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Résumé

La Réserve Naturelle des îles des Palmiers (PINR) se situe entre 35° 44' 30"- 35° 47' de longitude Est et 34° 29' - 34° 30' 33" de latitude Nord. La réserve se situe à 5,5 km des côtes de Tripoli/El Mina. Sa superficie (y compris 500 m de mer autour des îles) est de près de 4,2 km² (périmètre de 5,18 km ; zone maritime : 3,95 km², zone terrestre de 25,6 ha).

Les îles des Palmiers sont une propriété publique. Elles ont été déclarées aire protégée en vertu de la Loi 121 du 9 mars 1992. La réserve est également incluse dans la liste des Zones humides d'importance internationale dans le cadre de la Convention Ramsar du 3/8/2001 (site N° 1079), aire spécialement protégée et zone importante pour la conservation des oiseaux.

La PINR se compose de trois îles sablonneuses et rocheuses planes :

➤ **L'île Palmier** (également connue sous la dénomination d'île des Lapins ou d'île Nakhl). L'île Palmier est la plus grande des trois îles couvrant une superficie de 200.000 m² (périmètre 1,78 km), elle est plane et sans relief évident. Son point culminant n'est que de 6 m au-dessus du niveau de la mer. La partie médiane en terre sépare une rive rocheuse qui s'étend du nord-ouest au sud et une plage sablonneuse qui s'étend du nord à l'est. L'île comprend des vestiges de périodes anciennes d'occupation humaine sous forme de puits d'eau douce, d'anciennes salines et les vestiges d'une ancienne église qui remonte à la période des Croisades. Des signes de travaux récents effectués afin de réhabiliter l'île ont été observés. Le puits a été nettoyé et l'eau a été utilisée pour irriguer les 570 palmiers plantés sur l'île. Un chemin de randonnée et un quai pour des bateaux ont été construits et des zones de recherche et de loisirs ont été délimitées.

➤ **L'île Sanani** couvre une superficie de 40.000 m² (périmètre de 1,37 km) au sud-est de l'île Palmier. Essentiellement rocheuse, avec une rive en partie sablonneuse, semblable à celle de L'île Palmier.

➤ **L'île Ramkine** (également connue sous le nom d'île Fanar). La plus petite des îles possède une superficie de 16.000 m² (périmètre de 2,03 km) et est située au nord-ouest de l'île Palmier. L'île Ramkine est essentiellement rocheuse et s'élève à près de 12 m au-dessus du niveau de la mer. L'île comporte les restes d'un phare en plus d'emplacements de canons et de galeries souterraines construites au début du XXème siècle. Récemment, des feux de navigation à l'énergie solaire ont été installés dans la tour de l'ancien phare.

Le sous-sol rocheux des îles est essentiellement constitué de strates horizontales de calcaire marin, que M. René Wetzel a interprété comme étant des dépôts du Miocène, sur la carte géographique de Tripoli. Sur le plan géomorphologique, le calcaire présente des caractéristiques karstiques typiques en raison de l'érosion marine et aérienne des terres émergées.

Le climat de la PINR peut être assez justement décrit comme l'étage bioclimatique tempéré méditerranéen avec une variante thermique d'hiver froid, et une moyenne annuelle de pluviométrie de 930 mm.

Il est possible d'accéder à l'eau potable au moyen des puits, de l'eau de pluie accumulée ou des sources dans la mer.

Les habitats des îles sont de trois types terrestres (rocheux, sablonneux et de terre) et de sept types marins (supralittoral, médiolittoral et infralittoral sablonneux ; supralittoral, médiolittoral et

infralittoral rocheux ; et infralittoral sablonneux avec un herbier sous-marin).

La liste des espèces régionalement protégées par les accords internationaux comprend 3 plantes marines, 11 espèces de mollusques, 3 tortues marines, 13 espèces d'oiseaux et 3 espèces de mammifères.

Malgré le fait que la PINR soit inhabitée, elle reste un lieu d'attraction pour les activités de loisirs (nage dans des eaux non polluées, bronzage, plongée sous-marine et randonnées), pédagogiques et de recherche. La pêche et la chasse n'y sont pas autorisées et le sable de la plage est utilisé à des fins thérapeutiques. Très rarement, des femmes cueillent des plantes culinaires ou médicinales.

Le zonage spatio-temporel de la réserve est effectué en vue d'atténuer l'impact des visiteurs et des chercheurs sur les habitats et les espèces de la réserve.

Il s'agit d'une réserve typique de Méditerranée, d'une grande importance pour de nombreuses raisons. L'ensemble de la réserve constitue un site d'escale pour 156 espèces d'oiseaux migrateurs et hibernants qui l'utilisent pour des raisons alimentaires, pour se reposer, comme abri et comme gîte. Parmi ces espèces, il existe des espèces mondialement menacées qui méritent d'être préservées. La plage des îles qui est propre et sûre, est idéale pour la ponte des tortues, d'autant que de telles conditions n'existent pas sur la majorité des plages du continent. Les îles disposent de plages sablonneuses composées de fragments de coquillages et utilisées par la communauté locale à des fins thérapeutiques. Les îles possèdent 83 espèces de plantes (dont deux endémiques) qui étaient très répandues dans le passé sur la plage du continent mais qui ont disparu de nos jours en raison de la pression démographique. Les plantes des îles témoignent de la flore des plages du passé au Liban. L'habitat insulaire rocheux est essentiel à la reproduction des goélands. Il constitue le seul lieu au Liban et de la région de méditerranée orientale où les oiseaux marins se reproduisent.

Les habitats insulaires :

- Sont importants pour la colonie d'oiseaux aquatiques de Goélands leucophée mais également autrefois pour le Goéland d'Audouin menacé au plan mondial.
- Présentent des plages sablonneuses paisibles et propres où se reproduit la tortue caouanne menacée mondialement
- Semblent présenter dans leurs environs des milieux appropriés à l'hivernage de la tortue verte mondialement menacée.
- Constituent jusqu'à aujourd'hui un refuge pour le phoque moine (filmé) mondialement menacé.
- Comportent un bivalve important, le *Brachidontes pharaonis*, un vermet formant d'importantes et d'intéressantes plateformes dans les zones des rives rocheuses des îles des Palmiers (Bitar 2008), essentiellement dans l'île Ramkine (*obs. pers.*).

L'intérêt pédagogique de la réserve réside dans la biodiversité des oiseaux de mer insulaires, les halophytes qui résistent au vent, l'impact des courants marins sur les îles et le rôle des vermetes sur la protection des roches le long du rivage.

L'intérêt scientifique réside dans l'utilisation de la réserve comme escale importante pour les oiseaux migrateurs qui traversent la mer. Il s'agit de l'unique site au Liban pour la reproduction des oiseaux de mer, la survie sur les îles de plantes qui n'existent plus sur le littoral de la Méditerranée orientale, notamment des espèces menacées et endémiques ; l'observation et la suivi aisés des tortues marines menacées et les plots de suivi de la diversité marine et des habitats bien protégés.

Sur le plan esthétique, l'île Ramkine, ainsi que l'ancienne structure du phare, sont considérées ressembler à un navire voguant sur la mer, le Mont Liban enneigé que l'on aperçoit depuis la

plage de sable de l'île Palmier est considérée comme une vue nationalement unique, les goélands immobiles au coucher du soleil sur les rochers de l'île Sanani semblent être des rangées de dents (donnant ainsi probablement le nom à cette île).

L'intérêt culturel de la réserve pourrait résider dans les ruines de l'église des Croisés du XII^{ème} siècle de l'île des Lapins/Nakhl, de même que dans son puits d'eau douce taillé dans la roche, les vestiges du phare et les deux supports de canons français du début du XX^{ème} siècle sur l'île Ramkine/Fanar, les ruines des salines représentant les modes traditionnels d'extraction du sel et une variété de fragments de poterie.

Il existe 4 types d'activités humaines qui ont des répercussions sur la réserve : le dynamitage limité illégal pour la pêche près des îles de la réserve. Ce comportement a affecté les roches périphériques des îles qui sont sujettes à des fissures et des immersions ; la collecte illégale de coquillages par les plongeurs des villages voisins des alentours des îles, à des fins commerciales. Ce type de collecte détruit la chaîne alimentaire autour de la réserve et très probablement en son sein ; le grand nombre de visiteurs pendant la période estivale peut créer une pollution et détruire le couvert végétal de la zone du supralittoral, notamment les plantes qui jouent un rôle dans la fixation des dunes ; les lapins introduits en 1982 causent une dégradation continue du couvert végétal, ce qui débouche sur une dynamique progressive répétée exceptionnelle de la végétation ; et l'ancrage d'un nombre considérable d'embarcations en été détruit la zone de l'infralittoral.

