhat Karkurah	31.40111	20.055
26	Sabkhat Millitah	32.83083	12.28278
27	Sabkhat Qaminis and Sabkhat Jaruthah	31.74528	19.93444
28	Sabkhat Qanfudhah	32.00028	19.98861
29	Sabkhat Ras at Tin	32.60917	23.12222
30	Sea off Farwah Island	33.11639	11.74861
31	Tajura coast	32.89583	13.37
32	Tobruk harbour	32.06861	23.98583
33	Tripoli harbour	32.90167	13.19194
34	Umm al Jarami	32.52444	23.09361
35	Wadi al Mujaynin dam	32.29	13.2525
36	Wadi al Qusaybat and Ain al Wahsh	32.31639	23.09694
37	Wadi at Tut dam	32.11722	12.42083
38	Wadi Ghan dam	32.23778	13.13083
39	Wadi Ka'am dam	32.39667	14.32917
40	Wadi Ka'am mouth	32.52667	14.44639
41	Wadi Zaret dam	32.10611	12.80333
42	Zuwarah harbour	32.92306	12.12139

that in all years between 2005 and 2011, as well as the number of sites covered (Table 2). A total of 29,314 individuals belonging to 69 species from 20 families of waterbirds and wetland-dependent raptors was recorded during January 2012 (Table 3). This survey was mainly focused on the eastern and western regions, but included some sites in the middle region of the country.

The population index of wintering waterbirds in Libya showed fluctuations throughout the years of census (2005–2012), with peaks of up to more than 50% in January of 2006, 2008 and 2010 (Fig. 2). Furthermore, the Living Planet Index showed a population decline in January 2012 of up to 0.3% for the above mentioned reasons.

Family PODICIPEDIDAE

Three species from this family were counted: Black-necked Grebe *Podiceps nigricollis*, Little Grebe *Tachybaptus ruficollis* and Great Crested Grebe *Podiceps cristatus* (Table 3). These species were reported in the previous surveys from 2005 to 2011 (Azafzaf et al., 2005, 2006; Etayeb et al., 2007; Hamza et al., 2008; Bourass et al., 2013). The largest number was of the Black-necked Grebe with a total of 495 individuals.

Family PROCELLARIIDAE

A total of fourteen Yelkouan Shearwater *Puffinus yelkouan* was counted during this survey. Since the start of wintering survey in 2005, Yelkouan Shearwater was only observed in winters 2005 (EGA-RAC/SPA Waterbird Census Team, 2012), and 2011 with a total of five individuals (Bourass et al., 2013).

Family SULIDAE

Six individuals of Gannet *Morus bassanus* were observed in winter 2012 (four in Wadi Ka'am, one at Tajura Coast and one at Farwah Island). The number of Gannets ranged from 3 to 40 individuals during the previous surveys 2005–2011, and the peak was in January 2011.

Table 1. Number of sites covered in January 2012, Libya.

Years	2005	2006	2007	2008	2009	2010	2011	2012
No. WB	29,996	51,698	39,303	53,632	40,369	51,652	34,842	29,314
No. WB sp.	79	85	92	79	65	86	81	69
No. NWB	301,60	146,621	39,130	13,378	13,047	60,000	506,155	2,054
No. NWB sp.	74	60	69	64	55	60	67	23
Covered sites	65	56	43	50	49	94	84	42
Period of census	3–17 Jan	19–31 Jan	3–15 Feb	20–31 Jan	26 Jan–7 Feb	24 Jan–3 Feb	29 Jan–13 Feb	3–8 Jan, 22 Jan–1 Feb

Table 2. Numbers of birds (species and individuals) counted during winters 2005 to 2012, Libya. WB=Waterbirds, NWB= Non-Waterbirds

