



National Integrated Monitoring Programme for Coastal and Marine Birds in Lebanon

By

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National Integrated Monitoring Programme for Coastal and Marine Birds in Lebanon

Based mainly on the Draft Decision IG.22/7, Table of Contents for a National Integrated Monitoring Programme provided by SPA/RAC, Guidelines for Management and Monitoring Threatened Population of Marine and Coastal Bird Species and their Important Areas in the Mediterranean (UNEP/MAP - RAC/SPA, 2012) and the design given by the “Draft Integrated Monitoring and Assessment Guidance” (WG.420/4), as well as monitoring plans or programmes developed by EU Member States under the MSFD.

This monitoring programme is a detailed accounting of how we propose going about accomplishing the task of designing and executing the monitoring of coastal and sea birds at national level in Lebanon. This programme aims at:

- 1) understanding what is happening to the coastal and sea birds (distribution, density or abundance, ecological status and role in the ecosystem) in order to adapt our interventions accordingly,
- 2) detecting and acting on threats in appropriate time,
- 3) providing ammunition for advocacy and information for designing interventions, and 4) assessing the effectiveness of conservation efforts.

The data provided by the monitoring programme at national level give information on national marine ornithology trends. This feeds directly into reporting for the CBD, SPA/RAC and other international and, where appropriate, national organizations.

The following document on integrated monitoring is limited to the sea birds of Lebanon only.

I. Regulatory aspects/ Legislation:

Nationally: The Law of Hunting 580/2004 doesn't include any sea bird among the game birds that are allowed for hunting. Thus, all sea birds, including foreshore birds are protected by the Lebanese Law on Hunting.

Regionally: being a contracting party to the Barcelona convention, Lebanon is committed to the protection of the birds in Annex II of the Protocol concerning Specially Protected Areas (SPAs) and biological diversity in the Mediterranean.

Internationally: Lebanon is committed to the conservation of threatened waterbird species as being Contracting Party to AEWA Agreement.

II. Existing monitoring activities and available human and technical resources

Ornithology and Birdwatching aren't well practiced in Lebanon. Since 1972, Lebanon hosts one professional ornithologist only. In his capacity as manager of Palm Islands Nature Reserve, he studied the birds of this protected area and issued a monitoring manual for its key bird species. He contributed also to the study of Tyr Coast Nature Reserve avifauna in a project implemented by the Lebanese University on behalf of the Ministry of Environment and funded by UNDP during 2004-2005. At the same period, he studied the birds of Naqoura and Damour under the marine conservation areas project of SPA/RAC. Few foreign birdwatchers worked in Lebanon and

satisfied their hobbies of birding during weekends between 2000-2011. Only 4 or 5 of them paid modest attention to sea birds.

Lebanese birdwatchers emerged after 2012 as a reaction from responsible hunters against bird shooters. Presently there are seven individuals with always no interest to pelagic birds as the boat rental for their observation is costly.

In brief, the only existing seabirds monitoring scheme is on Palm Islands Nature Reserve. It was covered by SPA/RAC: Monitoring marine and coastal birds in Palm Islands Nature Reserve (SPAMI 2012) and its surroundings by the ornithologist professor Ghassan Ramadan Jaradi who also surveyed in 2017 the distribution of migrating and breeding Marine birds in North Lebanon. The other birdwatchers constitute a potential human and technical resource for sea bird monitoring activities.

III. National monitoring programme of sea birds in Lebanon

Given the relevance of the Lebanese Sea as a migration corridor between the Eurasia and Africa, coastal monitoring programmes could be of relevance to assess seabirds in the East Mediterranean region.

1. Presentation

1.1. Challenges of the sea birds monitoring programme

The aims of this programme are to monitor and assess the common indicators in relation to the Ecological objective 1 (EO1: biodiversity):

- Common Indicator 3 (CI3): the distributional range of marine bird species (EO1),
- Common Indicator 4 (CI4): the population abundance (EO1) and
- Common Indicator 5 (CI5): the population demographic characteristics (EO1).

In addition, marine birds as top predators are an essential avian group to understand the structure and functioning of ecosystems (EO8 CI16) and the trophic web (EO4 "Marine food web", which the related CIs are still under development). Moreover, the autopsy of the found dead birds allows to document the effects of the contaminants on the species (EO9 "Contaminants", CI17 to CI22) and the impacts of macro-waste on the birds (EO10 "Marine litter", CI 22 and CI 23). Finally, the programme will make it possible to periodically update the assessment of the group "seabirds" studied, as well as the impacts of various pressures including contaminants, waste, bycatches, renewable marine energies, extraction of granulates, etc.

1.2. Evaluation of the achievement of the Good Environmental Status (GES) and associated Ecological Objectives

This programme makes it possible to monitor and assess the following ecological objective and their common indicators

Common Indicators of EO1 (Biodiversity):

At the level of species

Common Indicator 3: Species distributional range

- Areas of distribution
- Distribution map/scheme in the said area, where applicable

Common Indicator 4: Populations abundance

- Abundance or number of individuals in a population and/or biomass of populations (summed weights), depending on the case

Common Indicators 5: Population demographic characteristics

- Demographic characteristics of populations if any [p. ex. Structure by size or age, sex distribution, fertility rate, survival / mortality rate]
- Population genetic structure, if any

At the level of ecosystems

Ecosystems structure

- Composition and relative proportions of ecosystem components [habitats and species]

EO4 (Marine food web):

EO 8 (Contaminants):

- Common indicator 16: Length of coastline subject to physical disturbance due to the influence of man-made structures
- Candidate Indicator 25: Land use change

EO 10 (Marine litter):

Impacts of Wastes on Marine Life

- Candidate indicator 24: Trends in the amount of litter ingested by or entangling marine organisms focusing on selected marine mammals, marine birds and marine turtles¹.

1.3. Evaluation of the characteristics of the ecosystem as well as the pressures and impacts needed to analyse the ecological status

This programme provides information primarily on the following Initial Evaluation (IE):

1- “Characteristics and Ecological Status” - Biological Status:

- Marine birds.

2- “Pressure/Impacts” Component - Physical Pressures:

- Ecological Impacts of Marine Waste
- Ecological impact of contaminants
- Disturbance to Wildlife

¹ Candidate Indicators are indicators which still have many outstanding issues regarding monitoring and assessment, hence are recommended to be monitored in the initial phase on a pilot and voluntary basis. These indicators will be further developed towards common indicators in light of the ongoing implementation experience of IMAP.

3- "Pressures/Impacts" - Chemical pressures:

- Impacts of chemical substance on the ecosystem

4- "Pressure/Impacts - Biological Pressures:

- Bycatch

1.4. Evaluation of the achievement of environmental objectives and especially related operational objectives

This programme allows the evaluation of the achievement of the following Environmental Objectives:

Eastern Mediterranean (EM):

To guarantee the potential of the marine environment hospitality for birds: food, resting, reproduction, movement. In particular:

- Protect functional areas for avifauna (feeding, resting, moving, breeding areas, especially offshore areas)
- Reduce the pressure (ex. Visits to Palm Islands Nature Reserve during the birds breeding season with pet animals (dogs/cats)) exerted by certain terrestrial species on islands and islets serving as breeding sites
- Limit disturbance, especially noise and light, in nesting sites. (ex. No permits to visit islands or organize events for public during breeding season of birds).
- Control the pressure exerted on the environment and other avian species by populations of Yellow-legged Gull (ex. Control of pressure on Audouins Gull and on babies of Loggerhead marine turtles).

2. Organisation

The national monitoring programme of seabirds consists of 5 sub-programmes. They are organized according to a geographical distribution (coast versus offshore). Sub-programmes relating to the status of the environment are also noted (sub-programmes 1 to 3) and sub-programmes related to the pressures and impacts of human activities on the marine environment (sub-programmes 4 and 5) are also distinguished.

Sub-programme 1 - Birds of the foreshore

Sub-programme 2 - Breeding sea birds

Sub-programme 3 - Birds at sea

Sub-programme 4 – Beaching of birds

Sub-programme 5 - Interactions between birds and human activities at sea.

3. General comments on the programme

The programme is based on relatively expensive but low periodic campaigns (mainly a general flight over the waters under Lebanon's jurisdiction), and on annually recurrent actions that could be carried out by associations, volunteers, managers of Marine Protected Areas and / or research teams. Unfortunately, the current observation or the monitoring of marine birds in Lebanon is very rare, whereas the coastal birds are occasionally targeted. This is probably due to the high cost of the marine trips, associated with lack of interest in marine birds by the new wave of young birders.

IV. Sub-programme 1: Birds of the foreshore

1. Objectives and presentation

Seabirds have received relatively little attention in the Lebanese Sea area, particularly regarding the study of their distribution patterns at shore and sea. The most extensive coverage of the region regarding marine top predators has been probably conducted by Ramadan Jaradi (2001), who has conducted several surveys since 1995, using point counts and transects methodology. However, seabirds have been only marginal to a research work focused on cetaceans and sea turtles, and little information is available for the target groups of this study.

On the other hand, a handful of seabird sporadic surveys have been conducted in the last recent years, providing some relevant information for the region.

Waders and some other species (geese, ducks) depend on the good state of the marine environment, particularly of the foreshore, hereinafter referred to as birds of the foreshore. The objective of this sub-programme is to better identify the distribution and evolution of the numbers of these species. On some key sites, a characterization (mapping, trophic quality) of the main feeding areas of these birds and their spatial evolution is necessary to assess their accessibility in relation to human activities. The study of populations should also make it possible to estimate the areas at stake (interactions with human activities, e.g. Sheikh Zennad Salinas and wetland) and to understand the functional ecology of the populations studied and their responses to changes due to anthropogenic activities. The monitoring also provides information on the demographic functioning of populations and their dependence on trophic resources (EO4 "Marine food webs").

2. Parameters followed and link to other programmes

The parameters to be followed are as follows:

- Presence and distribution of foreshore species.
These parameters inform about the spatial and temporal distribution of populations.
- Abundance of foreshore species
These parameters provide information on the number of coastal non-breeding waders and their temporal and spatial evolution.
- Functional areas: feeding and resting area
- Food of waders: composition, analysis of stomach contents, faeces, regurgitated matters.
- Characteristic parameters of the trophic resource in the environment (abundance and specific composition of benthic fauna)

Sampling of sediment could be carried out under this sub-programme, in particular for the study of trophic resources of waders.

