

STATUS AND DISTRIBUTION OF MIGRATING AND BREEDING MARINE BIRDS IN NORTH LEBANON

Ghassan Ramadan-Jaradi

National Council for Scientific Research, P.O.Box 118281, Beirut, Lebanon

Faculty of Science, Lebanese University, Hadath, Lebanon

grjaradi@cnrs.edu.lb

ABSTRACT

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The study of marine birds in the northern part of Lebanon recorded 2681 individuals, distributed over 86 species. Among them 35 are foreshore species, 18 coastal, 6 maritime, 9 ducks, 6 herons, 9 various saltwater related species and 3 terrestrial. The highest density is shown by the yellow-legged Gull *Larus michahellis* and common black-headed gull *Chroicocephalus ridibundus*. The globally vulnerable yelkouan shearwater *Puffinus yelkouan*, an endemic species to the Mediterranean, appears on the 9th rank in the classification of seabird species from the more to the least abundant, highlighting as such, beside other 6 globally near threatened species, the role that Lebanon can play in improving the conservation status of these species. Regarding the phenological status of species, 48 are passage migrant/winter visitors, 31 passage migrants, 5 winter visitors and 2 vagrant species. The surveys revealed that three coastal seabird species (Armenian gull *Larus armenicus*, slender-billed gull *Chroicocephalus genei* and sandwich tern *Thalasseus sandvicensis*) and one ubiquist species (Eurasian Golden Plover *Pluvialis apricaria*) are not rare as it was believed in previous papers but fairly common winter visitors. The study identified the yellow-legged gull breeding population to be 160 couples, and confirmed the second and third breeding records of the little ringed plover *Charadrius dubius*.

Keywords: marine birds, migratory, wintering, breeding, status, distribution

INTRODUCTION

Marine birds include species that live in saltwater or interact closely with the marine environment on a regular basis such as the waders of the foreshore, gulls of the coast and offshore, and shearwaters in the sea at large. The latter are also called maritime or pelagic bird species. Butchart *et al.* (2004) stated that the seabirds are the most threatened of all bird groups. This statement had been confirmed by Croxall *et al.* (2012). However, our experience in Lebanon over the last 22 years also showed decline of coastal bird species over the years, mainly due to habitat loss and secondly due to ingestion of pollutants that are poured into the sea through sewers of human agglomeration areas (Ramadan-Jaradi, unpublished). The knowledge about the marine bird species in Lebanon is limited, apparently due to the technological and logistic difficulties that are frequently associated with obtaining distribution data of bird species at sea. Few studies of Lebanon's birds with information on seabirds have been published. Of them, Bara, T. (1998, 2002), Busuttil and Flumm (1998), MacFarlane (1978), Ramadan-Jaradi and Ramadan-Jaradi (1997, 1999 and 2001), Ramadan-Jaradi *et al.* (2004 and 2008), Ramadan-Jaradi (2006), Ramadan-Jaradi and Bara (2009), Stenhouse (1904), Tohmé and Neushwander (1974, 1978) and Tohmé and Tohmé, 1986). Whereas the few existing and accessible coastal areas are still used by seabirds and waders in Lebanon, the main source of existing information is largely limited to Naqoura wild rocky and sandy shore area, Bayyada sandy shore, Tyre Coast Nature Reserve, Damour estuary, Beirut waterfront and Palm Islands Nature Reserve. The latter is an Important Bird Area (IBA), in addition to Specially Protected Area of Mediterranean Importance (SPAMI) and Ramsar Site. Apart from Palm Islands that is the only important source of information on birds from the shore of north Lebanon, the present study covers the previously but poorly surveyed areas situated along the shore and offshore that are extended between Batroun and Cheikh Zennad in North Lebanon. For practical reasons and scientific importance, we added to the Cheikh Zennad shore (see below Point Count No. 23), the salt pans that are located around 250 meters to the east of this shore.

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STUDY AREA

The study area lies along the foreshore running between Batroun to the SSW ($34^{\circ}17'22.53''\text{N}$ & $34^{\circ}17'22.53''\text{N}$) and Cheikh Zennad in the NNE ($34^{\circ}36'27.63''\text{N}$ & $35^{\circ}59'24.13''\text{E}$), 3 km before the northern border of Lebanon with Syria. To the west, it extends around 6 km and includes the Palm Islands Nature Reserve. The study area (Figure 1) covers 360 km^2 whereas the shore that is of 60 km long occupies a surface area not exceeding 6 km^2 .