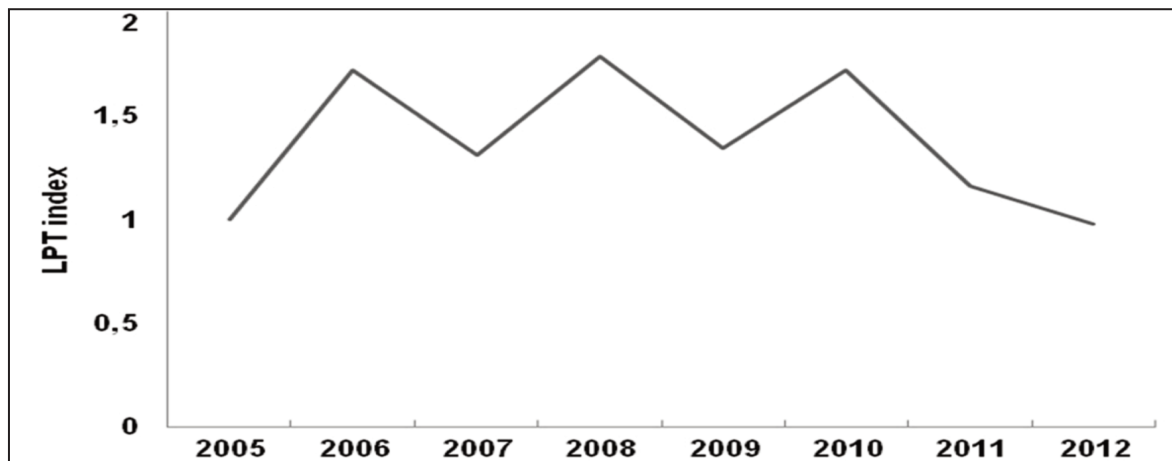


Figure 2. The index of waterbird populations wintering in Libyan wetlands from 2005 to 2012.

Family PHALACROCORACIDAE

In January 2012 this family was represented only by the Cormorant *Phalacrocorax carbo*, with a total of 1357 individuals counted in 25 different sites. The highest numbers were observed in Wadi Ka'am and Farwah Lagoon (313 and 236, respectively). Since winter 2005 the total has ranged from 987 to 2606, with a peak in 2010 (EGA-RAC/SPA Waterbird Census Team, 2012).

Family ARDEIDAE

Five species belonging to this family were observed during the current survey: Cattle Egret,

Squacco Heron, Little Egret, Great Egret and Grey Heron (Table 3). The highest number was of Cattle Egret, with a total of 611 individuals, and the lowest of Squacco Heron where only two individuals were observed in Wadi Ka'am. However, from 2005 to 2010 the number of Squacco Heron ranged from 2 to 5 (EGA-RAC/SPA Waterbird Census Team, 2012). Relatively, the numbers of the other species of this family were at the same levels for the years 2005 to 2011 (Bourass et al., 2013; EGA-RAC/SPA Waterbird Census Team, 2012).

Family CICONIDAE

Five individuals of White Stork *Ciconia ciconia*

were counted in Al Labadia in eastern Libya (Table 1). Bourass et al. (2013) reported a total of 86 individuals in winter 2011. From 2005 to 2010 numbers ranged from 4 to 50 (EGA-RAC/SPA Waterbird Census Team, 2012). However, White Storks are more common in farmland than in coastal wetlands (Bundy, 1976).

Family THRESKIORNITHIDAE

The current survey counted 61 Eurasian Spoonbills *Platalea leucorodia*, the lowest total so far; the peak was in 2011 with a total of 145 individuals (Bourass et al., 2013).

Family PHOENICOPTERIDAE

A total of 219 individuals of Greater Flamingo *Phoenicopus roseus* was counted in six sites (Al Mallahah, Sabkhat Millitah, Sabkhat Abu Kamash, Sabkhat Qanfudhah, Sabkhat al Kuz and Farwah Lagoon). This observation is the lowest among the years from 2005 to 2011. Moreover, the highest number of Flamingos was observed in 2009 with a total of 3292 individuals (EGA-RAC/SPA Waterbird Census Team, 2012).