3. Means / tools used / protocol elements

Monitoring of foreshore species is carried out on foot from the foreshore (Waders) or by small coastal vessels and results in monthly counts, sampling and telemetric monitoring if any.

Elements of protocol

The monitoring process will be done according to the methodology of Point Counts and linear transects. Some supplements may be made by also performing counts at low tide. The choice (stratified sampling stations) and number of sites (plots) will be determined in the first monitoring cycle prior to operational implementation.

- Feeding areas of the foreshore species: obtained visual observation of the behaviours. This makes it possible to assess accessibility in relation to human activities and/or the determination of the research effort. The determination of the main feeding areas then makes it possible to locate sampling stations to characterize the sediments and associated benthic macrofauna (protocol tested on 10 coastal communities in the Atlantic Channel since 2007 under the Intertidal Benthic Habitats section of the “Observatoire Patrimoine Natural Littoral RNF-AAMP”);

- Diets of foreshore (including waders) bird species: analysis of stomach contents, faeces, regurgitated material (or stable isotopes) allows to define the composition and the quality of the diet;

Trophic resources for the foreshore species, available biomass, distribution of prey tracers searched by species.

4. Spatial coverage and sampling strategy

Spatial coverage

The areas covered by these monitoring activities should correspond to the zones of agglomeration of birds at high tide (repositories) and feeding areas at low tide, mainly located in the intertidal zone.

These monitoring activities concern littoral complexes identified as functional complexes for the resting of waders. Currently, about no one functional site is monitored.

The monitoring sites adopted during the national validation workshop of this programme are:

- The area from Ras Chekaa to Palm Islands,
- The area from: Beirut Harbor to Ramlet El Baida and,

The area of: Tyre, Tyre Coast Natural Reserve and El Bayada

Sampling Frequency

Sampling of shorebirds should preferably be monthly for the majority of sites and should be carried out at high tide (on the repository), and at low tide, as this is necessary for the study of the functionality of the sites, the state of the benthic resource, interactions with human activities, etc. The protocol will therefore evolve in this direction.

5. Implementation of the monitoring

Existing mechanisms for monitoring

Currently there is no specific national mechanism in function.

The monitoring will preferably be carried out according to the methodology of Point Counts and linear transects. Other monitoring activities conducted by volunteers within the framework of Wetland International as well as other monitoring activities conducted through tracking with Satellite (PTT), GPS, and GLS will be able to supplement the data acquired at the national level.

6. Conclusions on the implementation of this sub-programme

In conclusion, the monitoring process of birds of the foreshore should be developed soon in order to make the monitoring operational and carried out along the coasts of Lebanon. This monitoring can therefore be evaluated as early as 2019 for the needs of the programme. However, sampling is currently limited to two Marine Protected Areas, notably the Palm Islands Nature Reserve and the Tyr Coast Nature Reserve and therefore does not concern the entire Lebanese coast. For these reasons, this monitoring will be extended to other sites such as certain Special Protection Areas of Mediterranean Importance (SPAMIs). They should also be completed in terms of parameters and species to be monitored.

V. Sub-programme 2: Breeding sea birds

1. Objectives and Presentation

The monitoring of breeding seabirds provides information on the demographic functioning of populations, their reproductive performance and their dependence on trophic resources (EO1 "biodiversity", EO4 "Marine food web"). All these species of seabirds are meant to be protected at national level.

In addition, monitoring of pollution of the marine environment by the macro-waste (EO10 "Marine litter") can be done by listing the amount of macro waste used by certain species of seabirds to build their nest (indicator developed and used elsewhere in France). This indicator has great potential for assessing the good environmental status. This monitoring also tracks the contamination of certain pollutants in eggs (EO9 "Contaminants").

2. Parameters tracked and link to other programmes

The parameters to be followed are:

- Presence and distribution of breeding species

These parameters inform on the presence of the species by sites and specify the geographical distribution of the colonies by species and the temporal evolution of the latter.

- Nesting abundance

This parameter indicates the number of breeding pairs by species and their demographic trend.

- Young production: average number of young fledglings per breeding pair
- Success of the reproduction: percentage of couples who successfully raised young birds

These two parameters point to the reproduction performance and possible inter-annual or geographical variations.

- Movement of breeding birds

This parameter makes it possible to evaluate feeding zones, their accessibility in relation to human activities, to determine the food research effort of individuals and thus to inform the functional areas.

- Characteristic parameters of the trophic diet (composition, analysis of stomach contents, faeces, regurgitated matter or stable isotopes)

- Pathogens (parasites, viruses, bacteria)
- Quantity of waste in nests
- Quantity of pollutants in eggs

Data from this sub-programme may also be used for other monitoring programmes such as marine litter and contaminant programmes.

3. Means / tools used / protocol elements

Monitoring is usually carried out on land (for landing in breeding colonies) or on foot on the coast, or on board of small coastal vessels or by air means (on some colonies, aerial photo tracking is tested). Monitoring techniques are based on colony counts (with biopsies, feather sampling), and on macro waste monitoring for certain species, and on telemetry (when available) monitoring to answer specific questions.

Elements of protocol

- **Presence, distribution and numbers of breeding species:** standardized census methodology.
- **Demographic parameters:** monitoring of breeding species to determine juvenile production and reproductive success and monitoring by capture-marking-recapture of individuals tagged in colonies.
- **Trophic diet:** species-specific studies: direct observations for Terns; Cormorants by analysis of regurgitation balls; Gannets and procellariiformes (Petrels and Shearwaters) by analysis of regurgitated matter; Isotopic signatures in feathers.
- **Pathogens:** by smear on eggs, by taking feathers, blood.
- **Functional area for breeding birds:** colonies/ feeding sites in the sea: telemetric monitoring of individuals (Argos beacons, GPS, GLS, etc.) and by monitoring in ships.

4. Spatial coverage and sampling strategy

Decennial censuses (numbers, distribution, etc.)

The census should be maintained every 10 years on all colonies if existing. For logistical reasons, it is not feasible to carry out a complete census more regularly than on a decennial basis for seabird species with a wide geographical distribution.

Yearly fine-tuned monitoring of target colonies (population case).

In addition to these national survey periods, intermediate data are collected by various structures at more regular time intervals, whether annual or not, and coordinated or not at regional scales. It is necessary to rely on all such regular monitoring activities if available. This is the case of studies and regular monitoring of birds on Palm Islands Nature Reserve and its surrounding waters.

In parallel with these counts, more specific and more detailed studies on target species and colonies need to be put in place in order to estimate different state parameters.

A census of target colonies is recommended every year in nature reserves, national parks, marine natural parks and for the main colonies of other protected sites.

Data on demographic parameters, diet and pathogens on target colonies will be collected annually. Data will be analysed on these colonies to assess population trends, reproductive success, survival, diet, pathogens.

Finally, depending on the means available, telemetric surveys on some individuals of the main colonies of certain species should be funded and carried out. For target species such as gannet or the puffin in the Mediterranean, all the colonies will be followed.

5. Implementation of monitoring programme

Existing mechanisms for monitoring:

Currently there is no specific national mechanism in function.

The monitoring will preferably be carried out according to the methodology of Point Counts and linear transects. Other monitoring activities conducted by volunteers within the framework of Wetland International will be able to supplement the data acquired at the national level.

6. Conclusions on the implementation of this sub-programme

In conclusion, monitoring of breeding seabirds (Yellow-legged Gull excepted) is not yet operational in Lebanon. Specific monitoring on target species and colonies will be set up in order to estimate other parameters (breeding success, diet, pathogens ...). With respect to the use of telemetry on the colonies, annual monitoring of the census of target colonies in marine protected areas should be established whenever colonies are detected.

VI. Sub-programme 3: birds in sea

1. Objectives and presentation

This sub-programme aims to map the distribution and density of seabirds (but also marine mammals and sea turtles). It contributes to the assessment of the ecological status of seabirds (EO1 "biodiversity"), analysis of the functioning and the status of the trophic web (EO4 "trophic web"). It also helps to estimate the pressure of human activities (maritime traffic and fishing, waste – EO10 "Marine Litter") on populations.

The monitoring of birds at sea can be carried out according to three types of devices:
Type A devices - Dedicated aerial observation campaigns (type SAMM: Suivi Aérien de la Megafaune Marine (Aerial Monitoring of Marine Megafauna))

The implementation of large surveys over all the waters under Lebanese jurisdiction will make it possible to collect observations on a large spatial scale and in a short space of time. It is a mean of monitoring that allows numerous optimizations between the EOs: EO1 "biodiversity", EO3 "commercial species", EO4 "Marine food web" and EO10 "Marine litter". It can be carried out at a fairly long time (6 to 12 years), giving an instantaneous picture of the distribution of species or groups of species for which specific identification is difficult with this type of method (ex. puffins), and human activities visible from an aircraft (fishing activities, boating, tourism, etc.).

Type B devices - Observation campaigns from non-dedicated vessels

This type of device provides an indication of the distribution and richness of species or groups of species. Repeated every year, it provides trends in spatio-temporal dynamics at shorter time scales and finer spatial resolutions than the previous one. Moreover, the system set up on the fishing campaigns makes it possible to obtain simultaneously information on the target species and their

environment (as well as on their prey in some cases), data necessary for the characterization of habitats and food webs (Ecosystem approach).

Type C devices - Observations from the coast at a fixed point

Air counting does not always result in accurate identification of species and vessel counts rarely cover the ultra-coastal zone. The coastal zone has densities of individuals sometimes very high. This device provides elements of spatio-temporal dynamics at a high periodicity. These observations are carried out under different programmes: IWC (Wetland International).

In the framework of this programme, the A and B devices, considered as priorities, will be the subject of evolutions and an operational optimization with the monitoring of mammals and sea turtles (common devices). Type C devices, which are considered to be of lower priority (because they still require harmonization of practices and scientific details), will not be modified.

2. Tracked parameters and link to other programmes

The parameters to be followed are:

- The presence and the distribution at sea of the individuals.