Figure 1. Study area (hatched) in north Lebanon, including the sandy and rocky foreshores in north Lebanon.

MATERIAL AND METHODS

The methodology used depends on the objectives of the present study that are to determine the distribution of marine bird species, the size of their populations and their ecological status. Accordingly, we surveyed the study area between early December 2016 and mid-May 2017 with the point counts method during the breeding season (March-May) and linear transects in the sea and on the accessible shores of the mainland, often between 08:30 and 16:00 hr. The point counts method used was that described by Blondel *et al.* (1981) in which the points are, for the present study, not randomly chosen but previously selected on maps (Figures 2 and 3) to provide samples representative of the various habitats available in the study area and to ensure access to the foreshores. During the breeding season, breeding pairs of the bird species are recorded and located using GPS tool (see below). Outside the nesting period, presence and absence of species are also recorded together with the number of individuals/species using both, the point count and transect methods, where birds are recorded when seen in front and both sides of the transect. The transect method was used to observe birds

from a moving boat by looking forward and by scanning ahead to a 90° angle from either the port or starboard side, limiting observations to a transect band 300 m wide from the beam of the boat. Birds seen flying overhead are separated as a different category and subjected to discussion or interpretation, especially as some of them could be returning to their breeding sites and others may be passing over to go breeding on mainland. Photography was used for indoor identification and for documentation beside field findings. Observations made during the study period involved identification of all species of seabirds. Numbers of individuals were recorded, together with an indication of distance from the observer and approximate direction of flight. Where birds were seen at great distance or darkened under brightening sky and could not be specifically identified, they were identified to the highest taxa possible, *e.g.* *Sterna* sp.).



Figure 2. Fifteen stations (plots) extended between Palm Islands and Mina City, frequently studied with Point counts method. Previously used to monitor seabirds of Palm Islands within a project supported by RAC-SPA in late 2016.

Each survey lasted 10 minutes. 30 plots were studied, of them 24 by boat. On average, 6.5 visits to each plot were done, covering in total 32.5 hours distributed over 18 days (see Table 1). All visits were performed during the daylight hours, regardless of whether birds were present. At the beginning of each 10-minute survey, we recorded the boat's position, time of day, boat speed and direction, and a number of environmental variables (i.e., visibility, sea state, swell height, wind speed and direction). All birds observed in the transect were counted and identified as present in air, on rocks or on water. Binoculars were used to confirm the species identification and other details, such as age, moult, and feeding behavior. Birds were continuously observed and recorded on the sea surface throughout the 10-min surveys and their perpendicular distance from the boat (0–50 m, 51–100 m, 101–200 m, 201–300 m) was estimated. A count of all flying birds passing through the transect would be a measure of bird flux and would overestimate bird density (Tasker et al. 1984). Therefore, flying birds were recorded using instantaneous counts at regular intervals throughout each 10-min survey. Overall densities were calculated for each 10-min survey as the number of birds observed in transect (all species combined) divided by the area surveyed.



Figure 3. Point counts (16-23) and linear transects (24-30) location in the study area.

Location (coordinates) of point counts and transects:

As for the timing and number of the field trips, they are shown in Table 1.

Table 1. Date and number of field trips to plots (study stations).

Point	Transect	Dates									No. of trips
	Breeding.....									
	wintering).....									
		21/1/17	28/1/17	4/2/17	11/2/17	28/2/17	1/3/17	3/3/17	3/4/17	5/5/17	
1		1	1	1	1	1	1	1	1	1	9
2		1	1	1	1	1	1	1	1	1	9
3		1	1	1	1	1	1	1	1	1	9
4		1	1	1	1	1	1	1	1	1	9
5		1	1	1	1	1	1	1	1	1	9
6		1	1	1	1	1	1	1	1	1	9
7		1	1	1	1	1	1	1	1	1	9
8		1	1	1	1	1	1	1	1	1	9
9		1	1	1	1	1	1	1	1	1	9
10		1	1	1	1	1	1	1	1	1	9
11		1	1	1	1	1	1	1	1	1	9
12		1	1	1	1	1	1	1	1	1	9
13		1	1	1	1	1	1	1	1	1	9
	14	1	1	1	1	1	1	1	1	1	9
	15	1	1	1	1	1	1	1	1	1	9
		22/1/17	29/1/17	5/2/17	12/2/17	29/2/17	2/3/17	4/3/17	4/4/17	5/5/17	
16			1		1		1		1		4
17			1		1		1		1		4
18			1		1		1		1		4
19			1		1		1		1		4
20				1		1		1		1	4
21				1		1		1		1	4
22				1		1		1		1	4
23				1		1		1		1	4
	24		1		1		1		1		4
	25		1		1		1		1		4
	26		1		1		1		1		4
	27		1		1		1		1		4
	28			1		1		1		1	4
	29			1		1		1		1	4
	30			1		1		1		1	4