Family ANATIDAE

A total of 11 species belonging to this family was observed in this survey (Table 3). The highest numbers were of Shoveler *Anas clypeata* and Teal *Anas crecca*, with totals of 747 and 394 individuals, respectively. Other species of the family Anatidae numbered from 1 to 193 (Table 3). However, individual numbers of these species were the lowest recorded, in comparison to the numbers in previous surveys (2005–2011). Unexpectedly, during counting of birds in Al Labadia on 29th Jan 2012, members of the census team observed an individual of Canada Goose *Branta canadensis* with a flock of 177 Shoveler, seven Pintail *Anas acuta* and four individuals of Ferruginous Duck *Aythya nyroca*.

This is the first record of this species in Libya, although two other species of geese have been reported in Libya: White-fronted Goose *Anser albifrons* (Bundy, 1976) and Greylag Goose *Anser anser* (Bundy, 1976; EGA-RAC/SPA Waterbird Census Team, 2012). Description of Canada Goose: Larger than all species of duck, long neck, brownish body, black head and neck and white patches on the

face. This observation was in early morning. The team was able to observe this species at a distance of 100–120 m for more than one hour, using Swarovski Telescope and Svensson et al. (2010) guide.

Family PANDIONIDAE and ACCIPITRIDAE

A total of 20 Marsh Harriers *Circus aeruginosus* was observed in different wetlands along the coastline and inland. This observation is the lowest so far as the range was 21–74 individuals from 2005 to 2011 (EGA-RAC/SPA Waterbird Census Team, 2012; Bourass et al., 2013). Although it is mentioned as a winter and passage visitor (Bundy, 1976), and there is no evidence of breeding, our observations from field visits to different sites in Libya recorded the presence of Marsh Harrier in all months of the year. Furthermore, this species is reported as a resident breeder in Tunisia which is the neighbouring country to Libya (Isenmann et al., 2005). A solitary Osprey *Pandion haliaetus* has been observed during winter 2012 in Tajura Coast. However, a total of four individuals was observed in 2005 (Smart et al., 2006) and only one in 2008 (Hamza et al., 2008) and 2010 (EGA-RAC/SPA Waterbird Census Team, 2012). The Osprey is reported as a winter and passage visitor in Libya (Bundy, 1976).

Family RALLIDAE

Unlike previous years, Moorhen *Gallinula chloropus* was counted at only three sites (Al Mallahah, Wadi Ka'am and Al Labadia), with a total of 297 individuals (Table 3). However, this number was in the range of Moorhens (38–701) counted during the previous years 2005–2011; the peak was in 2009 (EGA-RAC/SPA Waterbird Census Team, 2012). Coot *Fulica atra* was observed in 13 sites, mostly freshwater wetlands. The total of 901 individuals is the highest among the previous winter surveys where the range was 211–763.

Family HAEMATOPODIDAE

A total of 22 Eurasian Oystercatcher *Haematopus ostralegus* was recorded, as usual, at the westernmost wetlands on the Libyan coastline. The previous annual maximum was 56 in 2011 (Bourass et al., 2013).