These parameters specify the spatio-temporal distribution of the rates of encounter of the species

- Abundance at sea: refers to the size of a population or a relative or absolute fraction extrapolated from observations

The data produced by the devices described in this sub-programme may also be used for the purposes of other thematic monitoring programmes: "Marine litter" (sub-programme macro floating waste), "Marine mammals and turtles" (at sea) and "Fish and cephalopods" (pelagic fish).

3. Means / tools used / protocol elements

This sub-programme is based on aerial surveys and observation campaigns from non-dedicated vessels (mainly fishing campaigns, state ships at sea, regular lines), observations from the coast at a fixed point.

Type A devices - Dedicated aerial observation campaigns (SAMM type)

Observers placed in high-wing twin-engine aircraft fitted with bubble portholes collect observations of the species encountered (mammals, turtles, birds). The protocol to follow is the one implemented in the framework of the SAMM campaigns (Air Monitoring of the Marine megafauna) of the program PACOMM ((Programme d'Acquisition de Connaissances sur les Oiseaux et les Mammifères Marins). Protocol elements are available at the following address: <http://cartographie.aires-marines.fr/?q=node/45> (section 1)

Type B devices - Observation campaigns from non-dedicated vessels

Observers on non-dedicated vessels the fishing campaigns collect information on the bird species. The standard protocol on which to rely is to adapt to the Mediterranean campaigns according to

the monitoring already carried out by local actors. Protocol elements are available at the following address: <http://cartographie.aires-marines.fr/?q=node/45> (section 2).

Type C devices - Observations from coast at fixed point

Observers, placed on strategic points of the Lebanese coastline, observe the seabirds with the binoculars or the long view.

The IWC (International Waterbird Census) monitoring is conducted by voluntary associations, one day a year. This monitoring concerns all water birds present in winter in Lebanon (anatidae, limicole, laridae, sternidae, podicipedidae... The data from the IWC monitoring are therefore complementary to the censuses of seabirds at the coast for wintering, and cooperation for a valuation of the available data are to be envisaged.

4. Spatial coverage and sampling strategy

Dedicated aerial observation campaigns (SAMM type)

The spatial coverage is adapted to the distribution of the species studied including marine mammals; The resolution is thus finer in coastal zone than offshore. The air campaigns will be carried out on all the Lebanese waters, when possible and appropriate, of the four marine sub-regions, with sampling in winter and one in summer. Indeed, distributions of seabirds are very different according to these two seasons. Only the completion of a flight plan with sufficiently fine mesh size, with extensive spatial coverage, repeated in both the winter and summer seasons, can yield statistically robust results for modelling habitats.

Observations from the coast at a fixed point

For coastal monitoring, the number and position of strategic points are those covering the most representative areas of the coastline.

5. Implementation of monitoring

Existing mechanisms for monitoring

Currently, there is no specific national mechanism in function

The monitoring will preferably be carried out according to the methodology of Point Counts and linear transects. Other monitoring activities conducted by volunteers within the framework of Wetland International as well as other monitoring activities conducted through tracking with Satellite (PTT), GPS, and GLS will be able to supplement the data acquired at the national level.

6. Conclusions on the implementation of this sub-programme

Monitoring under this sub-programme may begin in 2018 with the implementation of aerial and observation campaigns from the fishing vessels. Coastal monitoring for seabirds is very important because they allow for more accurate identification than follow-up from aerial or oceanographic vessels; However, it is necessary to go further in analysing the data of the monitoring in order to adapt the resolution of these monitoring and to be able to propose a more operational sampling strategy.

VII. Sub-programme 4: Beaching of birds

1. Objectives and presentation

Beaching on the coast represent the main source of access (with by-catch) to tissue and organ sampling to assess the ecological status of top predators (EO1 "biodiversity" of the Good Ecological State), the impact of anthropic pressures on them (EO10 "Marine litter", EO9 "contaminants") as well as the functioning of the trophic web (EO4 " Marine food webs").

Beaching also provides information on the presence, distribution and relative abundance of species.

VIII. Sub-programme 5: Interactions between birds and human activities at sea

Objectives and presentation

This sub-programme aims to observe and monitor the in-situ interactions between human activities at sea and seabirds in order to provide information on the state of populations in relation to pressures (EO1 "biodiversity", CI3, CI4 and CI5 related to marine sea birds) and will help to update the bycatch assessment.

It should be noted that human activities that probably have the most interactions with seabirds are terrestrial activities that can be a source of pressure on breeding colonies. These interactions, addressed through the induced pressures (disturbance, human trafficking, contaminants, marine litter, etc.) are dealt with in other programs and sub-programmes, in particular sub-programmes No. 2 "Breeding sea birds" and No. 4 "Beaching of birds ".)

For offshore activities and the uses that are subject to authorization and require an environmental impact assessment and monitoring, it would be appropriate to use these elements to assess the IMAP's EOs and their CIs. However, but to date, there do not appear to be any activities of this type likely to have an impact specifically on birds.

For the fishing activity, there is currently no specific monitoring for this sub-programme. Elsewhere, there are currently punctual studies that are carried out on this subject, including a project under development entitled "LIFE OMEGA", carried out by the LPO in France, aimed at evaluating the interactions between seabirds and human activities as well as wind and aggregate extraction.

IX. Threats to seabirds

(Parts applicable in Lebanon are inspired from a study entitled Status of seabirds in the Alboran Sea: UNEP/MAP/RAC-SPA)

A. OVERVIEW

Seabirds are among the most threatened bird groups in the world (Croxall et al. 2012), and their conservation requires urgent and well-coordinated action (Lewison et al. 2012). This vulnerability is partly due to the fact that seabirds commute between two totally different environments, the sea and the land (breeding colonies), each with its inherent threats (Boersma et al. 2002). Furthermore, they are highly mobile organisms that can travel across most of the planet during their life cycle,

and therefore face different threats in different regions. To complete the picture, seabirds' life history is characterized by high adult survival (usually around 90% annual survival in many species) and low reproductive success. Hence, their populations are very sensitive to any factors increasing adult mortality, as the population cannot compensate this “extra” loss of individuals by increasing its productivity (Croxall & Rothery 1991, Weimerskirch 2002).

Overall there is some consensus on major threats affecting seabirds (Boersma et al., 2002, Croxall et al. 2012). Inland, the most relevant are the pressure posed by invasive species (particularly predation by introduced mammals), habitat loss or degradation (due to coastal development), human disturbance, poaching and environmental change. At sea, the interaction with fisheries (especially bycatch), pollution, the proliferation of infrastructures and environmental change complete the list.

The relative importance of these threats may vary between regions and species, according to their geographical and ecological characteristics, and with the weight of the various human activities that take place in them. In the case of Lebanese sea and seashore, it is important to keep in mind that the local seabird community is diverse but partly composed by species that count with relatively small populations (due to the low productivity of the Mediterranean region).

B. THREATS INLAND

Coastal development

The increasing humanization of the coastline, including urban development, infrastructures, light pollution and disturbance, poses a threat to seabirds, particularly on their breeding grounds. This is particularly relevant for gulls, terns and waders breeding in foreshore areas, as these habitats have been severely affected by human activities.

Table 1. Overview of potential threats to the most relevant seabird species in the Mediterranean Sea (from a conservation perspective: those listed in the SPA/BD -Barcelona Convention- and/or included in Annex I of EU Birds Directive). Red: high impact; orange: moderate impact; green: low impact.

English name	Scientific name	Threat inland				Threat at sea				
		Predation by introduced Mammals	Coastal development	Human disturbance	Poaching	Fisheries bycatch	Prey depletion	Pollution	Infrastructures	Environmental change
Scopoli's shearwater	<i>Calonectris diomedea</i>									
Yelkouan shearwater	<i>Puffinus yelkouan</i>									
European storm-petrel	<i>Hydrobates pelagicus</i>									
Mediterranean gull	<i>Larus melanocephalus</i>									
Slender-billed gull	<i>Larus genei</i>									
Audouin's gull	<i>Larus audouinii</i>									
Sandwich tern	<i>Sterna sandvicensis</i>									
Lesser-crested tern	<i>Sterna bengalensis</i>									
Common tern	<i>Sterna hirundo</i>									
Little tern	<i>Sterna albifrons</i>									

Monitoring will assist fine tuning this table.

C. THREATS AT SEA

Fisheries bycatch

Seabird bycatch in fishing gear is one of the most serious threats to many seabird species. However, the available evidence is very limited. On the other hand, reports from beached bird surveys suggest that demersal longlines, nets and pole lines could have some impacts on seabirds elsewhere (García-Barcelona et al. 2010c). Further research is necessary to properly assess the incidence of bycatch in Lebanese sea, as high levels have been described in neighbouring areas of the Mediterranean Sea.

Fishing overexploitation

It is not known if the Lebanese sea holds a fishery for small-pelagic fish species, mainly sardine and anchovy, which has undergone severe fluctuations in the Mediterranean and is likely overexploited (Copemed II. 2011). Since these are the main natural prey for most seabird species,

keeping severe exploitation without proper assessment and management could cause impact on the seabird populations, both breeders and non-breeders (e.g. Louzao et al. 2006a, Cury et al. 2011).

Pollution

Both background and acute-events pollution pose a serious threat to seabirds worldwide, and the Lebanese sea is no exception. Of particular relevance is the risk of acute events of pollution such as oil spills, since the Lebanese sea already suffered from political tension that heavily polluted its waters and shores with oil spill in 2006. This political instability persists till today with a risk of another oil spill at any time.

Marine infrastructures

Development of infrastructures at sea could pose a risk to seabirds. Within the context of the Lebanon's sea, planned windfarms pose a particular threat given the relevance of the region for migrating seabirds (i.e. intense flow of seabirds prone to colliding with these infrastructures). So far, the area includes a few proposals of wind-farm development where the risk to seabirds would be high.

X. Baseline data for monitoring of sea bird species

Information regarding seabirds in the Lebanese Sea is patchy and requires of further research, particularly in the offshore. The following information is chiefly extracted from the studies of Ramadan Jaradi et al 2008.