La PINR est couverte par un plan de gestion élaboré pour la période 2000-2005, actualisé pour la période 2008-2013 et complété par des lignes directrices relatives à la gestion des îles des Palmiers en 2009 par Tragsa (une entreprise espagnole) afin de guider la gestion de la réserve.

Le nombre de visiteurs augmente en fonction du développement démographique. Ainsi, il est prévu que plus de dommages se produiront en raison des déplacements des visiteurs, du mouillage des embarcations et des déchets produits.

La PINR est protégée par la Loi 121/92 pour la protection de la biodiversité, la réhabilitation des processus écologiques et la promotion de l'éducation et de la recherche environnementales. Elle a également été déclarée zone humide d'importance internationale par le Carpe/PNUE (1980), ZICO (zone importante pour la conservation des oiseaux (Birdlife 1994), ASP (aire spécialement protégée (1995), et site Ramsar (2001). Toutefois, la Loi prévoit, parallèlement au plan de gestion de la réserve, toutes les dispositions nécessaires relatives à l'application des Articles 6 et 17 de même que de la section D5, D6, D7 et D8 du Protocole.

La PINR est gérée par le Ministère de l'Environnement en coopération avec le Ministère des Travaux publics et des transports pour la direction du phare, le Ministère de l'Agriculture pour le contrôle du secteur de la pêche et le Ministère de la Défense pour patrouiller dans la zone et empêcher les activités de braconnage. Le Comité de l'aire protégée nommé (APAC) créé par décision du Ministère de l'Environnement, se compose de représentants de : la Municipalité de Tripoli, la Municipalité de Mina, l'Université libanaise – Ornithologie, l'Université Balamand – Océanologie, le Comité de protection de l'environnement (ONG), l'Union des ONG du Nord du Liban et l'Ordre de la pêche.

Des gardes-forestiers et des patrouilleurs constituent les principaux moyens de protection afin de surveiller et de contrôler les visiteurs et les braconniers, à condition que la situation financière de la réserve soit appropriée. La crainte viendrait des tensions politiques potentielles qui pourraient réduire les capacités financières de l'APAC et, par conséquent, de ses activités.

Les pénalités existantes (Articles 6, 7, 8 et 9 de la Loi 121/92) donnent le pouvoir requis afin de conserver et de protéger efficacement la PINR et suffisent à dissuader les infractions.

Le Ministère de l'Environnement a décaissé des fonds auprès de l'APAC afin d'appuyer la gestion de la PINR par le biais de Comités publics nommés mais un examen des décaissements totaux de 2001 à 2008 indique que les allocations constituent le financement principal du personnel de base et de l'entretien des infrastructures. Quant à la mise en œuvre du plan, l'allocation est modérée. Afin de résoudre ce problème, le comité de gestion a utilisé des projets financés par les Ambassades, les agences de développement, les bailleurs étrangers et locaux, en vue de mettre en œuvre les activités de conservation et d'améliorer les services offerts aux visiteurs.

Rapport de présentation soumis

Acronyms:

APAC	Appointed Protected Area Committee
EIA	Environmental Impact Assessment
IBA	Important Bird Area
IEE	Initial Environmental Examination
MOA	Ministry of Agriculture
MOD	Ministry of Defence
MOE	Ministry of Environment
MOPWT	Ministry of Public Works and Transport
NCSR	National Center for Scientific Research
NGO	Non Governmental Organisation
PA	Protected Area
PINR	Palm Islands Nature Reserve
SPA	Specially Protected Area
SPAMI	Specially Protected Areas of Mediterranean Importance
TRAGSA	Spanish enterprise named Tragsa

1. AREA IDENTIFICATION

1.1. COUNTRY/COUNTRIES (in the case of transboundary areas)

LEBANON

1.2. ADMINISTRATIVE PROVINCE OR REGION

MINA/ TRIPOLI/ MOHAFAZAT (GOVERNORATE) OF NORTH LEBANON

1.3. NAME OF THE AREA

PALM ISLANDS NATURE RESERVE
MINA-TRIPOLI

1.4. GEOGRAPHIC LOCATION

Describe its geographical boundaries, e.g. rivers, roads, geographical or administrative boundaries (do not describe the co-ordinates here; please make a separate annex with a map and a description of geographical co-ordinates as stated in the legal declaration of the area).

The reserve is situated at 5.5 km north-west of the shore of Mina in Tripoli. These flat rocky-sandy islands include the Palm (or Rabbit) island, Sanani island, and Ramkine (or Fanar) island. They form with their 500 meters belt of surrounding sea the nature reserve (Figure 1) where the central Palm island is distant 600 meters from Sanani to the south-east and another 600 meters from Ramkine to the north-west.

1.5. SURFACE OF THE AREA (total)

4.2 (in Km ²)	420 (in ha)
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1.6. LENGTH OF THE MAIN COAST (Km)

1.37 for Sanani	Total= 5.18 km
1.78 for Rabbit	
2.03 for Ramkine	

2. EXECUTIVE SUMMARY (maximum 3 pages)

The Palm Islands Nature Reserve (PINR) lies between longitude 35° 44' 30"- 35° 47' East and Latitude 34° 29' - 34° 30' 33" North. The reserve is situated at 5.5 km from the shore of Tripoli/ El-Mina; its overall area (including 500m of sea surrounding the islands) is about 4.2 Km² (perimeter 5.18 km; marine area: sq km 3.95, terrestrial area 25.6 ha).

The Palm Islands are public property and declared protected area by Law 121 on 9 March 1992. The reserve is also included in the list of Wetlands of International Importance under the Ramsar Convention in 3/8/2001 (site No. 1079), Specially Protected Area and Important Bird Area.

PINR comprises three flat sandy-rocky islands:

Palm Island (also known as Rabbit Island or Nakhl Island)

Palm Island is the largest of the three islands, covering an area of 200.000 m² (perimeter 1.78 km) and is flat with no obvious relief; its highest point is only about 6m above sea level. The earthen middle separates a rocky shoreline extending from the northwest to south, and a sandy beach extending from the north to the east. The island contains evidence of past periods of human occupation in the form of a fresh water well, old salinas and the remains of an old church that date back to the Crusader period. There are signs of recent work that has been done to rehabilitate the island. The well was cleaned and the water used to irrigate 570 palm trees planted on the island. A walking trail and a dock for boats have been constructed and areas for research and recreation have been demarcated.

Sanani Island covers an area of 40.000 m² (perimeter 1.37 km) southeast of Palm Island. Mainly rocky with a partially sandy shore that resembles that of Palm Island.

Ramkine Island (also known as Fanar Island) is the smallest island, with an area of 16,000 m² (perimeter 2.03 km) and located northwest of Palm Island. Ramkine Island. It is mostly rocky and rises to about 12 meters above sea level. The island contains the remains of a lighthouse in addition to cannon emplacements and underground galleries that were built early in the twentieth century. Recently, solar powered navigation light has been installed in the tower of the old lighthouse.

The rocky basement of the islands is mainly horizontally bedded marine limestone interpreted as Miocene deposits by M René Wetzel in the geological map of Tripoli. Geomorphologically, the limestone presents typical karstic features due to marine and emerged aerial erosion.

The PINR climate may be fairly described as Temperate Mediterranean Bioclimatic Stage with thermic variant of cool winter, with an annual rainfall average of 930 mm.

Fresh water is accessed in wells, accumulated rain water or springs in the sea.

The habitats of the islands are of 3 terrestrial types (rocky, sandy and earthen) and 7 marine types (sandy supralittoral, mediolittoral and infralittoral; rocky supralittoral, mediolittoral and infralittoral; and sandy infralittoral with sea grass.

The list of regionally protected species by international agreements comprises 3 marine plants, 11 mollusca species, 3 marine turtles, 13 bird and 3 mammal species.

Despite the fact that the PINR is uninhabited, it remains a site of attraction for recreational (swimming in non polluted water, sun bathing, scuba diving, and hiking), educational and research activities. Fishing and hunting are not allowed, whereas the sand of the beach is used for therapeutic purposes. Very seldom, women pick up some culinary or medicinal plants.

Zonation of the reserve in time and in space is made to mitigate the impact of visitors and researchers on the habitats and species of the reserve.