Family	Scientific name	Common name	Total
ANATIDAE	<i>Branta canadensis</i> (Linnaeus, 1758)	Canada Goose	1
	<i>Tadorna tadorna</i> (Linnaeus, 1758)	Shelduck	64
	<i>Anas platyrhynchos</i> Linnaeus, 1758	Mallard	26
	<i>Anas strepera</i> (Linnaeus, 1758)	Gadwall	1
	<i>Anas acuta</i> Linnaeus, 1758	Pintail	63
	<i>Anas clypeata</i> Linnaeus, 1758	Shoveler	747
	<i>Marmaronetta angustirostris</i> (Ménétriés, 1832)	Marbled Duck	10
	<i>Anas crecca</i> Linnaeus, 1758	Teal	394
	<i>Aythya ferina</i> (Linnaeus, 1758)	Pochard	193
	<i>Aythya nyroca</i> Guldenstadt, 1770	Ferruginous Duck	56
	<i>Anas</i> sp.	Duck sp.	22
PROCELLARIIDAE	<i>Puffinus yelkouan</i> Acerbi, 1827	Yelkouan Shearwater	14
SULIDAE	<i>Morus bassanus</i> Linnaeus, 1758	Gannet	6
PHALACROCORACIDAE	<i>Phalacrocorax carbo</i> (Linnaeus, 1758)	Cormorant	1357
ARDEIDAE	<i>Bubulcus ibis</i> Linnaeus, 1758	Cattle Egret	611
	<i>Ardeola ralloides</i> Scopoli, 1769	Squacco Heron	2
	<i>Egretta garzetta</i> (Linnaeus, 1776)	Little Egret	116
	<i>Casmerodius albus</i> (Linnaeus, 1758)	Great Egret	19
	<i>Ardea cinerea</i> Linnaeus, 1758	Grey Heron	83
CICONIDAE	<i>Ciconia ciconia</i> Linnaeus, 1758	White Stork	5
THRESKIORNITHIDAE	<i>Platalea leucorodia</i> Linnaeus, 1758	Spoonbill	61
PHOENICOPTERIDAE	<i>Phoenicopterus roseus</i> Pallas, 1811	Flamingo	219
PODICIPEDIDAE	<i>Podiceps nigricollis</i> Brehm, 1831	Black-necked Grebe	495
	<i>Tachybaptus ruficollis</i> (Pallas, 1764)	Little Grebe	88
	<i>Podiceps cristatus</i> Linnaeus, 1758	Great Crested Grebe	82
ACCIPITRIDAE	<i>Circus aeruginosus</i> Linnaeus, 1758	Marsh Harrier	20
PANDIONIDAE	<i>Pandion haliaetus</i> (Linnaeus, 1758)	Osprey	1
RALLIDAE	<i>Gallinula chloropus</i> (Linnaeus, 1758)	Moorhen	297
	<i>Fulica atra</i> Linnaeus, 1758	Coot	901
HAEMATOPODIDAE	<i>Haematopus ostralegus</i> Linnaeus, 1758	Oystercatcher	22
RECURVIROSTRIDAE	<i>Himantopus himantopus</i> Linnaeus, 1758	Black-winged Stilt	550
	<i>Recurvirostra avosetta</i> Linnaeus, 1758	Avocet	8
BURHINIDAE	<i>Burhinus oedicnemus</i> Linnaeus, 1758	Stone Curlew	35
CHARADRIIDAE	<i>Charadrius hiaticula</i> Linnaeus, 1758	Ringed Plover	61

Table 3. Number of waterbird species and individuals counted in January 2012, Libya (continued).

Family	Scientific name	Common name	Total
CHARADRIIDAE	<i>Charadrius alexandrinus</i> Linnaeus, 1758	Kentish Plover	339
	<i>Pluvialis squatarola</i> Linnaeus, 1758	Grey Plover	44
	<i>Pluvialis apricaria</i> Linnaeus, 1758	Golden Plover	430
	<i>Vanellus vanellus</i> Linnaeus, 1758	Lapwing	263
SCOLOPACIDAE	<i>Calidris alba</i> Pallas, 1764	Sanderling	12
	<i>Arenaria interpres</i> (Linnaeus, 1758)	Turnstone	27
	<i>Calidris alpina</i> Linnaeus, 1758	Dunlin	1781
	<i>Calidris ferruginea</i> Pontoppidan, 1763	Curlew Sandpiper	3
	<i>Calidris minuta</i> Leisler, 1812	Little Stint	231
	<i>Tringa glareola</i> Linnaeus, 1758	Wood Sandpiper	8
	<i>Tringa ochropus</i> Linnaeus, 1758	Green Sandpiper	16
	<i>Actitis hypoleucos</i> Linnaeus, 1758	Common Sandpiper	22
	<i>Tringa totanus</i> Linnaeus, 1758	Redshank	696
	<i>Tringa erythropus</i> Pallas, 1764	Spotted Redshank	66
	<i>Tringa nebularia</i> Gunnerus, 1767	Greenshank	68
	<i>Tringa stagnatilis</i> Bechstein, 1803	Marsh Sandpiper	34
	<i>Limosa limosa</i> Linnaeus, 1758	Black-tailed Godwit	3
	<i>Limosa lapponica</i> Linnaeus, 1758	Bar-tailed Godwit	2
	<i>Numenius arquata</i> Linnaeus, 1758	Curlew	340
	<i>Numenius phaeopus</i> Linnaeus, 1758	Whimbrel	1
		<i>Gallinago gallinago</i> Linnaeus, 1758	Snipe
	<i>Philomachus pugnax</i> Linnaeus, 1758	Ruff	13
LARIDAE	<i>Chroicocephalus ridibundus</i> Linnaeus, 1776	Black-headed Gull	11981
	<i>Chroicocephalus genei</i> Breme, 1839	Slender-billed Gull	804
	<i>Larus melanocephalus</i> Temminck, 1820	Mediterranean Gull	1035
	<i>Larus argentatus</i> Pontoppidan, 1763	Herring Gull	31
	<i>Larus michahellis</i> Naumann, 1840	Yellow-legged Gull	1398
	<i>Larus audouinii</i> Payraudeau, 1826	Audouin's Gull	87
	<i>Larus fuscus</i> Linnaeus, 1758	Lesser Black-backed Gull	2374
	<i>Larus</i> sp.	Gull sp.	9
STERNIDAE	<i>Sterna sandvicensis</i> Latham, 1787	Sandwich Tern	362
	<i>Hydroprogne caspia</i> Pallas, 1770	Caspian Tern	40
	<i>Sterna bengalensis</i> Lesson, 1821	Lesser Crested Tern	1
	<i>Chlidonias hybridus</i> Pallas, 1811	Whiskered Tern	43