1. Trigger and Priority (threatened bird species) for monitoring

***Puffinus yelkouan* Mediterranean Shearwater^{*2}: PM, wv:** Common on passage, usually in small numbers from early August–early September (200 reported off Tripoli in late September) and March–April. Few winter records of singles or flocks (up to 50) often mixing with Common Black-headed Gull *Larus ridibundus* while resting on surface water during November–February (GR-J). Observed offshore Beirut, Palm Islands, Tripoli and Naqoura. First recorded in 1877 by Van Dyck (Kumerloeve 1962). Ref. Ramadan Jaradi et al. 2008.

***Calonectris diomedea* Cory's Shearwater: PM, wv:** Common on passage March–mid May and early August–late September and recorded irregularly in large flocks offshore and near Palm Islands in January–February. Seen in Batroun, Beirut, Naqoura, Palm Islands, Tripoli and Tyre Coast. First recorded by Van Dyck in 1873-1878 (Carruthers 1910, Kumerloeve 1962). Ref. Ramadan Jaradi et al. 2008.

European Storm-petrel *Hydrobates pelagicus* ^{3}: V (vagrant):** Three records: singles off Ras Beirut on 18 September 1996 (Ramadan-Jaradi & Ramadan-Jaradi 1999), 10 April 1997 (Busuttil

& Flumm 1998a) and one at Naqoura, near southern border, on 21 December 2003 (GR-J). Ref. Ramadan Jaradi et al. 2008. Ref. Ramadan Jaradi et al. 2008.

European Shag *Phalacrocorax aristotelis* *4: Not yet recorded in Lebanon.**

Pygmy Cormorant *Phalacrocorax pygmeus*: wv, pm, s: Occasional passage in November and March, and scarce winterer, December-February, principally off Naqoura in the south and Palm Islands in the north. A single adult bird lingered at Aammiq from 24 June to 14 July 2005 (seen on 17 dates) (Colin Conroy pers comm). In the past, reported from inland at the Litani River (Tristram 1864) and at Aammiq Swamp in November 1954 (Nevins 1960). Ref. Ramadan Jaradi et al. 2008.

White Pelican *Pelecanus onocrotalus*: PM: Common regular passage migrant at both seasons with flocks of up to 1000 birds near coasts, at Aammiq and Qaraoun, and over mountains up to 1800m asl. Occurs mid-February–early June and early September–late November, principally on Palm Islands. First recorded by Tristram (1882). Ref. Ramadan Jaradi et al. 2008.

Dalmatian Pelican *Pelecanus crispus*: pm: Scarce: small flocks principally in March–April and November, in the Beqaa Valley, off Tyre, Tripoli and on Palm Islands (Ramadan-Jaradi & Ramadan-Jaradi 2001), and in Damour (Ramadan Jaradi et al. 2015). Largest flock encountered c45 on 3 April 1975 (Macfarlane 1978). Observed in Aammiq, Chtaura, Palm Islands, Qaraoun, Tripoli and Tyre. First recorded by Tristram (1882). Ref. Ramadan Jaradi et al. 2008, 2015.

Greater Flamingo *Phoenicopterus ruber*: pm, ?w: Status prior to 1999 unclear (Ramadan-Jaradi & Ramadan-Jaradi 1999). Recent records suggest that the species is a rare passage migrant and probably an equally scarce winter visitor, rather than a vagrant (Ramadan-Jaradi *et al* 2004): recorded 14 times during December, January, March, April, May, June, August, September and October; at Aammiq, Batroun, Beirut, Byblos, Cheikh Zennad, Khaldeh, Nahr Ibrahim and Palm Islands. First recorded in 1881 by Van Dyck (Kumerloeve 1962). Ref. Ramadan Jaradi et al. 2008.

Osprey *Pandion haliaetus*: pm: Uncommon passage migrant throughout the country from late March–late April and early September–early November. Sighted at Aammiq, Beirut, Cheikh Zennad, Dalhoun, Faqra, Hermel, Palm Islands, Qaa, Qbeiyat, Qleiaat and Tanayel. First recorded by Tristram (1865-68). Ref. Ramadan Jaradi et al. 2008.

Eleonora's Falcon *Falco eleonora*: FB, pm: Formerly bred (Tristram 1865-68). Extremely rare passage migrant (Ramadan-Jaradi & Ramadan-Jaradi 1999) late March-late May and early September-late October. Sighted at Aammiq, Ainab, Azour, Barouk, Beirut, Bjiro, Dalhoun, Damour, Deir el Qamar, Deir Mimas, Doueir, Fraidies, Hasrout, Kfarhim, Laqlouq, Nabatyeh,

Niha, Qbeiyat, Ras el Chekaa, Tanayel, Tel el Akhdar and Wadi el Zeina. First recorded by Tristram (1865-68). Ref. Ramadan Jaradi et al. 2008.

Slender-billed Curlew *Numenius tenuirostris*: Not yet recorded in Lebanon.

Audouin's Gull *Larus audouinii*: FB, pm: Bred on Palm island in 1895 (Stenhouse 1904); 18 there but apparently not breeding on 3 April 1973 (Tohmé & Neuschwander 1974); seven more records at the same place: ten on 23 August 1997 (Ramadan-Jaradi & Ramadan-Jaradi 1999), one on 1, 4 and 25 April 1998 and one on 6 July 2000 (Ramadan-Jaradi & Ramadan-Jaradi 2001); three on 4 April 2002 and four on 11 August 2004 (GR-J). Elsewhere: three off Beirut on 3 October 1958 (Flach 1959), five at Cheikh Zennad on 25 August 1996 (Bara 1998), six there on 5 April 2002 and 14 on 1 September 2003 (Ramadan-Jaradi 2003). These records above suggest that the Audouin's Gull is a rare passage migrant rather than vagrant. Ref. Ramadan Jaradi et al. 2008.

Lesser Crested Tern *Sterna bengalensis*: FB, e: Bred on Palm island in 1895 (Stenhouse 1904). No subsequent records (Ramadan-Jaradi & Ramadan-Jaradi 1999).

Sandwich Tern *Sterna sandvicensis*: pm, wv: Extremely rare passage migrant and winter visitor in early August-mid-April to coasts (Ramadan-Jaradi & Ramadan-Jaradi 1999) and Palm Islands (Ramadan - Jaradi & Ramadan-Jaradi 2001). Sighted at Beirut, Byblos, Cheikh Zennad, Damour and Palm Islands. First recorded in 1878 by Van Dyck (Kumerloeve 1962). Ref. Ramadan Jaradi et al. 2008.

Little Tern *Sterna albifrons*: FB, pm: Bred on Palm Islands at the end of the 19th century (Stenhouse 1904) but no subsequent records until 11 at Cheikh Zennad on 14 June 1996, three there on 8 September 1996 and eight on 16 May 1997 (TB), one at Sanani island on 4 April 1998 (Ramadan-Jaradi & Ramadan-Jaradi 1999) and two at Qaraoun Lake on 27 September 2003 (GR-J). All these records suggest that the Little Tern is a very rare passage migrant rather than vagrant. First recorded in 1877 by Van Dyck (Kumerloeve 1962). Ref. Ramadan Jaradi et al. 2008.

To fill the gaps in our knowledge of the species listed in the Action Plan, detailed surveys coordinated by national ornithological centres working together in a Mediterranean network, will have to be carried out.

2. Species of coastal wetlands for monitoring

White Pelican *Pelecanus onocrotalus*: PM: Common regular passage migrant at both seasons with flocks of up to 1000 birds near coasts, at Aammiq and Qaraoun, and over mountains up to 1800m asl. Occurs mid-February–early June and early September–late November, principally on Palm Islands. First recorded by Tristram (1882). Ref. Ramadan Jaradi et al. 2008.

Dalmatian Pelican *Pelecanus crispus*: pm: Scarce: small flocks principally in March–April and November, in the Beqaa Valley, off Tyre, Tripoli and on Palm Islands (Ramadan-Jaradi & Ramadan-Jaradi 2001), and in Damour (Ramadan Jaradi et al. 2015). Largest flock encountered c45 on 3 April 1975 (Macfarlane 1978). Observed in Aammiq, Chtaura, Palm Islands, Qaraoun, Tripoli and Tyre. First recorded by Tristram (1882). Ref. Ramadan Jaradi et al. 2008, 2015.

Greater Flamingo *Phoenicopterus ruber*: pm, ?w: Status prior to 1999 unclear (Ramadan-Jaradi & Ramadan-Jaradi 1999). Recent records suggest that the species is a rare passage migrant and probably an equally scarce winter visitor, rather than a vagrant (Ramadan-Jaradi *et al* 2004):

recorded 14 times during December, January, March, April, May, June, August, September and October; at Aammiq, Batroun, Beirut, Byblos, Cheikh Zennad, Khaldeh, Nahr Ibrahim and Palm Islands. First recorded in 1881 by Van Dyck (Kumerloeve 1962). Ref. Ramadan Jaradi et al. 2008. **Lesser Crested Tern *Sterna bengalensis*: FB, e:** Bred on Palm island in 1895 (Stenhouse 1904). No subsequent records (Ramadan-Jaradi & Ramadan-Jaradi 1999).

Sandwich Tern *Sterna sandvicensis*: pm, wv: Extremely rare passage migrant and winter visitor in early August-mid-April to coasts (Ramadan-Jaradi & Ramadan-Jaradi 1999) and Palm Islands (Ramadan - Jaradi & Ramadan-Jaradi 2001). Sighted at Beirut, Byblos, Cheikh Zennad, Damour and Palm Islands. First recorded in 1878 by Van Dyck (Kumerloeve 1962). Ref. Ramadan Jaradi et al. 2008.

Little Tern *Sterna albifrons*: FB, pm: Bred on Palm Islands at the end of the 19th century (Stenhouse 1904) but no subsequent records until 11 at Cheikh Zennad on 14 June 1996, three there on 8 September 1996 and eight on 16 May 1997 (TB), one at Sanani island on 4 April 1998 (Ramadan-Jaradi & Ramadan-Jaradi 1999) and two at Qaraoun Lake on 27 September 2003 (GR-J). All these records suggest that the Little Tern is a very rare passage migrant rather than vagrant. First recorded in 1877 by Van Dyck (Kumerloeve 1962). Ref. Ramadan Jaradi et al. 2008.