The reserve is typical Mediterranean and is of high significance for many aspects. The whole reserve is a stopover site for 156 migrating and wintering bird species which use it for fueling, resting, sheltering and roosting. Among these there are some globally threatened species that deserve conservation. The islands' beach which is clean and safe, is ideal for turtle nesting whilst such conditions are not provided on most of the continental beaches. The islands have sandy beaches made out from shell fragments and used by local community for therapeutic reasons. The islands have 83 plant species (including two endemic) that once were widespread on the continental beach but nowadays extinct due to demographic pressure. The plants on the islands witness the past beach flora of Lebanon. The rocky insular habitat is essential for the breeding of gulls. It constitutes the only place in Lebanon and east Mediterranean area where sea birds do breed.

The islands habitats are:

- Important for the water-bird colony of Yellow-legged Gull but formerly for the globally threatened Audouin's Gull too.
- With undisturbed and clean sandy beaches where the globally threatened Loggerhead do regularly breed
- apparently appropriate good islands' surroundings to wintering to the globally threatened Green Turtle.
- until today a refuge for the globally endangered Monk seal (filmed).
- with important bivalve *Brachidontes pharaonis* that is a vermetid forming important and interesting platforms in rocky shore areas of Palm Islands (Bitar 2008), chiefly Ramkine island (*pers. obs.*).

The Educational interest of the reserve comprises sea bird insular biodiversity, halophytes wind resistant, sea currents impact on islands and role of vermetids in protecting rocks along the shore.

The scientific interest comprises the use of the reserve as a hot stopover by sea crossing migratory birds and as the only site in Lebanon for sea birds breeding, the survival on islands of plants that are not anymore found on the eastern Mediterranean littoral, including threatened and endemic species; the easy observation and monitoring of the threatened marine turtles and the well protected monitoring plots of marine diversity and habitats.

Esthetically, the Ramkine island together with the old lighthouse structure is said to resemble a ship sailing in the sea, the snow-capped Mount Lebanon viewed from Palm Island's sandy beach is considered a nationally unique view, the gulls standing at sunset on the rocks of Sanani island appear like rows of teeth. (probably giving rise to the name of the island.).

The cultural interest of the reserve may be represented by the ruins of the Crusaders' church of the twelfth century on the Rabbit/ Nakhl Island together with its freshwater well that is carved in the rocks, the Lighthouse ruins and the associated two French Cannon-mounting sites of the early twentieth century on the Ramkine/ Fanar, the Salinas ruins representing the traditional ways of extracting salt, and the variety of pottery fragments.

The human activities that impact the reserve are generally 4 types: limited illegal dynamiting for fish harvesting near the islands of the reserve. This behavior has affected the peripheral rocks of the islands which became subjected to cracks and drowning; illegal collection of sea shells by divers of neighboring villages from the reserve's

surrounding for commercial business. This type of taking destroys the food chain around the reserve and most probably within its boundary; the large number of visitors during the summer recreational time may create pollution and destroy the vegetation cover of the supra-littoral zone, especially those plants which play a role in fixing the dunes; the introduced rabbits in 1982 cause continuous degradation to the vegetation cover, a matter that leads to an exceptional repeated vegetation progressive dynamic; and the anchoring of the huge number of boats in summer time destroys the infra-littoral zone. The PINR is covered by a management plan that was developed for the period 2000-2005 and updated for the period 2008-2013 and complemented by guidelines for the management of Palm Islands in 2009 by Tragsa (Spanish enterprise) to guide the management of the reserve.

The number of visitors increases in correlation with the demographic development. Thus it is expected that more damage will occur from stepping, anchoring, and waste generated.

PINR is protected by Law 121/92 that seeks protection of biodiversity, rehabilitation of the ecological processes and promotion of environmental education and research. It is also declared a Wetland of International Importance by Carp/UNEP (1980), IBA (Important Bird area (Birdlife 1994), SPA (Specially Protected Area (1995), and Ramsar site (2001). However, the Law provides beside the management plan of the reserve all provisions necessary to apply the Articles 6 & 17 as well as the Section D5, D6, D7, and D8 of the Protocol.

PINR is managed by MoE in cooperation with MoPWT for running the lighthouse, the MoA for controlling the fishing sector and MoD for patrolling the area and inhibiting poaching activities. The Appointed Protected Area Committee (APAC) established through a decision from the Minister of Environment, is formed from representatives of: Municipality of Tripoli, Municipality of Mina, Lebanese University – Ornithology, Balamand University – Oceanology, Environment Protection Committee (NGO), Union of NGOs of the North Lebanon, and the Fishing Order.

Rangers and patrols are the essential protection means to protect and survey and control visitors and poachers provided the financial situation of the reserve is appropriate. The fear is from potential political tension which may reduce the financial ability of the APAC and subsequently its activities.

The existing penalties (Articles 6, 7, 8 and 9 of the Law 121/92) provide the power needed to effectively conserve and protect the PINR and are sufficient to dissuade infractions.

MoE has been

disbursing funds to APAC to support the management of the PINR through Appointed Government Committees but a review of total disbursements from 2001 through 2008 shows that the allocations are a core funding for basic staff and infrastructure maintenance. As for the implementation of the management plan, the allocation is moderate. In order to solve this issue, the managing committee used projects funded by Embassies, development agencies, foreign and local donors to implement conservation activities and to improve services to visitors.

3. SITE DESCRIPTION

3.1. TYPOLOGY OF THE SITE

3.1.1. Terrestrial surface, excluding wetlands (ha):		25.6 ha
3.1.2. Wetland surface (ha):		0.3 ha rain ponds
3.1.3. Marine surface (Sq. Km):	Marine internal waters	N/A
	Territorial sea	3.95 Sq. Km
	High sea	N/A

3.2. MAIN PHYSICAL FEATURES

3.2.1. Geology/Geomorphology

Give a brief description of: (i) geological aspects (lithologic and tectonics); (ii) processes of sedimentation and erosion observable in the area; (iii) coastal geomorphology and (iv) island system. Indicate bibliographical sources.

The rocky basement of the islands is mainly horizontally bedded marine limestone interpreted as Miocene deposits by M René Wetzel in the geological map of Tripoli. However, no tectonic features are visible in this limestone to distinguish it from the Miocene limestone of Jabal Terbol, Nahr el Kalb, or Ashrafieh. With the lack of fossil evidence, and with its regular sedimentation, this limestone could be interpreted to be more likely from the Plio-Quaternary age (Ramadan-Jaradi *et al.* 2004).

The “sandy” shore and dunes of two of the islands has the peculiarity of a biological origin. It is mostly represented by the skeletons of marine benthic foraminifera, resulting in very light “sand” with an admixture of tiny gastropod shells and parts of skeletons and spines of echinoderms. The “sandy” shore differs in extent throughout the year, being reduced during bad weather and influenced by the direction of water currents (Ramadan-Jaradi, *pers. unpubl.*).

Geomorphologically, the limestone presents typical karstic features due to marine and emerged aerial erosion. In both cases open gutters can be seen, wide and open in the case of marine erosion, narrower in higher places. All around the islands there are bare rocky exposures as a result of marine erosion in the form of dissolution and physical action of the waves. ‘Sand’ dunes form the higher parts of Palm Island and are the location of evidence of human occupation (Ramadan-Jaradi *et al.* 2004).

Lithosols are mainly represented in rocky sections of the islands, plants finding very few muddy particles at the bottom of gutters. Some muddy deposits maintain superficial sweet waters in the larger pools where dulci-aquatic plants develop in ephemeral wetlands formed from rainwater in winter and spring.

The only significant soil development on the islands is developed from eolian and beach deposited calcareous sands. Much of the western part of Palm Island has significant depths of sandy soils. Soils elsewhere on the island range from non-existent to small-localized accumulations of sandy and organic soils.

Ramadan-Jaradi *et al.* 2004: Ramadan Jaradi, G., Tohmé, G., and Hraoui, S. (2004). Biodiversity Assessment and Monitoring in the Protected Areas Lebanon LEB/95/G31 Palm Island Nature Reserve. Ministry of Environment (MoE)/ Lebanese University, 115 p.
www.moe.gov.lb/ProtectedAreas/publications/Final-ReportPalm.pdf

3.2.2. Other interesting physical features: Such as hydrodynamics, volcanic formations, caves, underwater formations, etc.

Marine waters are mainly represented in a lot of pools on the seaside of the rocky shore. During winter, sweet (fresh) water fills the narrow pools of the diachases and some larger pools within the dunes. By digging in the dunes some freshwater can be obtained even in summer (Ramadan-Jaradi, *pers. com.*).
In the other hand, the submerged caves of Ramkine Island offer many species an appropriate place for breeding or sheltering during difficult times.