Table 3 (continued). Number of waterbird species and individuals counted in January 2012, Libya.

Family RECURVIROSTRIDAE

At eight Libyan coastal wetlands, 550 Black-winged Stilts *Himantopus himantopus* were counted (previous maximum 753 in 2011). This species is mentioned as a passage visitor (Bundy, 1976), but recently has been recorded as a breeder at Al Mallahah wetland (Etayeb et al., 2013). A total of eight Avocets *Recurvirostra avosetta* was observed in two sites in eastern Libya (Al Labadia and Ayn Zayyanah). The previous annual maximum was 193 in 2006 (EGA-RAC/SPA Waterbird Census Team, 2012).

Family BURHINIDAE

Eurasian Stone Curlew *Burhinus oediconemus* was counted in two sites: Wadi Ka'am dam and Tajura Coast with totals of 10 and 25 individuals respectively. The total of 35 Stone Curlews is the highest so far, with the range in the previous years of 1–12 individuals.

Family CHARADRIIDAE

Five species belonging to this family were observed along the coastline: Ringed Plover 61 individuals (previous maximum 101 in 2011), Kentish Plover 339 individuals (previous maximum 1797 in 2007), Grey Plover 44 individuals (previous maximum 195 in 2006), Golden Plover 430 individuals (previous maximum 645 in 2006) and Lapwing 263 individuals (previous maximum 96 in 2011) (Table 3; Smart et al., 2006; Etayeb et al., 2007; EGA-RAC/SPA Waterbird Census Team, 2012; Bourass et al., 2013).

Family SCOLOPACIDAE

In different sites along the Libyan coast, particularly those with shallow water, we counted a total of 18 species belong the family Scolopacidae. This family was the largest during this survey (see Table 3). The number of individuals varied from species to species, and the highest was 1781 for Dunlin *Calidris alpina*, while the lowest was a solitary Whimbrel *Numenius phaeopus* in Farwah Lagoon. Moreover, Redshank *Tringa totanus* numbered 696 (previous maximum 1544 in 2010). Only three Black-tailed Godwits *Limosa limosa* (previous maximum 10 in 2005, 2006) and two Bar-tailed Godwits *Limosa lapponica* (previous maximum 17 in 2011) were observed at the westernmost part of

Libya (Coast Abu Kammash to Ras Ajdir). However, other species fluctuated in numbers through the years from 2005 to 2011, and showed a relative decrease in 2012, in relation to the reduced number of sites covered.