3. Species of special concern for monitoring

Yellow-legged Gull *Larus michahellis* R, PM, WV, S: Resident breeder (eggs mid-April, except for 2007 when first chicks hatched on 12 April) in fair numbers on Palm Islands (see Ramadan-Jaradi & Ramadan-Jaradi 1997, 1999, 2001). Fairly common passage migrant in March–mid-May and mid-August–early November; a relatively common winter visitor in mid-November–late February, and not uncommon non-breeding summer visitor in May–July. Occasional at inland wetlands. First recorded by Tristram (1864) and first breeding record was on Palm Islands in 1956 (Hollom 1959). Recently breeding was reconfirmed (for over 36 years) at Palm Islands in 1996 (Ramadan-Jaradi & Ramadan-Jaradi 1997, 1999, 2001). Ref. Ramadan Jaradi et al. 2008.

4. Species of foreshore that may be subject for monitoring

***Haematopus ostralegus* Eurasian Oystercatcher pm:** With only four records between 1955 and 1998, the Oystercatcher was considered vagrant in Lebanon (Ramadan-Jaradi & Ramadan-Jaradi 1999). Recent observations on Palm Islands Nature Reserve (Ramadan-Jaradi 2003) cover in 2002 one on 23 April and, two on 28 September and in 2003, one on 7 April and five on 11 May. Elsewhere, a putrefied corpse was found at Qaraoun Lake on 24 May 2004 (GR-J). Outside the range of the passage dates, one at Beirut on 9 July 2006 (Colin Conroy pers comm). These records suggest that the Oystercatcher is a regular but scarce passage migrant, the September record being the first for autumn (Ramadan-Jaradi *et al* 2005). Reported from Beirut, Cheikh Zennad, Khaldeh and Palm Islands. First recorded in 1955 (Nevins 1960).

***Himantopus himantopus* Black-winged Stilt PM:** Common passage migrant in early March–mid-May and mid-June–late October on islands (most on Palm Islands), coasts (principally at Cheikh Zennad) and inland waters (most at Aammiq). First recorded in 1877 by Van Dyck (Kumerloeve 1962).

***Recurvirostra avosetta* Pied Avocet pm, vv:** Scarce passage migrant in early-March–mid-May and early August–late October on coasts and islands. The occurrence of 2 at Cheikh Zennad on 18 January 2002 and one there on 20 December 2006 (GR-J) indicate that the species is also a rare winter visitor. Sighted at Beirut, Beirut River, Cheikh Zennad, Palm Islands, Qaraoun, Rachaya and Tanayel. First recorded by Schrader (1892).

***Vanellus spinosus* Spur-winged Lapwing pm, sb:** Breeding confirmed, and nest photographed at Tyre Coast Nature Reserve in June 2006 (GR-J). Scarce passage migrant in mid-February–mid-June (most mid-April–mid-May) and early August–late October. Most on Palm Islands, on coast, or at Aammiq and Qaraoun. Sighted at Aammiq, Beirut, Cheikh Zennad, Dbayyeh, Khaldeh, Nahr el Kalb, Palm Islands, Qaraoun, Saida and Tyre. First recorded by Van Dyck in 1873-1878 (Kumerloeve 1960a, 1962) and first confirmed breeding record was at Tyre in 2006 (GR-J).

***Pluvialis apricaria* Eurasian Golden Plover pm, vv:** Scarce passage migrant in March–April and uncommon in October–mid-November, mostly on coasts and in the Beqaa; extremely rare elsewhere. Few overwinter (late November–late March) in south Beqaa, Aammiq and Cheikh Zennad. First recorded by Tohmé & Neuschwander (1974).

***Pluvialis fulva* Pacific Golden Plover v:** One record: one at Cheikh Zennad on 12 October 1996 is briefly described (Bara 1998).

***Pluvialis squatarola* Grey Plover pm, vv:** Scarce passage migrant and winter visitor to coasts and islands in mid-August–late May. Recorded in Beirut, Cheikh Zennad, Khaldeh, Palm Islands and Tyre Coat. First recorded by Tristram (1864).

***Charadrius hiaticula* Common Ringed Plover PM, vv, s:** Relatively common passage migrant in late March–early June and mid-August–late October on coasts, islands, fishponds and inland waters. Few overwinter in November–March on coasts and islands. Very small numbers of non-breeders oversummer from June–July at Tyre Coast, Cheikh Zennad and Palm Islands. Recorded at Aammiq, Beirut, Cheikh Zennad, Chwaifat, Joub Jannine, Khaldeh, Litani River, Palm Islands, Naqoura, Qaraoun and Tyre. First recorded in 1875 by Van Dyck (Kumerloeve 1962).

***Charadrius dubius* Little Ringed Plover PM, s:** Relatively common in spring, from late March–mid May, and scarce autumn migrant, from early August–early October, on coasts and at inland waters (Beqaa). Also, a rare non-breeding summer visitor in June–late July, mainly on Palm Islands. Reported from Aammiq, Beqaa Valley, Cheikh Zennad, Ghadir River, Joub Jannine, Litani River, Palm Islands and Saida. First recorded in 1975 by Van Dyck (Kumerloeve 1962).

***Charadrius alexandrinus* Kentish Plover pm, s:** Rare to scarce passage migrant from early February–late May and early August–late December on coasts, estuaries and inland waters. Few non-breeders occasionally in June–July, mainly on coasts, Aammiq and Qaraoun Lake. Sighted at Aammiq, Cheikh Zennad, Damour, Jiyeh, Khaldeh, Qaraoun, Palm Islands and Tyre. First recorded in 1904 (Carruthers 1910).

***Charadrius leschenaultii* Greater Sand Plover pm:** Rare passage migrant from March–late April and occasional late July–September on coasts, fishponds and on Palm Islands. Reported from Aammiq, Beirut, Byblos, Cheikh Zennad, Damour, Jiyeh, Khaldeh, Palm Islands, Tyre Coast and Naqoura. First recorded in 1877 by Van Dyck (Kumerloeve 1962).

***Charadrius asiaticus* Caspian Plover v:** Four records: one at Beirut on 21 March 1904 (Carruthers 1910), one at the mouth of the Damour River on 26 April 1975 (Macfarlane 1978), one at Cheikh Zennad, on 11 April 2002 (Ramadan-Jaradi *et al* 2004), and one there on 22 September 2002 (Ramadan-Jaradi & Waterbury unpub).

***Charadrius morinellus* Eurasian Dotterel pm, wv:** Scarce in late September–November and only one spring record, of three at Tyre on 17 March 1995 (Ramadan-Jaradi & Ramadan-Jaradi 1999). Most records from coasts and the Beqaa Valley. Very small numbers occasionally winter in January–February at Qaraoun lake and the Litani River. Sighted at Baalbek, Beirut, Beqaa Valley, Cheikh Zennad (**Plate 2**), Damour, Litani River, Qaa, Qaraoun and Tyre. First recorded by Van Dyck in 1873–1878 (Kumerloeve 1960a, 1962).

***Scolopax rusticola* Eurasian Woodcock PM, WV:** Not uncommon and regular passage migrant and winter visitor in moderate numbers across most of the country, mainly in mid-October–mid-April, chiefly in the Beqaa area. Reported from Aammiq, Ain Zhalta, Beirut, Beirut River Valley, Beqaa Valley, Bzebdine, Byblos, Cheikh Zennad, Damour Valley, Ehden, Jabal Barouk, Jabal Rihane, Jezzine and Tyre Coast. First recorded by Carruthers in 1904 (Kumerloeve 1962).

***Lymnocyptes minimus* Jack Snipe pm, wv:** Rare passage migrant and scarce winter visitor from mid-October–late April, with most at Palm Islands, Qaraoun, Aammiq, Cheikh Zennad and the Litani River. Perhaps more common than records suggest. First recorded by Van Dyck in 1873–1878 (Kumerloeve 1960a, 1962).

***Gallinago media* (NT) Great Snipe pm:** Rare passage migrant mainly recorded in the Beqaa Valley (with most at Aammiq) and on Palm Islands, in mid-March–mid-May. Only four in autumn: one at Aammiq on 6 October 1956 (Kumerloeve 1962), one trapped at Aammiq on 14 September 1996 (Ramadan-Jaradi & Ramadan-Jaradi 1999), one there on 11 October 2005 (A Rocha Lebanon 2006), and [one reported at Lake Qaraoun on 6 October 2006 – (see Balmer & Betton (2007a)]. Sighted at Aammiq, Beirut, Beqaa Valley, Faraya, Palm Islands, Qaraoun, and Tyre Coast. First recorded in 1881 by Van Dyck (Tristram *in* Kumerloeve 1962).

***Gallinago gallinago* Common Snipe pm, wv:** Uncommon but regular passage migrant and winter visitor from mid-August–mid May. Occurs over most of the country but favours the Aammiq area, Bishmezzine and Tyre Coast, principally in winter. Sighted at Aammiq, Beirut, Beqaa Valley, Bishmezzine, Cheikh Zennad, Damour, Jounieh, Khaldeh, Palm Islands, Ryaq and Tyre Coast. First recorded in 1904 (Carruthers 1910).

***Limosa limosa* (NT) Black-tailed Godwit pm:** Scarce passage migrant during March–April and August–November. Four records at Aammiq: two on 17 March 1975 (Macfarlane 1978), one on 20 March 1997 (Busuttil *et al* 1997), [one on 15 September 2000 (Kirwan 2001)], and two on 11 October 2001 (Ramadan-Jaradi 2003). Six records at Cheikh Zennad in April, August–September and November with a maximum of five on 5 April 1997 (Bara 1998). One at Cheikh Zennad on 14 April 2000 (Ramadan-Jaradi 2003), one at Tel el Akhdar on 27 April 2005 (François Tron pers comm), and one there on 16 April 2006 (Colin Conroy pers comm). First recorded at Aammiq in 1975 (Macfarlane 1978).