3.2.3. Length of beaches (in Km), including islands:

a) Length of sandy beaches:

0.95 km

b) Length of pebble or stony beaches:

N/A

c) Length, height and depth of active sand-dunes:

0.28 km x height
3m

3.3. FRESHWATER INPUTS

3.3.1. Mean annual precipitation (in mm)

The annual rainfall average is 930 mm.
Rainfall is concentrated in the winter months from October through April and apparently rainless the other months of the year (Ramadan-Jaradi *et al*, 2004)

3.3.2. Main water courses (permanent and seasonal)

N/A

3.3.3. Estuarine areas: Existence and brief description

N/A

3.3.4. Freshwater springs: Existence and brief description, including marine offsprings

Freshwater is either of no direct access (well of the Crusader's time) or simply limited to small temporary ponds of rain water in winter and spring seasons (Figure 2). The surrounding sea shows several freshwater springs (Tragsa 2009).

Tragsa (2009).Guidelines for the management of Palm Islands.Tragsa, Aecid, Ministry of Environment. Beirut.

3.4. BIOLOGICAL FEATURES (B2, Annex I)

3.4.1. Habitats: A brief description of dominant marine and terrestrial habitats, on the basis of the habitat classifications adopted within the framework of MAP (and their coverage in ha)

Terrestrial (see full list in Annex 4):

* **The rocky shoreline formation** associated with *Arthrocnemum macrostachyum*, *Crithmum maritimum*, *Inula crithmoides*, *Frankenia hispida*, *Limonium angustifolium* and *Limonium sieberi*

* **The sandy beach formation** associated with *Euphorbia paralias*, *Euphorbia peplis* and *Cakile aegyptia*, *Eryngium maritimum* and *Pancratium maritimum*

* **The earthen and stony formation** associated with *Papaver rhoeas*, *Papaver syriacum*, *Aristolochia parvifolia*, *Campanula stellaris*, *Glaucium flavum*, *Minuartia thymifolia syriaca* and *Anemone coronaria* (Ramadan-Jaradi *et al.* 2004)

Marine:

The **sandy Supralittoral habitat** with poor biocenosis of sands and with Facies of phanerogams which have been washed ashore (upper part). The species which inhabit the sandy supra-littoral (gastropods and crustaceans) usually have the habit of feeding on detritus, eating remains the sea throws up on the beach.

The **rocky supralittoral habitat** with a variety of algae and macrofauna: *Patella caerulea*, *Patella sp.*, and *Chthamalus montagui*.

The **sandy mediolittoral habitat** has more abundant fauna than the sandy supralittoral, made up, mainly, of mobile polychaete worms and crustaceans which live between the grains of sand.

The **rocky mediolittoral habitat** with 9 different species of algae like *Dictyota fasciola*, *Corallina elongate*, *Enteromorpha sp.*, *Cladostephus verticillatus*, *Sargassum vulgare* and *Cladophora sp.* and 9 species of benthonic macrofauna were recorded in the mid-littoral area of PINR: one cnidaria, five gastropods molluscs, two bivalve molluscs and one cirriped crustacean Tragsa 2009).

The infralittoral zone: two different bottom substrates can be identified, which make up three different benthic habitats within the PINR (Tragsa 2009):

- a) rocky bottom with sand patches, area: 83.85 ha.(21%);
- b) sandy bottom, area:310.19 ha.(78%);
- c) sandy bottom with *Cymodocea nodosa* seagrass, area: 1.13 ha (0.28%).

3.4.2. List of regionally important species (flora and fauna) (B-2a, Annex I)

List here ONLY those species protected by international agreements, particularly those marine species included in Annex II of the Protocol, which are present in the area. Any other species may be listed if it is clearly considered of regional importance given its high representation in the area. Display the species list under the headings Marine Plants, Terrestrial Plants, Marine Invertebrates, Fish, Amphibians and Reptiles, Birds, and Mammals. For each species state:

- a) its relative abundance as Common (C), Uncommon (U) or Occasional (O),
- b) Its global status as rare (r), endemic (e) and/or threatened (t), and
- c) its status as an important resident population (R), or important for its breeding (B), feeding (F), wintering (W) or migratory passage (M)

SPECIES	Rel. Abundance (C) (U) (O)	Global STATUS (r) (e) (t)	Local STATUS (R) (B) (F) (W) (M)
Examples: BIRDS			
<i>Pelecanus onocrotalus</i>	(C)	(e) (t)	(R)
<i>Falco eleonora</i>	(U)	(e) (t)	(B)
Marine plants			
Magnoliophyta			
<i>Zostera marina</i>			
<i>Zostera noltii</i>			
Phaeophyta			
<i>Cystoseira mediterranea</i>			
Terrestrial plants			
Marine invertebrates			
Mollusca			
<i>Charonia lampas</i> (= <i>Ch. Rubicanda</i> = <i>Ch. Nodifera</i>)			
<i>Dendropoma petraeum</i>			
<i>Lithophaga lithophaga</i>			
<i>Luria lurida</i> (= <i>Cypraea lurida</i>)			
<i>Mitra zonata</i> <i>Patella nigra</i>			
<i>Pholas dactylus</i>			
<i>Pinna nobilis</i>			
<i>Tonna galea</i>			
Fish			

Amphibians and Reptiles			
<i>Caretta caretta</i>	C	t	B
<i>Chelonia mydas</i>	U	t	W
<i>Dermochelys coriacea</i>	O	t	M?
Birds			
<i>Pandion haliaetus</i>	U	r	M
<i>Calonectris diomedea</i>	U	-	M, W
<i>Falco eleonora</i>	U	r	M, B?
<i>Hydrobates pelagicus</i>	O	r	M
<i>Larus audouinii</i>	U	t	M
<i>Phalacrocorax pygmeus</i>	U	r	M, W
<i>Pelecanus onocrotalus</i>	C	-	M
<i>Pelecanus crispus</i>	O	t	M
<i>Phoenicopterus ruber</i>	U	-	M
<i>Puffinus puffinus yelkouan</i> (<i>P. yelkouan</i>)	C	-	M, W
<i>Sternula albifrons</i>	U	-	M
<i>Sterna bengalensis</i>	-	-	Former breeder
<i>Sterna sandvicensis</i>	U	-	M, W
Mammals			
<i>Delphinus delphis</i>	-	t	
<i>Monachus monachus</i>	-	t	
<i>Stenella coeruleoalba</i>	-	-	

3.4.3. Flora: Describe in a few sentences the main plant assemblages significant in the area.

There are three main plant communities on the islands of the PINR (Tragsa 2009):

- * Plants associated with rocky areas such as spiny caper, glasswort, rock samphire, etc.
- * Plants associated with sandy areas such as sand lily, coast spurge, field pimpernel, trifold stock, etc.
- * Plants associated with wet soil or wetland areas such as toad rush, branched centaury, grass-poly, etc.

The PINR is only 0-12 m above sea level. According to Corine Classification (1999)17, the PINR belongs to the Thermo-Mediterranean Level category, which encompasses Mediterranean habitats up to 500 m in altitude.

3.4.4. Fauna: Describe in a few sentences, which are the main fauna populations present in the area.

The PINR is a habitat for only seven **mammal** species (Annex 5), five of which are flying mammals (bats: *Rhinolophus judaicus*, *Myotis blythi omari*, *Myotis capaccinii bureschi*, *Myotis nattereri hoveli*, *Pipistrellus kuhlii ikhawanius*). The two terrestrial species, the rabbit and the ship rat, are both introduced species. The rabbit was deliberately introduced by man and the rat probably arrived on boats, indeed may continue to be introduced from boats. The list of mammals in the PINR (Henriette Tohmé in Ramadan-Jaradi *et al.* 2004) summarizes the results of all surveys and inventories conducted on behalf of the Protected Areas Project. Additional species may occur but were not encountered in the various surveys. Further surveying and inventorying is likely to increase the number of officially recorded species. The mammal species of conservation importance are all the five bats. These are capable of regular passage to and from the mainland and are therefore not restricted to or dependent on the islands. It follows that the survival of all native mammal inhabitants and visitors to the Palm Islands is in large part dependent upon their conservation in habitat elsewhere.

Bird species inventory (Annex 6) summarizes the results of the survey and inventory work conducted by Ramadan-Jaradi, G. & Ramadan-Jaradi, M. (2001) as well as Ramadan-Jaradi, G. (2008) within the project on Common Consensus on the management of PINR financed by the Netherlands Embassy. Additional species may occur but were not encountered in the ornithological study. There are a total of 173 registered bird species in the NCSR inventory on the PINR. Thirteen of them are classified as globally threatened species as per IUCN Red List categories for 2007; two endangered (EN) (*Falco cherrug* and *Neophron percnopterus*), three vulnerable (VU), (*Pelecanus crispus*, *Falco naumanni* and *Aquila clanga*) and eight near threatened species (NT) (*Aythya nyroca*, *Falco vespertinus*, *Circus macrourus*, *Crex crex*, *Gallinago media*, *Limosa limosa*, *Glareola nordmanni* and *Larus audouinii*).