Family LARIDAE

A total of seven species of gull was observed (Table 3). In comparison to the previous years, the number of individuals was very low, for instance Black-headed Gull *Chroicocephalus ridibundus* in 2012 numbered 11,980 individuals, whereas the previous maximum was 25,352 in 2008. A total of 87 of the Near Threatened Audouin's Gull *Larus audouinii* (IUCN Red List) was counted in seven sites around Tripoli and Benghazi. However, this number was the lowest so far (previous maximum 670 in 2006).

Family STERNIDAE

Four species were observed from this family (Table 3). The highest number was for the Sandwich Tern *Sterna sandvicensis* with a total of 362 individuals. This number was in the range of the previous counts (83 in 2007 and 395 in 2010). Although this species existed in good numbers compared to the other *Sterna* species, there is no evidence so far of breeding in Libya. It is reported as a winter visitor (Bundy, 1976). Caspian Tern *Hydroprogne caspia* and Whiskered Tern *Chlidonias hybridus* were more or less in the range of previous counts (Table 3). A solitary individual of Lesser Crested Tern *Sterna bengalensis* was observed in Tajura Coast. This species is a summer breeder in some sites in eastern Libya. The population of Lesser Crested Tern can be seen in good numbers in Libya from late April till August (Hamza & Azafaf, 2012).

Family ALCEDINIDAE

10 individuals of Kingfisher *Alcedo atthis* were observed at different sites along the coastline (previous maximum 19 in 2005).

Non-waterbird species

Although this census did not target non-waterbird species, some species were occasionally recor-

Family	Scientific name	Common name	Total
ACCIPITRIDAE	<i>Buteo rufinus</i> (Cretzschmar, 1827)	Long-legged Buzzard	2
FALCONIDAE	<i>Falco tinnunculus</i> Linnaeus, 1758	Kestrel	3
STRIGIDAE	<i>Bubo ascalaphus</i> (Savigny, 1809)	Pharaoh Eagle Owl	1
UPUPIDAE	<i>Upupa epops</i> Linnaeus, 1758	Hoopoe	7
ALAUDIDAE	<i>Galerida cristata</i> Linnaeus, 1758	Crested Lark	67
	<i>Melanocorypha calandra</i> (Linnaeus, 1766)	Calandra Lark	13
HIRUNDINIDAE	<i>Riparia riparia</i> (Linnaeus, 1758)	Sand Martin	3
	<i>Hirundo fuligula</i> (Lichtenstein, 1842)	Rock Martin	20
	<i>Hirundo rustica</i> Linnaeus, 1758	Barn Swallow	6
TURDIDAE	<i>Phoenicurus ochruros</i> (Gmelin, 1774)	Black Redstart	3
MOTACILLIDAE	<i>Motacilla alba</i> Linnaeus, 1758	White Wagtail	41
TURDIDAE	<i>Erithacus rubecula</i> (Linnaeus, 1758)	Robin	4
	<i>Saxicola torquata</i> (Linnaeus, 1766)	Stonechat	26
SYLVIIDAE	<i>Sylvia melanocephala</i> (Gmelin, 1789)	Sardinian Warbler	4
	<i>Acrocephalus scirpaceus</i> (Hermann, 1804)	Reed Warbler	5
	<i>Phylloscopus collybita</i> (Vieillot, 1817)	Chiffchaff	18
LANIIDAE	<i>Lanius excubitor</i> Linnaeus, 1758	Great Grey Shrike	11
TIMALIIDAE	<i>Turdoides fulvus</i> (Desfontaines, 1789)	Fulvous Babbler	5
CORVIDAE	<i>Corvus corax</i> Linnaeus, 1758	Raven	3
STURNIDAE	<i>Sturnus vulgaris</i> Linnaeus, 1758	Starling	1725
PASSERIDAE	<i>Passer domesticus</i> Linnaeus, 1758	House Sparrow	79
FRINGILLIDAE	<i>Carduelis carduelis</i> Linnaeus, 1758	Goldfinch	5
	<i>Serinus serinus</i> Linnaeus, 1766	Serin	3

Table 4. Number of non-waterbird species and individuals counted in January 2012, Libya.

ded in and around wetlands. A total of 2054 individuals belonging to 23 species from 16 families was observed during this survey (Table 4). However, these numbers were the lowest among the previous years (2005–2011, see Table 2).