***Limosa lapponica* Bar-tailed Godwit v:** Only four records: one at Cheikh Zennad on 12 May 1996 (Bara 1998), one at Aammiq on 5 May 2000 (Ramadan-Jaradi 2003), one there on 15

September 2000 (Beale & Sprenger 2001), and one at Tyre Coast on 14 October 2004 (Ramadan-Jaradi *et al* 2005).

***Numenius phaeopus* Whimbrel pm:** Rare passage migrant in April and early August–mid-October on coasts and islands. Recorded at Beirut, Batroun, Cheikh Zennad, Nahr el Kalb, Naqoura, Ouzaii, Palm Islands, Sarafand and Tyre. First recorded in 1956 (Hollom 1959).

***Numenius arquata* Eurasian Curlew v, ?pm:** Five records: one at Cheikh Zennad on 21 April 1996 and two there on 30 April 1996 (Bara 1998); three at Damour on 4 September 1996 (Ramadan-Jaradi & Ramadan-Jaradi (1999), one at Cheikh Zennad on 21 August 2005 (Colin Conroy pers comm) and [one at Naqoura on 10 October 2006 (see Balmer & Betton 2007a)].

***Tringa erythropus* Spotted Redshank pm:** With 14 records, the Spotted Redshank is a scarce passage migrant rather than true vagrant. It occurred at Aammiq, Cheikh Zennad, Khaldeh and Nahr Beirut in March–April and August–September, with only one winter record at Cheikh Zennad on 19 January 2000 (Ramadan-Jaradi *et al* 2005). First recorded in 1975 (Macfarlane 1978).

***Tringa totanus* Common Redshank pm, wv:** Uncommon but regular passage migrant in March–April and commoner from early August–late December. Few overwinter at Cheikh Zennad and Palm Islands during January–February. Regular on Palm Islands and coasts, much less so at inland waters (Ramadan-Jaradi & Ramadan-Jaradi 1999). Sighted at Aammiq, Batroun, Beirut, Beqaa Valley, Bishmezzine, Byblos, Cheikh Zennad, Palm Islands, Qaraoun and Tyre. First recorded in 1904 (Carruthers 1910).

***Tringa stagnatilis* Marsh Sandpiper pm, ?wv:** Uncommon passage migrant in early March–late April and early August–late October at coasts, estuaries and Palm Islands; and scarce at inland waters, including Aammiq. One winter record: at Al Ain near Tyre on 12 December 1996 (Ramadan-Jaradi & Ramadan-Jaradi 1999). Eleven records at Cheikh Zennad in April and August–November, with a maximum of 31 on 17 April 2006 (Colin Conroy pers comm). First recorded by Tohmé & Neuschwander (1974).

***Tringa nebularia* Common Greenshank PM, wv:** Relatively common passage migrant in March–April and late July–late October over much of the country. Very few in winter, from January–mid-February, in the Beqaa, principally at Qaraoun and the Litani River; and on the coast, principally at Cheikh Zennad and on Palm Islands. Sighted at Aammiq, Anjar, Beirut, Beqaa Valley, Cheikh Zennad, Damour, Litani River, Nahr Beirut, Naqoura, Palm Islands, Qaraoun, Tanayel and Tyre Coast. First recorded in 1877 by Van Dyck (Kumerloeve 1962).

***Tringa ochropus* Green Sandpiper PM, wv:** Fairly common passage migrant in late February–late June (most mid-March–mid-April) and late July–late October. Scarce winter visitor in November–February. Most at Cheikh Zennad, Palm Islands and at inland waters, including Aammiq; very few coastal records. Reported from Aammiq, Ain Zhalta, Beirut, Cheikh Zennad, Jabal Mazar, Joub Jannine, Laqlouq, Litani River, Palm Islands, Qaraoun and Tyre Coast. First recorded in 1877 by Van Dyck (Kumerloeve 1962).

***Tringa glareola* Wood Sandpiper PM:** Fairly common passage migrant from mid-February–late May and late July–early November, on islands, coasts and inland wetlands. Sighted at Aammiq, Cheikh Zennad, Damour, Joub Jannine, Khaldeh, Litani, Palm Islands and Qaraoun. First recorded by Van Dyck in 1873-1878 (Kumerloeve 1960a, 1962).

***Xenus cinerea* Terek Sandpiper pm:** Five records from Cheikh Zennad area only: one on 18 August 1996 (Bara 1998), one on 22 September 2002 (Ramadan-Jaradi *et al* 2005), one on 6 September 2003 (Marc Almecija pers comm), and three on 7 and a single on 21 August 2005 (Colin Conroy pers comm). These records suggest that the Terek Sandpiper is a rare passage migrant rather than vagrant.

***Actitis hypoleucos* Common Sandpiper PM, vv, s:** Common passage migrant and scarce winter visitor. Recorded year-round at inland waters, coasts and on islands. Reported from Aammiq, Amyoun, Anjar, Batroun, Beirut, Cheikh Zennad, Damour, Enfeh, Jieh, Joub Jannine, Jounieh, Khaldeh, Litani, Palm Islands, Qaraoun, and Tabarja. First recorded by Van Dyck in 1873-1878 (Kumerloeve 1960a, 1962).

***Arenaria interpres* Ruddy Turnstone pm:** Scarce but regular passage migrant, mid-February–May and August–October, along the coast and at inland waters. Most at Cheikh Zennad, Palm Islands, Tyre Coast and Qaraoun Lake. Only one record from Aammiq on 2 May 2001 (GR-J). First recorded by Tohmé & Neuschwander (1974).

***Calidris canutus* Red Knot v:** Only one record: one at Khaldeh pool on 2 April 1955 (Navins *in* Kumerloeve 1962).

***Calidris alba* Sanderling pm:** Five records: one at Beirut in late spring 1876 (Van Dyck *in* Kumerloeve 1962), four at Cheikh Zennad on 15 September 1996 and eight there on 29 September 1996 (Bara 1998), three at Cheikh Zennad on 22 September 2002, and six at Tyre Coast Nature Reserve on 6 October 2004 (Ramadan-Jaradi *et al* 2005).

***Calidris minuta* Little Stint PM:** Common passage migrant in flocks of up to several 100s in early March–late May and early August–late October on coasts, islands, and wetlands throughout the country. Sighted at Aammiq, Beirut, Bwar, Cheikh Zennad, Ghadir River mouth, Joub Jannine, Khaldeh, Litani River, Naqoura, Palm Islands, Qaraoun and Tyre Coast. First recorded in 1882 by Van Dyck (Kumerloeve 1962).

***Calidris temminckii* Temminck's Stint pm:** Scarce but regular passage migrant in late April–late May and mid-August–late October, mainly in Beqaa and to a lesser extent on coast, fishponds and estuaries. Reported from Aammiq, Beqaa Valley, Cheikh Zennad, Damour, Ghadir River mouth, Joub Jannine, Litani River, Naqoura, Palm Islands and Qaraoun Lake. First recorded by West (1954).

***Calidris ferruginea* Curlew Sandpiper pm, s:** Scarce but regular passage migrant in late April–May and August–October on coasts and wetlands throughout Lebanon. Very small numbers oversummer in June–July on Palm Islands. Perhaps more common than observations suggest (Ramadan-Jaradi & Ramadan-Jaradi 1999). Sighted at Aammiq, Beirut, Cheikh Zennad, Qaraoun Lake and Palm Islands. First recorded by Ramadan-Jaradi & Ramadan-Jaradi (1999).

***Calidris alpina* Dunlin PM, WV:** Common passage migrant in August–mid-November and to a lesser extent April–May on coasts, islands and inland wetlands. Regularly recorded in December–February on Palm Islands and occasionally or locally in smaller numbers elsewhere. Reported from Aammiq, Beirut, Cheikh Zennad, Chwaifat, Enfeh, Khaldeh, Naqoura, Palm Islands, Qaraoun, Tanayel and Tyre Coast. First recorded in 1875 by Van Dyck (Kumerloeve 1962).

***Limicola falcinellus* Broad-billed Sandpiper pm:** Scarce passage migrant. Recorded on 14 different dates between mid-April-late May and early August-early October 1996-2007, usually in small numbers varying between one and four, most at Cheikh Zennad, with a maximum of 18 there on 1 September 1996 (Bara 1998) and to a lesser extent at Qaraoun, Palm Islands and Yammouneh (G Ramadan-Jaradi in prep). First recorded in 1964 (Benson 1970).

***Philomachus pugnax* Ruff PM, wv, s:** Common to abundant passage migrant in mid-February–late May (chiefly March-April) and early August–mid-November (chiefly September), principally in the Beqaa Valley, coast and estuaries. Scarce winter visitor, in late November–mid February, mainly to Cheikh Zennad and Palm Islands. Very small numbers overwinter at Cheikh Zennad in June – July (Bara in Ramadan - Jaradi & Ramadan - Jaradi 1999). Reported from Aammiq, Beirut, Beqaa Valley, Cheikh Zennad, Damour, Naqoura, Palm Islands, Qaraoun and Tyre Coast. First recorded in 1878 by Van Dyck (Kumerloeve 1962).

***Phalaropus lobatus* Red-necked Phalarope pm:** Six records, none in breeding plumage: one juvenile on the coast near Zahrani on 3 August 1996 (Ramadan-Jaradi & Ramadan-Jaradi, 1999), one presumed adult at Palm Islands Nature Reserve on 17 August 2000 (Ramadan-Jaradi 2003), single juvenile at Cheikh Zennad on 22 July 2001 seen and photographed by Nidal Issa (pers comm), two juveniles there on 22 September 2002 (Ramadan-Jaradi & Waterbury unpub), one adult near Aana, south of Aammiq on 2 October 2003 (GR-J), and one at Cheikh Zennad on 21 September 2003 (Marc Almecija pers comm). These records suggest that the Red-necked Phalarope is probably a rare passage migrant rather than vagrant (G Ramadan-Jaradi in prep).

***Glareola pratincola* Collared Pratincole pm:** Uncommon passage migrant in April–May and mid-August–early November, mostly on coasts and islands. Reported from Aammiq, Beirut, Cheikh Zennad, Chwaifat and Palm Islands. First recorded in 1875 by Van Dyck (Kumerloeve 1962).