Sixty six of the bird species are mono-specific and only two are species restricted to the Middle East. This species representation indicates a high proportion of Mediterranean and European migratory species utilizing the PINR.

Of the total of 5 species (*Hemidactylus turcicus*, *Ptyodactylus puiseuxi*, *Lacerta laevis*, *Mabuya vittata*, and *Coluber jugularis asianus*) of terrestrial **reptiles** recorded on the islands (Ramadan-Jaradi *et al.* 2004) (see Annex 7), one subspecies, the wall lizard, is the only one endemic to the PINR. This species seems to be benefiting from human intrusion (Biodiversity Assessment and Monitoring in the Palm Island Nature Reserve. American University of Beirut, December 2007).

RAMADAN –JARADI ,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.

3.5. HUMAN POPULATION AND USE OF NATURAL RESOURCES

3.5.1 Human population

a) Inhabitants inside the area:

	Number	Date of data
Permanent	Null	9/3/2011
Seasonal number (additional to permanent)	Null	9/3/2011

b) Description of the population

The Law No. 121 dated 9/3/1992 establishing Palm Islands Nature Reserve, prohibits any one to stay in the reserve.

c) Main human settlements and their populations

N/A

3.5.2 Current human use and development

a) Briefly describe the current use of the area by subsistence, artisan, commercial and recreational fishing, hunting, tourism, agriculture and other economic sectors.

During July, August and September, people are allowed to visit the reserve without the need of a permit from the Protected Area Appointed Committee. The main aim of their visit is recreational (swimming in non polluted water, sun bathing, scuba diving, and hiking).

During the remaining days of the year, the visit to the reserve is limited to school and university students (educational), university students and teachers (research), scientists, naturalists, birdwatchers, environmentalists, etc (researchers, planners, tour operators and eco-tourists). Their visit is conditioned by their obtaining a visitor's permit.

Throughout the whole year round, visitors are under the supervision and guidance of the rangers/ guides.

Fishing is not allowed within the reserve and its legal water. Even though, some poaching may occur.

Hunting is strictly forbidden on the islands.

Few visitors use the organic white sand (fragments of shells) of the beach for the treatment of rheumatism by burying themselves in the sand.

Other visitors, chiefly women, don't hesitate to pick up secretly some culinary or medicinal plants.

b) Enter how many of the users depend on these resources, seasonality, and assessment of the social and economic importance of their use and of the perceived impact on the conservation of the area, in a score of 0-1-2-3 (meaning null, low, medium, high).

ACTIVITY AND CATEGORY	ASSESS IMPORTANCE OF								Estimated No. of Users	Seasonality
	Socio-economic				Conserv. Impact					
FISHING										
Subsistence	0	1	2	3	0	1	2	3	13	In winter
Commercial, local	0	1	2	3	0	1	2	3		
Commercial, non-local	0	1	2	3	0	1	2	3		
Controlled recreational	0	1	2	3	0	1	2	3	25	All seasons
Un-controlled recreational	0	1	2	3	0	1	2	3		
Other	0	1	2	3	0	1	2	3		
TOURISM										
Regulated	0	1	2	3	0	1	2	3	20.000/ year 200/ year	Mostly summer Mostly summer
Unregulated	0	1	2	3	0	1	2	3		
Indicate the type of tourism										
-Family visits	0	1	2	3	0	1	2	3	12.000/year	Mostly summer
-Guided tours	0	1	2	3	0	1	2	3	8.000/year	All seasons
.Birdwatching										
.Volunteers from NGOs										
Tourism facilities	0	1	2	3	0	1	2	3		
FOREST PRODUCTS										
Subsistence	0	1	2	3	0	1	2	3		
Non-timber commercial, local	0	1	2	3	0	1	2	3		
Non-timber commercial, non-local	0	1	2	3	0	1	2	3		
Timber commercial, local	0	1	2	3	0	1	2	3		
Timber commercial, non-local	0	1	2	3	0	1	2	3		
AGRICULTURE										
Agriculture	0	1	2	3	0	1	2	3		
Stockbreeding	0	1	2	3	0	1	2	3		
Aquaculture	0	1	2	3	0	1	2	3		
EXTENSIVE STOCK GRAZING										
Subsistence	0	1	2	3	0	1	2	3		
Commercial, local	0	1	2	3	0	1	2	3		
Commercial, non-local	0	1	2	3	0	1	2	3		
OTHER ACTIVITIES										
- Natural Treatment	0	1	2	3	0	1	2	3	300/year	Summer
-	0	1	2	3	0	1	2	3		

3.5.3. Traditional economic or subsistence uses

Name any environmentally sound traditional activities integrated with nature, which support the well being of the local population. E.g. land, water use, target species, if closed seasons or closed zones are used as management techniques.

Beside leisure boats, fishermen boats are ferrying visitors to and from the islands of the reserve and subsequently obtaining additional benefits.

The visitation is limited to development zone that is marked with infrastructure presence. Zone of breeding of marine Loggerhead Turtles *Caretta caretta* in summer and zones of breeding of Yellow-legged Gull *Larus michahellis* in spring are not accessed by visitors but observed from distance.

There are also 2 defined areas for research. These are representatives of the main habitats of the reserve (Figure 3) and used to reduce impact of researchers on non target species.

4. MEDITERRANEAN IMPORTANCE OF THE SITE

This Section aims at stressing the importance of the site for conservation at the regional or global scales, as set in Art. 8 para. 2 of the Protocol and B2-a, B2-b and B2-c in Annex I.

4.1. PRESENCE OF ECOSYSTEMS/HABITATS SPECIFIC TO THE MEDITERRANEAN REGION

Name the type of habitats considered of Mediterranean specificity, on the basis of the habitat classifications adopted within the framework of MAP, and their estimated cover (Ha).

The whole reserve is a stopover site for 156 migrating and wintering bird species which use it for fueling, resting, sheltering and roosting. Among these there are some globally threatened species that deserve conservation.

The islands' beach which is clean and safe is ideal for turtle nesting whilst such conditions are not provided on most of the continental beaches.

The islands have sandy beaches made out from shell fragments and used by local community for curing bodies from rheumatism through covering themselves by the sand for some hours

The islands have 83 plant species that once were widespread on the continental beach but nowadays extinct due to demographic pressure. The plants on the islands witness the past beach flora of Lebanon and hence considered a significant part of the natural heritage which attract the scientists, especially that half of these species are medicinal.

The rocky insular habitat is essential for the breeding of gulls. It constitutes the only place in Lebanon and east Mediterranean area where sea birds do breed.

Terrestrial (Ramadan-Jaradi *et al.* 2004):

- * **The rocky shoreline formation**
- * **The sandy beach formation**
- * **The earthen and stony formation**

Marine:

The **sandy Supralittoral habitat** with poor biocenosis of sands and with Facies of phanerogams which have been washed ashore (upper part). The species which inhabit the sandy supra-littoral (gastropods and crustaceans) usually have the habit of feeding on detritus, eating remains the sea throws up on the beach.

The **rocky supralittoral habitat** with a variety of algae and macrofauna: *Patella caerulea*, *Patella sp.*, and *Chthamalus montagui*.

The **sandy mediolittoral habitat** has more abundant fauna than the sandy supralittoral, made up, mainly, of mobile polychaete worms and crustaceans which live between the grains of sand.

The **rocky mediolittoral habitat** with 9 different species of algae like *Dictyota fasciola*, *Corallina elongate*, *Enteromorpha sp.*, *Cladostephus verticillatus*, *Sargassum vulgare* and *Cladophora sp.* and 9 species of benthonic macrofauna were recorded in the mid-littoral area of PINR: one cnidaria, five gastropods molluscs, two bivalve molluscs and one cirriped crustacean (Tragsa 2009).

The infralittoral zone: two different bottom substrates can be identified, which make up three different benthic habitats within the PINR (Tragsa 2009):

- a) rocky bottom with sand patches, area: 167.17 ha.;
- b) sandy bottom, area: 630.39 ha.;
- c) sandy bottom with *Cymodocea nodosa* seagrass, area: 2.23 ha.