Localities: 1) 34°27'26.53"N-35°48'33.71"E, 2) 34°27'46.01"N-35°48'3.32"E, 3) 34°27'49.51"N- 35°48'21.17"E, 4) 34°27'52.70"N-35°48'19.10"E, 5) 34°27'57.03"N-35°48'16.66"E, 6) 34°28'3.32"N-35°48'14.24"E, 7) 34°28'7.52"N-35°48'10.45"E, 8) 34°28'17.89"N-35°47'58.01"E, 9) 34°29'11.74"N-35°46'40.74"E, 10) 34°29'38.52"N-35°46'26.09"E, 11) 34°29'51.49"N-35°45'43.44"E, 12) 34°27'10.49"N-35°48'21.66"E, 13) 34°27'37.24"N-35°50'13.47"E, 14) 34°28'1.96"N-35°47'47.53"E, 15) 34°28'24.75"N-35°49'37.36"E, 16) 34°13'21.90"N-35°39'14.17"E, 17) 34°18'21.61"N-35°40'32.35"E, 18) 34°19'20.24"N-35°43'23.87"E, 19) 34°23'29.76"N-35°47'30.80"E, 20) 34°27'33.43"N-35°51'51.63"E, 21) 34°29'2.99"N-35°55'25.83"E, 22) 34°31'0.94"N-35°58'9.43"E, 23) 34°36'19.36"N-35°59'13.19"E, 24) 34°17'5.61"N-35°37'26.70"E (3-4km offshore), 25) 34°20'21.86"N, 35°41'31.31"E (4-5km offshore), 26) 34°23'24.78"N-35°43'16.80"E (3-4km offshore), 27) 34°25'15.61"N-35°48'43.28"E (800-1800m offshore), 28) 34°28'30.05"N-35°54'43.60"E (100-1100m offshore), 29) 34°31'14.65"N-35°57'33.20"E (700-1700m offshore), 30) 34°35'40.35"N-35°56'18.65"E (4.5-5.5km offshore).

RESULTS AND DISCUSSION

List of recorded species

The list of recorded species, together with their distribution and numbers, are shown in table 2 below.

Key

Abbreviations were used to indicate the species status, a question mark indicating uncertain status. Lower case abbreviations (eg r, sb, s, wv and pm) indicate that the species is uncommon or rare at the relevant season.

R	Resident with definite breeding records
SB	Breeding summer visitor
S	Non-breeding summer visitor
WV	Winter visitor
PM	Passage migrant
FB	Formerly bred (no breeding records since 1987)
v	Vagrant

After the scientific name, the following abbreviations denote conservation status of species as per the IUCN (2017) Red List categories for 2017. VU= Vulnerable. NT= Near Threatened.

Table 2. List of seabird species recorded with their individuals during the study period and their distribution over the study stations.