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REFERENCES

- Azafzaf H., Baccetti N., Defos du Rau P., Dlensi H., Essghaier M.F., Etayeb K., Hamza A. & Smart M., 2005. Report on an Ornithological Survey in Libya from 3 to 17 January 2005. Cyclostyled report to Regional Activities Centre/Special Protected Areas

- (MAP/UNEP), Tunis, Environment General Authority, Libya, and African-Eurasian Waterbird Agreement (UNEP/AEWA).
- Azafzaf H., Baccetti N., Defos du Rau P., Dlensi H., Essghaier M.F., Etayeb K., Hamza A. & Smart M., 2006. Report on an Ornithological Survey in Libya from 19 to 31 January 2006. Cyclostyled report to the Regional Activity Centre/Special Protected Areas (MAP/UNEP), Environment General Agency, Libya and to the African-Eurasian Waterbird Agreement (UNEP/AEWA).
- Bourass E., Baccetti N., Bashimam W., Berbash A., Bouzainen M., De Faveri A., Galidan A., Saied A.M., Yahia J. & Zenatello M., 2013. Results of the seventh winter waterbird census in Libya, January-February 2011. *Bulletin of the African Bird Club*, 20: 20–26.
- Bundy G., 1976. *The Birds of Libya: An Annotated Check-list*. BOU Check-list No. 1. London, UK: British Ornithologists' Union.
- EGA-RAC/SPA Waterbird Census Team. 2012. Atlas of Wintering Waterbirds of Libya, 2005–2010. Tunis: Imprimerie COTIM. Temporarily available at: http://www.isprambiente.gov.it/files/pubblicazioni/pubblicazioniidipregio/Atlas_of_wintering_waterbird_in_Libya_20052010.pdf.
- Etayeb K.S. & Essghaier M.F.A., 2007. Breeding of marine birds on Farwa Island, western Libya. *Ostrich*, 78: 419–421.
- Etayeb K., Essghaier M.F., Hamza A., Smart M., Azafzaf H., Defos du Rau P. & Dlensi H., 2007. Report on an Ornithological Survey in Libya from 3 to 15 February 2007. Cyclostyled report to the Regional Activities Centre/ Special Protected Areas (MAP/UNEP) and Environment General Authority, Libya.
- Etayeb K.S., Yahia J., Berbash A. & Essghaier M.F.A., 2013. Ornithological importance of Mallaha wetland in Tripoli, Libya. *Bulletin de la Société zoologique de France*, 138: 201–211.
- Hamza A. & Azafzaf H., 2012. The Lesser Crested Tern, *Sterna bengalensis*, State of knowledge and conservation in the Mediterranean Small Islands. Initiative PIM, 20 pp.
- Hamza A., Saied A., Bourass E.M., Yahya J., Smart M., Baccetti N., Defos du Rau P., Dlensi H. & Azafzaf H., 2008. Report on a fourth winter ornithological survey in Libya, 20–31 January 2008. Cyclostyled report to the Regional Activities Centre/ Special Protected Areas (MAP/UNEP) and Environment General Authority, Libya.
- Isenmann P., Gaultier T., El-Hili A., Azafzaf H., Dlensi H. & Smart M., 2005. Oiseaux de Tunisie. Société d'Etudes Ornithologiques de France, Muséum National d'Histoire Naturelle, Paris, France.
- Loh J., Green R.E., Ricketts T., Lamoreux J., Jenkins M., Kapos V. & Randers J. 2005. The living planet index: using species population time series to track trends in biodiversity. *Philosophical Transactions of the Royal Society B*, 360: 289–295.
- Smart M., Essghaier M.F., Etayeb K., Hamza A., Azafzaf H., Baccetti N. & Defos Du Rau P., 2006. Wetlands and wintering waterbirds in Libya, January 2005 and 2006. © Wildfowl & Wetlands Trust, 56: 172–191.
- Svensson L., Mullarney K., Zetterström D. & Grant P.J., 2010. *Collins Bird Guide*. 2nd Revised edition. Harper Collins Publishers, United Kingdom, 448 pp.