4.2. PRESENCE OF HABITATS THAT ARE CRITICAL TO ENDANGERED, THREATENED OR ENDEMIC SPECIES

A critical habitat is an area essential to the conservation of the species concerned. These species should be those included in Annex II of the Protocol. E.g. Islets and sea stacks, as small islands in the sea or in large bodies of water, mostly important for water-bird colonies; caves appropriate for monk seals; undisturbed sand beaches where marine turtle nesting occurs; coastal lagoons where threatened fish or bird species feed or breed; tidal flats, coastal or benthic substrates important for marine invertebrates, etc.

Name the habitat types and the species linked to it.

- Islets: water-bird colony of Yellow-legged Gull but formerly of the globally threatened Audouin's Gull
- Undisturbed and clean sandy beaches (Figure 4) where Loggerhead do regularly breed
- Apparently appropriate good islands' surroundings to wintering Green Turtle
- During the period of preparation of the present annotated format, one local diver showed a film in a cave under Ramkine island with Monk seals. The head of the reserve's committee asked the oceanograph Prof. Dr. Ghazi Bitar to kindly verify and compare the cave in the film to those of the reserve. The latter (Bitar) mentioned that he also received a phone call from an area near Jounieh informing him of 2 Monk seals seen in mid-March 2011. The last time during which this endangered mammal species was seen near the PINR was in May 1997 by the managing team of the reserve.

4.3. OTHER RELEVANT FEATURES (Art. 8 paragraph 2 in the Protocol)

4.3.1. Educational Interest (B-3 in Annex I)

E.g. particular values for activities of environmental education or awareness

The Educational interest of the reserve comprises:

- Relatively high biodiversity of birds (40% of Lebanese birds observed in this small reserve.
- Activities of education on halophytes, and wind resistant plants of open area.
- Activities of awareness on disappearing Lebanese coastal plants that are currently conserved only on the Palm Islands Nature Reserve.
- Activities of education on how insular breeding birds occupy the space and interrelate and interact within ecosystems.
- Activities of education on sea currents and their capabilities of carrying pollutants beside biotic and abiotic matters
- Activities of education on the important gastropod which is a vermetid forming small but interesting reefs in rocky shore areas of Ramkine Island.

4.3.2. Scientific Interest (B-3 in Annex I)

Explain if the site represents a particular value for research in the field of natural or heritage sciences.

For ornithologists, the birds use the islands as a hot stopover- an opportunity to see about half of the Lebanese birds on a tiny area of the space.

For botanists, the plants which disappeared from the continental coastal area are still surviving on the islands. In addition to the threatened species which deserve study and protection there are two endemic plant species in the reserve.

For herpetologist, the easy access to the population of reptiles and their easy marking for monitoring purposes offer the scientists an opportunity that is not found elsewhere. Also the internationally threatened marine turtles visiting the islands for breeding or its waters for wintering offer better research conditions than in any other sites of the continental disturbed beaches.

For oceanologists, the study of marine diversity, biocenoses and habitats is made easier within the reserve where monitoring plots can be protected and maintained over the time.

4.3.3. Aesthetic Interest (B-3 in Annex I)

Name and briefly describe any outstanding natural features, landscapes or seascapes.

A number of aspects of the islands can be regarded as distinctive scenic landscapes including:

- The low elevation of Ramkine island together with the old lighthouse structure is said to resemble a ship sailing in the sea (Figure 5)
- The small rocky outcrop emerging from the sea behind the Ramkine island is considered to be a scenic feature of the islands.
- The snow-capped Mount Lebanon viewed from Palm Island's sandy beach is considered a nationally unique view.
- The gulls standing at sunset on the rocks of Sanani island appear like rows of teeth. (probably giving rise to the name of the island.).
- Rocky bottoms in the infralittoral zone are of great scenic beauty (Tragsa 2009)

4.3.4. Main cultural features

Indicate if the area has a high representative value with respect to the cultural heritage, due to the existence of environmentally sound traditional activities integrated with nature which support the well-being of local populations.

- The ruins of the Crusaders' church of the twelfth century on the Rabbit/ Palm Island (Figure 6)
- The Lighthouse ruins and associated two French Cannon-mounting sites of the early twentieth century on the Ramkine/ Fanar Island off shore Tripoli/Lebanon (Figure 7)
- Salinas ruins representing the traditional ways of extracting salt. (Figure 8)

5. IMPACTS AND ACTIVITIES AFFECTING THE AREA

5.1. IMPACTS AND ACTIVITIES WITHIN THE SITE

5.1.1. Exploitation of natural resources

Assess if the current rates of exploitation of natural resources within the area (sand, water and mineral exploitation, wood gathering, fishing, grazing...) are deemed unsustainable in quality or quantity, and try to quantify these threats, e.g. the percentage of the area under threat, or any known increase in extraction rates.

Exploitation of natural resources in PINR is limited to two types of occasional but damaging poaching:

- Illegal dynamiting for fish harvesting near the islands of the reserve during bad agitated sea periods or stormy weather so that the explosion sound can be mixed up with that of thunders whereas the weather condition makes the detection of poachers in the environ of the reserve difficult. This behavior has affected the peripheral rocks of the islands which became subjected to the cracks and drowning.
- Illegal collection of sea shells by divers of neighboring villages from the reserve's surrounding for commercial business. This type of taking destroys the food chain around the reserve and most probably within its boundary.

5.1.2. Threats to habitats and species

Mention any serious threats to marine or coastal habitats (e.g. modification, desiccation, disturbance, pollution) or to species (e.g. disturbance, poaching, introduced alien species...) within the area.

- Illegal dynamiting for fish harvesting near the islands of the reserve during bad agitated sea periods or stormy weather so that the explosion sound can be mixed up with that of thunders whereas the weather condition makes the detection of poachers in the environ of the reserve difficult. This behavior has affected the peripheral rocks of the islands which became subjected to the cracks and drowning.
- Illegal collection of sea shells by divers of neighboring villages from the reserve's surrounding for commercial business. This type of taking destroys the food chain around the reserve and most probably within its boundary.

- The large number of visitors during the summer recreational time may destroy the vegetation cover of the area above the supra-littoral zone, especially those plants which play a role in fixing the dunes. Some visitors have the tendency to leave their waste behind them on the islands and when they are told to take their waste with them to the harbor dump, they throw it in the sea when on their way back to harbor. Beside pollution, this large number of visitors causes, if not limited through carrying capacity studies, disturbance to the various ecological aspects of the islands.
- The PINR's plant formations show an exceptional repeated progressive dynamic. This is to a considerable degree due to the degradation caused by the introduced rabbits and the subsequent tendency of plant formations to recover and attain the climax stages.
- In the infra-littoral zone, the threat is mainly due to anchoring, high waste concentration on bottom and presence of invasive alien species (Tragsa 2009).

5.1.3. Demand by an increased population and infrastructures

Assess whether the current human presence or an expected increase in frequentation (tourism, passage of vehicles and boats) and any human immigration into the area, or plans to build infrastructures, are considered a threat.

The current visitors number may negatively impact the reserve if studies of carrying capacity are not conducted to regulate the number of people visiting the PINR. As stated above the anchoring of boats also constitutes a threat to the sea bottom near the islands shore. As for the plans to build infrastructures they are all submitted to interim assessment studies or EIA studies.

5.1.4. Historic and current conflicts

Make a brief statement of any historic or current conflicts between users or user groups.

There is no real or significant conflict detected between users.

5.2. IMPACTS AND ACTIVITIES AROUND THE SITE

In Art.7.2-e the Protocol calls for the regulation of activities compatible with the objectives for which a SPA was declared, such as those likely to harm or disturb species or ecosystems (Art.6.h), while Section B4 in Annex I asks to consider "the existence of threats likely to impair the ecological, biological, aesthetic or cultural value of the area" (B4-a in Annex I), recommending the existence, in the area and its surroundings, of opportunities for sustainable development (B4-d) and of an integrated coastal management plan (B4-e).

5.2.1. Pollution

Name any point and non-point sources of external pollution in nearby areas, including solid waste, and especially those affecting waters up-current.

The municipal rubbish dump of Tripoli that discharges its solid waste into the sea was a main source of pollution until it was completely closed in 2008 from the sea side upon requests from the Committee that is managing the reserve.