<u>Scientific name</u>	English name	Status	Locality Point-transect (number of individuals)	Total number of individuals/species
<i>Anser albifrons</i>	Greater white-fronted goose	wv, pm	9(4)	4
<i>Tadorna tadorna</i>	Common shelduck	pm, wv	10(2), 23(2)	4
<i>Tadorna ferruginea</i>	Ruddy shelduck	v	10(3)	3
<i>Anas strepera</i>	Gadwall	wv	9(7), 23(16),	23
<i>Anas penelope</i>	Eurasian wigeon	PM, wv	23(3)	3
<i>Anas platyrhynchos</i>	Mallard	PM, WV, sb	10(43), 23(18)	61
<i>Anas clypeata</i>	Northern shoveler	PM, WV	10(56)	56
<i>Anas acuta</i>	Northern pintail	PM, WV, s	10(27), 23(33)	60
<i>Anas crecca</i>	Eurasian teal	FB, PM, WV	10(6)	6
<i>Mergus serrator</i>	Red-breasted merganser	v	14(2)	2
<i>Podiceps cristatus</i>	Great crested grebe	wv, pm, s	1(1), 14(1)	2
<i>Calonectris diomedea</i>	Scopoli's shearwater	PM, wv	5(1), 8(1), 9(1), 14(1), 15 (1), 24(2), 29(1)	8
<i>Hydrobates leucorhoa</i>	Leach's storm petrel	?wv	16(1), 30(1)	2
<i>Puffinus yelkouan</i> (VU) (IUCN,2017)	Yelkouan shearwater	PM, wv	14(4), 15(17), 24(23), 28(11)	55
<i>Phoenicopterus roseus</i>	Greater flamingo	?wv	26(3), 20(2)	5
<i>Plegadis falcinellus</i>	Glossy ibis	pm, s	21(2)	2
<i>Platalea leucorodia</i>	Eurasian spoonbill	pm	23(2), 20(4)	6

<i>Botaurus stellaris</i>	Eurasian bittern	wv, pm	10(1)	10
<i>Ardeola ralloides</i>	Squacco heron	PM, wv	11(4), 16(2), 23(3)	9
<i>Bubulcus ibis</i>	Western cattle egret	pm, wv	1(5), 14(2), 15(4), 18(3), 20(5), 22(4)	23
<i>Ardea cinerea</i>	Grey heron	PM, wv	2(2), 7(3), 8(7), 9(3), 10(18), 11(5), 17(1), 21(1)	40
<i>Ardea alba</i>	Great egret	pm, wv, s	1(1), 9(1), 17(2)	4
<i>Egretta garzetta</i>	Little egret	PM, wv, S	1(4), 2(1), 3(5), 4(2), 5(1), 6(8), 9(2), 12(3), 17(2), 19(3), 22(4), 23(7)	42
<i>Pelecanus onocrotalus</i>	Great white pelican	PM	3(1), 4(1), 15(73), 20(43), 22(32)	118
<i>Morus bassanus</i>	Northern gannet	wv	18 (3), 22(1)	4
<i>Phalacrocorax carbo</i>	Great cormorant	WV, PM, s	1(4), 2(2), 3(5), 4(1), 5(6), 6(13), 7(15), 8(11), 9(6), 10(5), 11(2), 12(4), 13(1), 14(4), 15(7), 16(3), 18(2), 19(9), 21(2), 25(2), 28(2)	106
<i>Falco eleonora</i>	Eleonora's falcon	FB, pm	10(1)	1
<i>Falco tinnunculus</i>	Common kestrel	R, PM, WV	10 (2) breeding	2
<i>Crex crex</i>	Corncrake	pm	10 (6)	6
<i>Fulica atra</i>	Eurasian coot	R, PM, WV	1(2)	2
<i>Haematopus ostralegus</i> (NT) (IUCN,2017)	Eurasian oystercatcher	pm	9(2), 18(1), 19(1)	4
<i>Himantopus himantopus</i>	Black-winged stilt	PM	10 (38), 11(21), 23(8),	67
<i>Recurvirostra avosetta</i>	Pied avocet	pm, wv	17(2), 23(3)	5
<i>Vanellus spinosus</i>	Spur-winged lapwing	pm, sb	1(2), 18(2), 20(1), 21(2) breeding	7
<i>Vanellus vanellus</i>	Northern lapwing	PM, WV	16(3)	3
<i>Pluvialis apricaria</i>	Eurasian golden plover	pm, wv	1(120), 5(14), 6(11)	145
<i>Pluvialis squatarola</i>	Grey plover	pm, wv	3(4), 4(2), 5(1), 6(8), 7(6), 17(3), 19(2)	26
<i>Charadrius morinellus</i>	Eurasian dotterel	pm, wv	1(3), 23(7)	10
<i>Charadrius hiaticula</i>	Common ringed plover	PM, wv, s	1(5), 2(3), 16(10), 17(2)	20
<i>Charadrius dubius</i>	Little ringed plover	PM, s	18(4), 19(2) breeding	6
<i>Anarhynchus alexandrinus</i>	Kentish plover	pm, s	10(1)	1
<i>Anarhynchus leschenaultii</i>	Greater sand plover	pm	10(1)	1
<i>Gallinago gallinago</i>	Common snipe	pm, wv	10(2)	2
<i>Limosa limosa</i> (NT) (IUCN,2017)	Black-tailed godwit	pm	1(1), 9(1)	2
<i>Numenius phaeopus</i>	Whimbrel	pm	10(1)	1