***Glareola nordmanni* (NT) Black-winged Pratincole pm:** Uncommon to rare passage migrant in April–May and mid-September–early October on islands, coasts, low montane areas (Dalhoun) and at Aammiq (Ramadan-Jaradi 1999). All subsequent records fall within the above periods. Sighted at Aammiq, Cheikh Zennad, Dalhoun, Palm Islands and Saida. First recorded in 1969 (Benson 1970).

5. Species of Gulls and Terns that may be subject for monitoring

***Larus hemprichii* Sooty Gull v:** One record: one near Tyre on 22 October 1958 (Flach 1959).

***Larus canus* Common Gull WV, pm, s:** Scarce passage migrant in March and early November–mid-December, and widespread and common winter visitor in December–late February, with small numbers overwintering in June–July off Tripoli. Sighted at Beirut, Palm Islands, Tripoli, Tyre and Naqoura. First recorded by Van Dyck in 1873-1878 (Kumerloeve 1960a, 1962).

***Larus audouinii* (NT) Audouin's Gull FB, pm:** Bred on Palm island in 1895 (Stenhouse 1904); 18 there but apparently not breeding on 3 April 1973 (Tohmé & Neuschwander 1974); seven more records at the same place: ten on 23 August 1997 (Ramadan-Jaradi & Ramadan-Jaradi 1999), one on 1, 4 and 25 April 1998 and one on 6 July 2000 (Ramadan-Jaradi & Ramadan-Jaradi 2001); three on 4 April 2002 and four on 11 August 2004 (GR-J). Elsewhere: three off Beirut on 3 October 1958 (Flach 1959), five at Cheikh Zennad on 25 August 1996 (Bara 1998), six there on 5 April 2002 and 14 on 1 September 2003 (Ramadan-Jaradi 2003). These records above suggest that the Audouin's Gull is a rare passage migrant rather than vagrant.

***Larus marinus* Great Black-backed Gull pm, vv:** Extremely rare passage migrant and winter visitor. The first part of Benson's (1970) statement that "a few are seen offshore here in most seasons, chiefly immature birds in autumn and winter" appears unlikely given the pattern of records elsewhere in this part of the Middle East. Singles off Antelias on 7 April and 12 December 1995, off Beirut on 15 March 1996, on Palm Islands on 5 May 1996 (Ramadan-Jaradi & Ramadan-Jaradi 1999) and 14 at Cheikh Zennad on 22 September 2002 (Ramadan-Jaradi & Waterbury unpub). First recorded by Schrader (1892).

***Larus michahellis* Yellow-legged Gull R, PM, WV, S:** Resident breeder (eggs mid-April, except for 2007 when first chicks hatched on 12 April) in fair numbers on Palm Islands (see Ramadan-Jaradi & Ramadan-Jaradi 1997, 1999, 2001). Fairly common passage migrant in March–mid-May and mid-August–early November; a relatively common winter visitor in mid-November–late February, and not uncommon non-breeding summer visitor in May–July. Occasional at inland wetlands. First recorded by Tristram (1864) and first breeding record was on Palm Islands in 1956 (Hollom 1959). Recently breeding was reconfirmed (for over 36 years) at Palm Islands in 1996 (Ramadan-Jaradi & Ramadan-Jaradi 1997, 1999, 2001).

***Larus armenicus* Armenian Gull v:** Four records: four at Tyre on 11 October 1996 (Ramadan-Jaradi & Ramadan-Jaradi 1999), eight at Cheikh Zennad on 22 March 1997 with one there on 5 April 1997 (Bara 1998) and [significant numbers were reported from Qaraoun Lake on 25 January 2001 - see Balmer & Betton (2001)].

***Larus cachinnans* Caspian Gull vv, ?pm:** One recorded at el Mina/Tripoli on 9 November 2004 (Nidal Issa pers comm), [a few adults and immature at Cheikh Zennad on 30 January 1998 were thought to be this taxon (TB)], and one adult observed and photographed at Palm Islands on 25 January 2008, following an intensive search since 13 January. The latter showed whiter spots on the black wing tip than the Yellow-legged Gull *L. michahellis*, paler grey upperparts, more flattened front, pinkish legs and black eyes (GR-J). Prior to the elevation of the Caspian Gull to the rank of species, most birders were not applying the ID criteria for the two forms. Nevertheless, few past photographs showed Caspian Gull characters clearly enough. Future observations will doubtless confirm the status of this species.

***Larus fuscus* Lesser Black-backed Gull PM, WV, s:** Abundant passage migrant (only ssp *fuscus*) in early March–late May and mid-August–early November, and common winter visitor in mid-November–mid-March along coasts and offshore. (Ramadan-Jaradi & Ramadan-Jaradi 1999). Vagrant at Aammiq wetland (Beale & Sprenger 2001). Very small numbers regularly overwinter.

in coastal areas, particularly at Palm Islands. Reported from Aammiq, Beirut, Bwar, Byblos, Cheikh Zennad, Damour, Jiyeh, Jounieh, Nahr el Kalb mouth, Nahr Ibrahim mouth and Palm Islands. First recorded in 1824 (Hemprich & Ehrenberg (1833).

***Larus heuglini* Heuglin's Gull v:** Two records: two at Tripoli on 2 April 2001 (Marc Almecija pers comm) and one at the mouth of Beirut River on 6 January 2004 (Thierry Bara). Being insufficiently documented so far by the observers, this hard-to-identify species will necessarily be another candidate for the LBRC].

***Larus ichthyaetus* Great Black-headed Gull pm,wv:** Recently several records during October-April indicate that the Great Black-headed Gull is a scarce to uncommon passage migrant and winter visitor. Previously, it was considered vagrant with only five records (Ramadan-Jaradi & Ramadan-Jaradi 1999). Reported from Aammiq, Bellan Islet, Cheikh Zennad, Palm Islands, Qaraoun Lake, Ras Beirut, Ras el Chekaa, Saida, Tel el Akhdar, Tripoli and Tyre. First recorded in 1975 (Macfarlane 1978).

***Larus ridibundus* Common Black-headed Gull PM, WV:** Abundant passage migrant and winter visitor from August–late April with peaks in November–December when flocks of several 100s are present. Recorded on islands, coasts, fishponds, estuaries and irregularly at inland waters where usually less than ten at one site. First recorded by Van Dyck in 1873-1878 (Kumerloeve 1960a, 1962).

***Larus genei* Slender-billed Gull pm, wv:** Irregular spring passage migrant and winter visitor. Benson (1970) and Ramadan-Jaradi & Ramadan-Jaradi (1999) list few records. Recently: five offshore Tyre Coast on 11 April 2005 (GR-J) and four flew north past Tripoli on 3 Mar 2006 (Richard Prior pers comm). First recorded by Tristram (1864).

***Larus melanocephalus* Mediterranean Gull pm, wv:** Scarce and irregular passage migrant and winter visitor. Not uncommon offshore in autumn and winter (Benson 1970); recorded on seven dates in January (Nevins 1960, Macfarlane 1978), seven in February and five in March (Macfarlane (1978); two in December (Macfarlane 1978, [Balmer & Betton 2006]) and one record of two on 10 April 1997 (Busuttil *et al* 1998a). All observations are from Beirut. First recorded by Schrader (1892). The lack of records since 1997 is noteworthy, given its continuing presence in Cyprus waters. Has the reduction in sediment deposition in the Nile delta caused a long-term shortage of food for seabirds in the south-eastern Mediterranean?

***Larus minutus* Little Gull pm, WV:** Uncommon passage migrant September-November and March-mid-May with peaks up to 65 in April (GR-J), principally at Cheikh Zennad; and common winter visitor December-February, with peaks up to 100 in January (GR-J), on islands, coasts, estuaries and to a lesser extent at inland waters (Qaraoun and Yammouneh). Sighted at Aammiq, Beirut, Cheikh Zennad, Damour, Khaldeh, Palm Islands, Qaraoun, Qleiaat, Saida and Yammouneh. First recorded by Van Dyck in 1873-1878 (Kumerloeve 1960a, 1962).

***Rissa tridactyla* Black-legged Kittiwake v:** Recorded only from Ras Beirut: records in January (three), November (five) and December (eight) in 1974-1975 (Macfarlane 1978), and at Palm Islands Reserve on 15 February 1998 (Ramadan-Jaradi & Ramadan-Jaradi 1999).

***Gelochelidon nilotica* Gull-billed Tern pm:** Tristram's late 19th century report that the species was found on sand-spits and lagoons near Tyre and Beirut cannot be confirmed (see Kumerloeve 1962). With only two records at Qaraoun and Cheikh Zennad in 1996-97 (Bara 1998), the Gull-billed Tern was considered a vagrant (Ramadan-Jaradi & Ramadan-Jaradi 1999). Recently, four additional records suggest that the species is a rare passage migrant rather than vagrant: three among tern flocks at Mina/ Tripoli, on 14 January 2000, 11 at Cheikh Zennad on 31 March, with 13 there on 2 April 2001 (Marc Almecija pers comm); and two at Lake Qaraoun on 4 August 2005 (Colin Conroy pers comm).

***Sterna bengalensis* Lesser Crested Tern FB, e:** Bred on Palm island in 1895 (Stenhouse 1904). No subsequent records (Ramadan-Jaradi & Ramadan-Jaradi 1999).

***Sterna sandvicensis* Sandwich Tern pm, wv:** Extremely rare passage migrant and winter visitor in early August-mid-April to coasts (Ramadan-Jaradi & Ramadan-Jaradi 1999) and Palm Islands (Ramadan - Jaradi & Ramadan-Jaradi 2001). Sighted at Beirut, Byblos, Cheikh Zennad, Damour and Palm Islands. First recorded in 1878 by Van Dyck (Kumerloeve 1962).

***Sterna hirundo* Common Tern FB, PM:** Formerly bred on Palm Islands (Stenhouse 1904) but considered a vagrant by Cramp (1985). Presently, common passage migrant in early April-late May and early August-early October, on coasts and islands; only one early record – 21 February 1998 (see Ramadan-Jaradi & Ramadan-Jaradi 1999). Observed at Abdeh, Beirut, Cheikh Zennad, Jounieh, Khaldeh, Palm Islands, Tripoli and Naqoura. First recorded by Schrader (1892).