The current habit of boat owners in cleaning their vehicles in the sea, particularly near the islands constitutes another pollution threat. In addition to the waste generated from the recreational visitors in the summer. More than 15,000 barrels of oil have hit the coast of Lebanon after the bombing of storage tanks at the plant in the coastal village El-Jiye, 30km south of Beirut during the July 2006 war. The south westerly winds have taken the massive oil slick to beaches and ports a long way up to the islands of the reserve. However, the Government of Lebanon conducted during 2006-2007 cleaning up operations in PINR to mitigate the consequences of this oil spill crisis, many activities were carried out in this regards in cooperation with international organizations mainly: a rapid assessment of PINR to quantify the impact of war on the environment and management of the reserve, an assessment of the effect of the oil spill on the biophysical environment of the islands through conducting biodiversity terrestrial and marine surveys and pollution assessment, removal of oil contamination and implementation of a monitoring program for the marine part,

5.2.2. Other external threats, natural and/or anthropogenic

Briefly describe any other external threat to the ecological, biological, aesthetic or cultural values of the area (such as unregulated exploitation of natural resources, serious threats on habitats or species, increase of human presence, significant impacts on landscapes and cultural values, pollution problems, any sectorial development plans and proposed projects, etc.), likely to influence the area in question.

A potential threat originates from billionaires of the region who express their desire to build hotels and resorts on the tiny land of the reserve. Thanks to the status of the reserve as member of the international family (Ramsar, SPA, IBA site). This status assured the preservation from these buildings and maintained the reserve in its wild aspect.

5.2.3. Sustainable development measures

Comment whether the area is covered by an integrated coastal management plan, or bordering upon a zone under such a plan. Are there other opportunities for sustainable development provided for in the neighbouring areas?

The PINR is covered by a management plan that was developed for the period 2000-2005 and updated for the period 2008-2013 and complemented by guidelines for the management of Palm Islands in 2009 by Tragsa (2009) to guide the management of the reserve, and more specifically of the surrounding sea within a belt of 500 meters, and the marine resources within the designated boundaries of the protected area.

6. EXPECTED DEVELOPMENT AND TRENDS¹

The foreseeable development and trends of the site do not appear in the list of common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list, as established in the Protocol and its Annex I. Moreover, this is not always easy to assess and it is necessary to have knowledge about the site, which is not always available to all managers of protected areas; Thus, it is not obligatory to fill in the boxes in this Section 6.

On the other hand, the assessment of this foreseeable evolution and trends constitutes a dynamic supplement to the static knowledge of the site, as it appears in Sections 3, 4 and 5 above. Moreover, it is of significant importance for the definition of the objectives and the management plan of the site.

It thus appears desirable to bringing out the main outlines at least in respect to the following points:

6.1. EXPECTED DEVELOPMENT AND TRENDS OF THREATS TO AND PRESSURES UPON THE AREA

Deal briefly in succession with:

- The demographic development in and around the site
- The development of economic activities (other than tourism and recreation) within the area
- The development of local demand on tourism and recreation
- The development of tourism pressure on the area

The number of visitors increases in correlation with the demographic development (Diary books of the management team). Subsequent to this, the quantity of waste left behind the visitors, the sea bottom area that is damaged by anchors and the impact of stepping on the *Euphorbia* that plays a role in fixing the sand of the upper beach increase and threaten the ecological function of the islands ecosystems.

The tour operators started already exercising some pressure, through politicians, on the management team to obtain more permits for visits even when the reserve is busy with delicate research or with training activities. A visitor management plan should be developed to remedy this situation.

6.2. POTENTIAL CONFLICTS IN THE AREA

Make a brief statement of potential use conflicts between the users or group of users of the site.

There is no real or significant conflict detected between users

¹ By expected development and trends are meant the development, which is thought most likely to occur in the absence of any deliberate intervention to protect and manage the site.

6.3. EXPECTED DEVELOPMENT AND TRENDS OF THE NATURAL LAND ENVIRONMENT AND LANDSCAPES OF THE AREA: as expected arising from the evolution of the pressures

The proper implementation of the management plan that was developed in collaboration with the local communities prevents any development and trends of the natural environment and landscapes of the area.

6.4. EXPECTED DEVELOPMENT AND TRENDS OF THE MARINE ENVIRONMENT AND SEASCAPES OF THE AREA: as expected arising from the evolution of the pressures

The proper implementation of the management plan that was developed in collaboration with the local communities prevents any development and trends of the marine environment and seascapes of the area.

7. PROTECTION REGIME

7.1. LEGAL STATUS (General Principles "e" and Section C-2 both in Annex I)

7.1.1. Historical background of the protection of the site

Following studies of wildlife on Palm Islands by G. Tohmé and his team in early seventies, it appeared that the islands of Rabbit (Palm), Ramkine and Sanani are of high significance for the conservation of a wide variety of species nowadays called « biodiversity ». Parts of the results of the studies were published (Tohmé & Neushwander, 1974) or documented in reports at the CNRS (National Council for Scientific Research). During the meeting of Beirut in early seventies about the protection of the Mediterranean against pollution, Tohme expressed the need to declare the three islands a reserve. Later he continued lobbying for their conservation with new supporters, the Environment Protection Committee and the Friends of Horsh Ehden NGOs. The fruits of these efforts where on March 9th 1992, when the parliament issued the law #121 declaring the Palm, Sanani and Ramkine islands a nature reserve, and forming a committee of volunteers appointed by the Ministry of Environment to manage the reserve and to encourage studies and scientific research, which was known later as the Government Appointed Committee (GAC) and currently as Appointed Protected Area Committee (APAC).

7.1.2. Legal texts currently ruling the protection on the site

Enter the national conservation category, the dates and the present enforcement status of the legal instrument declaring the protection of the area. Consider both the land and the marine areas of the site. Include the full text(s) as an annex.

Law No. 121 dated March 9, 1992 is the legal instrument declaring Palm islands (Palm, Sanani and Ramkine) a nature reserve and ruling the protection of the site. (the text of the law is enclosed in annex 1).

The Palm Islands is nationally classified under Nature Reserve national category. However, with grant funding from the EU, MOE implemented in 2004-06 the "Stable Institutional Structure for Protected Areas Management" (SISPAM) project to capitalize on the vast cumulative experience in PA management and make recommendations for enhancing the PA system in Lebanon. Under SISPAM, the Ministry, with technical assistance from ECODIT, prepared a "National Action Plan for Protected Areas" and developed a new PA category system that is inspired by the IUCN classification system for protected areas and would comprise four categories, for each category, criteria for the establishment of the PA were defined as well as its management objective:

1. National Park (IUCN Category II)
2. Natural Monument (IUCN Category III)
3. Habitat/Species Management Area (IUCN Category IV)
4. Protected Landscapes/Seascapes (IUCN Category V)

The Ministry of Environment has prepared a draft decree to endorse the proposed category system, but it still awaits formal approval by the Council of Ministers. So currently all existing protected areas are under "Nature Reserve" category, but once the draft decree on PAs categories is endorsed, the current protected areas would need to be reclassified according to one of the four categories listed above.

7.1.3. Objectives (General Principles "a" and D-1 in Annex I)

Name in order of importance the objectives of the area as stated in its legal declaration.

The following main objectives are stated in the legal declaration of the PINR:

- Protection and conservation of biodiversity
- Promotion of scientific research
- Rehabilitation of the ecological status of the islands

7.1.4. Indicate whether the national protection regime arises from international treaties enforced or from implementation measures of treaties (Art. 6.a in the Protocol).

The national protection regime arises from international treaties enforced.
The national protection of TCNR is influenced by several international conventions and agreements that have either been signed or ratified by the Lebanese government. These conventions include:

- The Convention on Biological Diversity (CBD) that was signed in 1992 and ratified in 1994 (Law No. 360/94).
- The African Eurasian Water Bird Agreement (AEWA) that was ratified in June 2002 (Law No. 412).
- The Barcelona Convention that was signed in 1976 and ratified in 1977 (legislative decree No.126), and its protocols, and the revised Action Plan for the conservation of marine turtles (1999).
- The United Nation Convention on the Law of the Sea that was signed and ratified in 1995.
- Ramsar Convention on Wetlands that was ratified in 1/3/1999 (Law No. 23)

7.2. INTERNATIONAL STATUS

7.2.1. Transboundary or high seas areas

Complete this section only if the area is transboundary, totally or partially in the high sea, or within areas where the limits of national sovereignty or jurisdiction have not yet been defined. In this case, mention the modalities of the consultation (Art. 9 para. 3A in the Protocol and General Principles “d” in Annex I).

N/A

7.2.2. International category

Mention if the area, or part of it, has been designated and on what date, with an international conservation category (e.g. Specially Protected Area, Biosphere Reserve, Ramsar Site, World Heritage Site, European Diploma, Natura 2000, Emerald network, etc.).

Specially Protected Area on 1995
Wetland of international importance or Ramsar Site under the Ramsar Convention in 2001 (OK, the year 2001 is right)
Important Bird Area in 1994 (Birdlife 1994)
Wetland of international importance as identified by Carp (1980)

7.3. PREVIOUS LEGAL BACKGROUND AND LAND TENURE ISSUES

Briefly mention if the area or part of it is subject to any legal claim, or to any file open in that connection within the framework of an international body. Describe the land tenure regimes within the area, and append a map if existing.