<i>Numenius arquata</i> (NT) (IUCN,2017)	Eurasian curlew	v, ?pm	10(1)	1
<i>Tringa ochropus</i>	Green sandpiper	PM, wv	1(3), 2(2), 6(2), 20(6)	13
<i>Tringa totanus</i>	Common redshank	pm, wv	1(1), 11(5), 12(6), 17(2), 19(1), 23(3)	18
<i>Tringa stagnatilis</i>	Marsh sandpiper	pm, ?wv	16(3)	3
<i>Tringa nebularia</i>	Common greenshank	PM, wv	7(4), 18(1), 23(4)	9
<i>Tringa ochropus</i>	Green sandpiper	PM, wv	21(2)	2
<i>Tringa glareola</i>	Wood sandpiper	PM	21(1)	1
<i>Xenus cinerea</i>	Terek sandpiper	pm	23(1)	1
<i>Actitis hypoleucos</i>	Common sandpiper	PM, wv, s	3(2), 10(1), 19(1), 22(1), 23(3)	8
<i>Calidris minuta</i>	Little stint	PM	21(3), 23(7)	10
<i>Calidris temminckii</i>	Temminck's stint	pm	23(3)	3
<i>Calidris alba</i>	Sanderling	pm	17(15), 18(2), 22(3), 23(17)	37
<i>Calidris ferruginea</i> (NT) (IUCN,2017)	Curlew sandpiper	pm, s	16(1)	1
<i>Calidris alpina</i>	Dunlin	PM, WV	10(17), 17(5), 19(8), 23(3)	33
<i>Calidris falcinellus</i>	Broad-billed sandpiper	pm	11(2), 21(1)	3
<i>Calidris pugnax</i>	Ruff	PM, wv, s	9(6), 10(11), 25(7)	24
<i>Phalaropus lobatus</i>	Red-necked phalarope	pm	19(1)	1
<i>Arenaria interpres</i>	Ruddy turnstone	pm	4(2), 6(4), 7(6), 8(5), 18(3), 21(2), 22(1)	23
<i>Glareola pratincola</i>	Collared pratincole	pm	17(1)	1
<i>Glareola nordmanni</i> (NT) (IUCN,2017)	Black-winged pratincole	pm	18(1)	1
<i>Ichthyaetus melanocephalus</i>	Mediterranean gull	pm, wv	5(1), 17(3), 21(1), 23(1)	6
<i>Hydrocoloeus minutus</i>	Little gull	pm, WV	5(7), 12(2), 14(11), 16(3), 20(4), 23(22)	49
<i>Larus canus</i>	Common gull	WV, pm, s	10(3)	3
<i>Ichthyaetus audouinii</i>	Audouin's gull	FB, pm	10(4), 19(3)	7
<i>Chroicocephalus ridibundus</i>	Common black-headed gull	PM, WV	1(16), 2(22), 3(28), 4(13), 5(35), 6(3), 7(6), 8(12), 12(44), 13(32), 14(45), 15(63), 16(18), 17(3), 18(11), 19(2), 20(5), 21(2), 22(1), 23(7), 25(18), 28(15)	401
<i>Chroicocephalus genei</i>	Slender-billed gull	pm, WV	2(3), 3(3), 4(2), 5(4), 15(4), 19(3), 22(3)	22
<i>Larus marinus</i>	Great black-backed gull	pm, wv	16(2), 26(3)	5
<i>Ichthyaetus ichthyaetus</i>	Great black-headed gull	pm, wv	5(2), 18(2), 19(3), 20(1), 24(4)	12
<i>Larus michahellis</i>	Yellow-legged gull	R, PM, WV	1(6), 2(15), 3(11), 4(1), 5(13), 6(70), 7(54), 8(78), 9(31), 10(320), 11(9), 12(4), 13(8),	907