***Sternula albifrons* Little Tern FB, pm:** Bred on Palm Islands at the end of the 19th century (Stenhouse 1904) but no subsequent records until 11 at Cheikh Zennad on 14 June 1996, three there on 8 September 1996 and eight on 16 May 1997 (TB), one at Sanani island on 4 April 1998 (Ramadan-Jaradi & Ramadan-Jaradi 1999) and two at Qaraoun Lake on 27 September 2003 (GR-J). All these records suggest that the Little Tern is a very rare passage migrant rather than vagrant. First recorded in 1877 by Van Dyck (Kumerloeve 1962).

***Chlidonias hybrida* Whiskered Tern sb, pm:** Bred in 1995 and 1996 in a flood plain at Assi River (Ramadan-Jaradi & Ramadan-Jaradi 1997, 1999). Scarce on passage in April-mid-May and early August-late September at inland waters, on coasts and islands. Sighted at Aammiq, Assi River, Beirut, Bishmezzine, Palm Islands, Tanayel and Tyre Coast. First recorded by Tohmé & Neuschwander (1974) and the first breeding confirmed at the Assi River in 1995 (Ramadan-Jaradi & Ramadan-Jaradi 1997).

***Chlidonias leucopterus* White-winged Tern PM:** Not uncommon passage migrant in mid-March-mid-May and early August-late October at inland and coastal waters (Ramadan-Jaradi & Ramadan-Jaradi 1999). Reported from Aammiq, Cheikh Zennad, Khaldeh, Nahr el Kalb, Naqoura,

Palm Islands, Qaraoun, Kassimyeh, Tanayel and Yammouneh. First recorded in 1904 by Carruthers (Kumerloeve 1962).

***Chlidonias niger* Black Tern pm:** Between 1974 and 1998, there were eight records (Ramadan-Jaradi & Ramadan-Jaradi 1999). Recently, five records: one at Ras Beirut on 2 September 2001, three at Khaldeh on 11 August and one there on 2 October 2003, one at Bishmezzine on 3 April and singles at Naqoura on 9 September 2005 (GR-J). More recently, one at Aammiq on 25 April 2007 (Colin Conroy pers comm). Together, these records suggest a rare passage migrant, early August-mid October and April, rather than a vagrant species. Reported from Aammiq, Beirut, Bishmezzine, Cheikh Zennad, Khaldeh, Naqoura and Qaraoun. First recorded in 1974 (Macfarlane 1978).

***Stercorarius pomarinus* Pomarine Skua pm, wv:** Twenty records: twelve records at Ras Beirut in February, August–September and December 1974–1976 (Macfarlane 1978), one or two off Beirut on 10 April (Kirwan 1997), six there during 8–11 April 1997 (Busuttil & Flumm 1998a), one single at El Mina/Tripoli on 14 January 2000 (Marc Almecija pers comm), one off Palm Islands on 20 February 2001 and one off Beirut on 17 April 2001 (Ramadan-Jaradi & Ramadan-Jaradi 2002); and one single over Palm Islands on 11 May 2001 (Ramadan-Jaradi & Sandwith unpub). All these records show that the species is a scarce passage migrant and rare winter visitor rather than a vagrant (see Ramadan-Jaradi & Ramadan-Jaradi 1999). First recorded in 1974 (Macfarlane 1978).

***Stercorarius parasiticus* Arctic Skua pm, wv:** Recorded off Ras Beirut and Tripoli on 11 May, 21–28 August and 6 September 1974, 1975 (Macfarlane 1978), four at Ras Beirut on 10 April 1997 (Busuttil & Flumm 1998a), four birds off Ras Beirut during 8–11 April 1997 were either this species or Pomarine Skua (Ramadan-Jaradi & Ramadan-Jaradi 1999), one on Palm Islands on 21 February 1998 (Bara 1998), one was harassing gulls off Ras Beirut on 5 and 28 December 2005, and one was at Tripoli on 3 March 2006 (Richard Prior pers comm) and 11 above el Mina/Tripoli harbour on 30 January 2008 (GR-J), one off Ras Beirut on 27 December 2005 (Colin Conroy pers comm). With these records, the species is a rare passage migrant and rare winter visitor rather than a vagrant (see Ramadan-Jaradi & Ramadan-Jaradi 1999). First recorded in 1974 (Macfarlane 1978).

References

Boersma, P.D., J.A. Clark y N. Hillgarth. 2002. Seabird conservation. En: Schreiber, E.A. y J. Burger (Eds.): Biology of marine birds, pp. 559-579. CRC Press, New York.

CopeMed II. 2011. Report of the Working Group on Small Pelagic Fisheries Management in the Alboran Sea under the Ecosystem Approach to Fisheries.

Croxall, J., Rothery, P., 1991. Population regulation of seabirds: implications of their demography for conservation. In: Perrins, C.M., Lebreton, J.D., Hiron, G.M. (Eds.), Bird Population Studies, Relevance to Conservation and Management. Oxford University Press, Oxford, UK

Croxall, J.P., S.H.M. Butchart, B. Lascelles, A.J. Stattersfield, B. Sullivan, A. Symes y P. Taylor. 2012. Seabird conservation status, threats and priority actions: a global assessment. Bird Conservation International, 22: 1-34.

Cury et al. 2011. De Juana, E., J. Varela y H.H. Witt. 1984. The conservation of seabirds at the Chafarinas Islands. En: Croxall, J.P., Evans, P.G., & Schreiber, R.W. (eds). Status and conservation of the world's seabirds. pp. 363-370.

García-Barcelona, S., D. Macías, J.M. Ortiz de Urbina, A. Estrada, R. Leal & J.C. Báez. 2010a.

García-Barcelona, S., J.M. Ortiz de Urbina, J.M. de la Serna, E. Alot y D. Macías. 2010b. Seabird bycatch in Spanish Mediterranean large pelagic longline fisherie, 2000-2008. *Aquatic Living Resources*, 57: 65-78.

García-Barcelona, S., J. Fregenal, M.D. Santaella y L. Aleixos Alapont. 2010c. Resultados de las ICAOS en Málaga 2007-2010. VII Congreso del Grupo Ibérico de Aves Marinas, Santurtzi, Bizkaia, 30 y 31 de Octubre y 1 de Noviembre de 2010.

Lewison, R., D. Oro, B. Godley, L. Underhill, S. Bearhop, R.P. Wilson, D. Ainley, J.M. Arcos, P.D. Boersma, P.G. Borboroglu, T. Boulinier, M. Frederiksen, M. Genovart, J. González-Solís, J. A. Green, D. Grémillet, K. C. Hamer, G.M. Hilton, K. D. Hyrenbach, A. Martínez-Abraín, W. A. Montevecchi, R. A. Phillips, P. G. Ryan, P. Sagar, W. J. Sydeman, P. Yorio, S. Wanless, Y. Watanuki, y H. Weimerskirch. 2012. Research priorities for seabirds: Improving seabird conservation and management in the 21st century. *Endangered Species Research* 17: 93-121.

Louzao, M., J.M. Igual, M. McMinn, J.S. Aguilar, R. Triay y D. Oro. 2006a. Small pelagic fish, trawling discards and breeding performance of the critically endangered Balearic shearwater: improving conservation diagnosis. *Marine Ecology Progress Series*, 318: 247-254.

Louzao, M., K. Delord, D. García, A. Boué y H. Weimerskirch. 2012. Protecting Persistent Dynamic Oceanographic Features: Transboundary conservation efforts Are Needed for the Critically Endangered Balearic Shearwater. *PLoS One* 7 (5): e35728.

Ramadan Jradi ,G. & Ramadan Jaradi ,M. (2001).- The Avifauna of Palm Islands Reserve Lebanon 1893 to 2000. *Lebanese Science Journal*. Vol. 2, No.1, 2001:17- 35.

Ramadan Jaradi, G., Bitar, G., Halwani, J., Sabbagh, H. (2001). Impact of management activities on birds, fishes, plants and water quality on Palm Islands Reserve., *UNESCO CAIRO OFFICE*, pp: 1- 69.

Ramadan Jaradi, G., M. Haber, R. Sadek and I. Saoud 2007. Biodiversity Assessment and Monitoring in the Palm Island Nature Reserve. AUB, MOE. IUCN.

Ramadan Jaradi, G. & Bara, T. and Ramadan Jaradi, M. (2008) Revised checklist of the birds of Lebanon 1999-2007. *Sandgrouse* 30 (1): 22-69.

Ramadan Jaradi, G., Bara, T. (2008) First confirmed breeding record of Spur-winged Lapwing *Vanellus spinosus* for Lebanon. *Sandgrouse* 30 (2).

Ramadan Jaradi Ghassan (2010). Rehabilitation of Economic Functions of War-damaged Palm Islands Nature Reserve (PINR) Lebanon. Obtained on 20/12/2010 the Prize of KSA for the best environmental management in Arab countries that was organized by the Arab League States.

Ramadan-Jaradi, Ghassan. 2017. Status and distribution of migrating and breeding Marine birds in North Lebanon. *Lebanese Science Journal*. Vol. 18, No. 2: 156-165.

Weimerskirch, H. 2002. Seabird demography and its relationship with the marine environment. En Schreiber, E.A. y J. Burger (Eds.): *Biology of Marine Birds*, pp. 115-135.

UNEP/MAP - RAC/SPA, 2012. *Guidelines for Management and Monitoring Threatened Population of Marine and Coastal Bird Species and their Important Areas in the Mediterranean*. By Joe Sultana. Ed. RAC/SPA, Tunis. 24pp.

UNEP-MAP-RAC/SPA. 2014. *Status of Seabirds in the Alboran Sea*. By J.M.Arcos. Draft internal report for the purposes of the Mediterranean Regional Workshop to Facilitate the Description of Ecologically or Biologically Significant Marine Areas, Malaga, Spain, 7-11 April 2014.

UNEP-MAP-RAC/SPA, 2017. *Monitoring marine and coastal birds in Palm Islands Nature Reserve (SPAMI/2012) and its surroundings*; by: [Ghassan RAMADAN/JARADI/PINRC, *MOU no48 SPA/RAC_2016*, SPA/RAC, Tunis, 27 pp.