			14(3), 15(155), 17(3), 20(9), 22(4), 25(5), 27(3)	
<i>Larus armenicus</i> (NT) (IUCN,2017)	Armenian gull	v wv	4(2), 5(1), 7(2), 8(6), 17(2), 20(1)	14
<i>Larus cachinnans</i>	Caspian gull	wv, ?pm	10(3), 11(2), 18(1), 19(2)	9
<i>Larus fuscus fuscus</i>	Lesser black-backed gull	PM, WV, s	1(4), 2(2), 3(3), 9(1), 10(3), 16(2), 20(3)	18
<i>Gelochelidon nilotica</i>	Gull-billed tern	pm	15(10)	10
<i>Thalasseus sandvicensis</i>	Sandwich tern	pm, wv	1(5), 2(2), 3(3), 9(6), 10(4), 19(3)	23
<i>Sterna hirundo</i>	Common tern	FB, PM	24(1), 29(2), 30(1)	4
<i>Sterna albifrons</i>	Little tern	FB, pm	30(3)	3
<i>Chlidonias leucopterus</i>	White-winged tern	PM	20(2), 24(2)	4
<i>Chlidonias niger</i>	Black tern	pm	25(1)	1
<i>Stercorarius pomarinus</i>	Pomarine skua	pm, wv	1(2), 18(1), 25(1)	4
<i>Stercorarius parasiticus</i>	Arctic skua	pm, wv	1(1), 9(4), 10(2), 11(1), 30(1)	9
<i>Alcedo atthis</i>	Kingfisher	Pm, wv, s,	1(1), 10(1), 16(1), 17(1), 18(1), 20(1)	6
Total 86 species				2681

From Table 2 above, the most abundant species were:

Yellow-legged gull *Larus michahellis*: It is the most abundant species that was encountered and observed in 20 out of 30 plots, performing all activities ranging from resting, roosting and feeding. It also breeds on Palm Islands where the total number of nests reached 160 (160 couples). The total number encountered of the birds of this species reached 907 individuals (34% of the total number of individuals recorded) of various ages. However, the population of this species is seen increased during winter and passage.

Common black-headed gull *Chroicocephalus ridibundus*: This winterer and passage migrant species is the second abundant bird taxon with 403 individuals (15% of the total number of individuals recorded) in 22 plots, mainly in the proximity of shores. By mid-March the wintering Common Black-headed Gull is rarified considerably due to departure despite the passage of migrants.

Eurasian golden plover *Pluvialis apricaria*: It occupies the third rank in terms of abundance where 145 individuals (5.41% of the total number of individuals recorded) occurred in three plots (1, 5 and 6) between Mina and Palm Islands Nature Reserve. This finding indicates that the species is not rare as previously believed in Ramadan Jaradi *et al.* (2008) but an overlooked fairly common species.

Great white pelican *Pelecanus onocrotalus*: This common migratory species appeared with 118 individuals on rocks, in water and overhead. According to local people, this pelican species is much more abundant as it appears regularly all over the study area during its passage as a pure migrant.

Great cormorant *Phalacrocorax carbo*: A common winterer and to a less extent passage migrant recorded in 20 plots with 106 individuals, chiefly on plots 6 and 7.

Black-winged stilt *Himantopus himantopus*: It is the fifth in terms of abundance despite the fact that it was recorded on plots 10, 11 and 23 only and it wasn't observed during the whole wintering period.

Other species of the same abundance of the Black-winged Stilt include three duck species (Mallard *Anas platyrhynchos*, Northern Pintail *Anas aucuta* and Northern Shoveler *Anas clypeata*), one gull (Little Gull *Hydrocoloeus minutus*), two herons (Little Egret *Egretta garzetta* and Grey Heron *Ardea cinerea*) and most importantly the Yelkouan Shearwater *Puffinus yelkouan*, a globally threatened species classified by IUCN (2016) as Vulnerable and endemic to

the Mediterranean sea only. It's presence in the offshore areas (plots 14, 15, 24 and 28) in Lebanon as winterer indicates that the role of Lebanon for its conservation is of very high significance.

Of the 86 species recorded in the study area, 35 were foreshore species (waders like plovers and sandpipers), 18 were coastal (gulls and Terns), 6 maritime species (e.g. petrels, shearwaters, skua, gannet), 9 ducks, 6 herons, 9 saltwater related species (e.g. cormorants, pelicans, mergansers) and 3 terrestrials as shown in Figure 4.

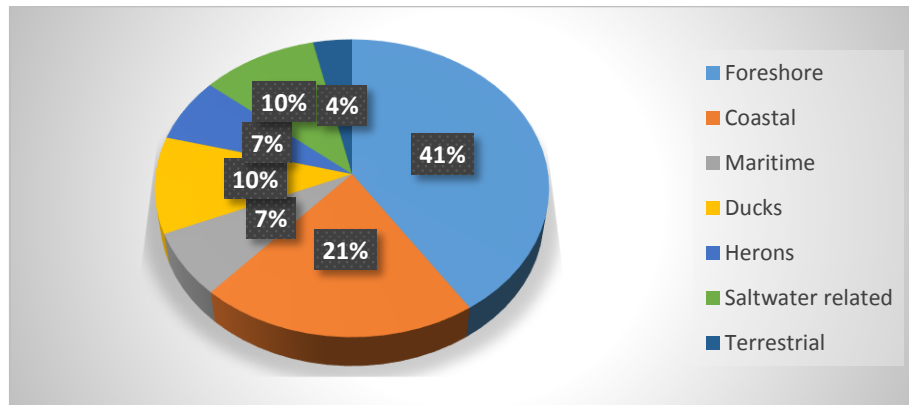


Figure 4. Percentage of seabird groups in the study area.

The phenological status of the encountered species is summarized in Figure 5 as follows: 48 passage migrants/winter visitors (PM/WV), 31 passage migrants (PM), 5 winter visitors (WV) and 2 vagrant species (Ruddy shelduck *Tadorna ferruginea* and Red-breasted merganser *Mergus serrator*). Before conducting this study, the Armenian gull *Larus armenicus* was also considered vagrant in Lebanon (Ramadan-Jaradi *et al.*, 2008), but today the species appeared to be an overlooked “not uncommon” winter visitor. Also the study demonstrated that like the Armenian gull, the slender billed gull, sandwich tern and Eurasian golden plover were fairly common during the winter 2017, whereas their status was irregular rare and extremely rare winter visitors, respectively, on the checklist of the birds of Lebanon (Jaradi *et al.*, 2008).

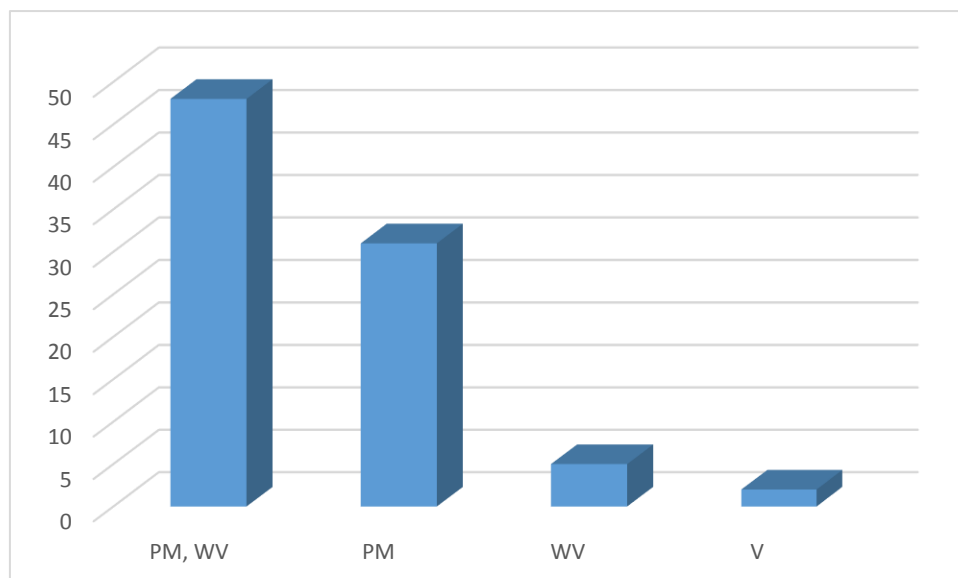


Figure 5. Phenological status of seabird species in the study area.

Of the 86 recorded seabirds' taxa, only two species do breed. Apart from the traditional breeding species (Yellow-legged gull), two breeding records of the little ringed plover *Charadrius dubius* constituted the second and third breeding records of the species at the national level.

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