The area of Palm Islands or part of it is not subject to any legal claim, or to any file open in that connection within the framework of an international body.
The PINR is a state property (owned by Ministry of Finance); its fishery sector is under the regulations issued by the Ministry of Agriculture. Being in possession of a light house, the islands are under the responsibility of the Ministry of Public Works and Transport. The law declaring Palm islands a nature reserve makes the latter managed and supervised by the Ministry of Environment and under its tutelage. No conflict is seen between the main users of the islands.

7.4. LEGAL PROVISIONS FOR MANAGEMENT (Section D-1 in Annex I)

7.4.1. Zoning

Briefly state if the legal text protecting the area provides for different zones to allocate different management objectives of the area (e.g. core and scientific zones in both land and sea, fishing zones, visitation, gathering, restoration zones etc) and in this case the surface area in ha of these zones. Include a map as an annex

The Law establishing the reserve doesn't identify any zoning to allocate different management objectives of the area but the APAC considered the breeding area of gulls and the nesting area of marine turtles as strictly protected areas (core conservation zone). Similarly, the APAC noticed that some researchers may damage non target species whilst on islands. For this reason, the APAC limited the terrestrial research on the reserve to two areas representatives of the main biotopes of the landscape: sandy-earthen research zone and rocky research zone. Recently, the APAC is in the process of imposing submerged marine zones based on the marine studies that were achieved by Tragsa in 2009.

7.4.2. Basic regulations

Mention the provisions, which apply to the area concerning the implementation of Article 6 of the Protocol (paragraphs a to i), Section D5 (a to d) in the Annex I and Article 17 of the Protocol.

There are a number of relevant laws and initiatives that apply to the area concerning the implementation of Article 6 of the Protocol (paragraphs a to i) and the section D5 (a-d) in the Annex1.

- Law no. 444/02 (Code of Environment) specifies, under Chapter VIII, the protection, conservation and management of nature and biodiversity,
- Law no. 121/92 declares the site as a nature reserve in 1992 (find attached in Annex 1),

- Law no. 508/04 (Hunting Law) is the latest attempt for controlling hunting in terms of season, amount and type of game birds along with a permit system based on hunting testing,
- Decision no 125/1 dated 23/9/1999 states the protection of marine turtles, monk seals and whales.

For the area concerning the implementation of Article 17, an Interim Report or an Initial Environmental Examination or EIA (according to the size of the project) is a pre-requisite to any potential project in the reserve.

7.4.3. Legal competencies

Section D4 in Annex I states that the competence and responsibility with regard to administration and implementation of conservation measures for areas proposed for inclusion in the SPAMI List must be clearly defined in the texts governing each area. Additionally Art.7.4. of the Protocol calls for the provision of clear competencies and co-ordination between national land and sea authorities, with a view to ensuring the appropriate administration and management of the protected area as a whole. Mention in which way do the legal provisions clearly establish the institutional competencies and responsibilities for the administration and conservation of the area, and if being the case, their co-ordination means, including those between land and sea authorities.

- The Law No.690 dated 26/8/2005 organising the Ministry of Environment and defining its mandate, states that MOE is responsible of the establishment, protection and management of protected areas.
- The Law No. 121 dated March 9, 1992 establishing Palm islands nature reserve, states that a committee established through a decision from the Minister of Environment and including 7 people representing the local authorities (municipalities) and environmentalists is responsible for carrying out protection and prevention activities and mobilizing studies and scientific resources for the ecological rehabilitation of the reserve. This committee (APAC) works under the overall supervision and support from the Ministry of Environment (MoE).
- The law No.214 dated 2/4/1993 and its amendments (lawNo.247 dated 7/8/2000) states that the Ministry of of Public Works and Transport (MoPWT) is mandated to control the implementation of the legislation and rules related to transport and to the marine public properties., However (due to the mandate of MoE over PINR) the relation of MoPWT with the reserve became limited to running the lighthouse present on Ramkine island. In this regards, the management team asked the MoPWT to use a clean energy for the lighthouse instead of the traditional use of fuel. Subsequent to this, the MoPWT cooperated immediately and provided the lighthouse with solar energy panels.

- The decree No. 22 dated 22/1/1981 (Organization of the Army) states that the Marine Forces in the Army are responsible of the coast defense. Therefore the Ministry of Defense / Lebanese Army is in charge of patrolling the sea and keeping its activities in order. The APAC requests the army to assist them against poachers on the reserve in order to control the violations on site.
- The legislative decree No.31 dated 18/1/1955, defining the mandate of the Ministry of Agriculture (MOA), states that the Ministry of Agriculture is responsible for implementing the legislation related to fisheries and fishing activities. At a time during which the protection of marine turtles wasn't incorporated in any legislation, the management team lobbied for the conservation of these threatened reptiles which usually nest on the beaches of the PINR until the Ministry of Agriculture issued a Decision protecting them.
- The examples above show that the competencies and responsibilities of the various actors are concerted to serve the Law. These are supported by a management plan developed by the APAC and endorsed by MoE, a management team (hired by APAC in coordination and approval of MoE) and a monitoring programme (Section D6,7 and 8 of Annex 1 of the Protocol).

7.4.4. Other legal provisions

Describe any other relevant legal provisions, such as those requiring a management plan, the establishment of a local participation body, binding measures for other institutions or economic sectors present in the area, allocation of financial resources and tools, or any other significant measures concerning the protection and management of the area or its surrounding zones.

The APAC appointed through a Decision of the Minister of Environment is the local body responsible for management and protection of the reserve under the overall supervision of the Ministry of Environment. The APAC hires a management team (in coordination with the Ministry of Environment and upon its approval) who is responsible of implementation of daily management activities in the site. In case of PINR, the management team includes only at present rangers but the process of recruitment of a manager for the reserve was initiated recently by MoE and the APAC.

MoE allocates regular financial contribution to the APAC to support the management of the reserve.

Management Plans were developed for PINR and endorsed by MoE: a Management Plan for the period 2000-2005 and updated for the period 2008-2013 and complemented by guidelines for the management of the marine part of Palm Islands in 2009 by Tragsa.

The Ministry of Environment prepared a draft Law on nature reserve in Lebanon, which is pending endorsement. Once issued, this law will resolve any management, administrative and financial obstacles facing nature reserves since this law (1) defines the management objectives for nature reserves, (2) regulates the establishment of nature reserves on private lots, (3) details the management structure of the nature reserves (APACs and management team) and formally recognizes the legal identity of APAC, (4) addresses the financing mechanisms of the nature reserves, (5) grants APAC the right to collect entrance fees and to impose fines upon violations, (6) uses zoning to encourage sustainable use inside the nature

Within the framework of the Stable Institutional Structure for Protected Areas Management (SISPAM) Project, MOE prepared a National Action Plan for Protected Areas (NAPPA) which outlines purposes, objectives, and tasks that need to be fulfilled in order to successfully manage protected areas in Lebanon.

The National Action Plan for Protected Areas (NAPPA), a visionary document that has determined the priority activities and actions for effective management of Protected Areas in Lebanon. It allocates roles and responsibilities and budget estimates for the implementation of the priority activities and actions. Based on the NAPPA, the MoE developed a draft law program to secure the necessary budget from the public treasury for the implementation of the activities foreseen in the NAPPA. Once the law program will be endorsed, necessary funds will be allocated to finance the activities and actions outlined in the NAPPA.

Moreover, within the SISPAM project, the following tools addressing the management of nature reserves and their financing were produced:

- A national financial sustainable strategy for PAs that suggests alternative mechanisms for financing PA management
- A database for available sources of funding for PAs among international sources which includes a list of potential donors, conditions and procedures for applications
- A National Capacity Building Strategy for key players in PA management structure (MoE, APACs and management teams)
- A Management tool kit for Protected Areas including: (1) Monitoring and evaluation indicators for PA management, (2) Job description for PAs management team, (3) Policies and procedures for improved management

Based on the job description, the MoE has prepared a draft decree (which is still pending endorsement) that states the TORs & job description for PAs staff, defining their roles, prerogatives and their capacity building needs.

8. MANAGEMENT

Through the General Principles, para. (e) in the Annex I, the Parties agree that the sites included in the SPAMI List are intended to have a value as examples and models for the protection of the natural heritage of the region. To this end, the Parties ensure that sites included in the List are provided with adequate legal status, protection measures and management methods and means.

8.1. INSTITUTIONAL LEVEL

8.1.1. Authority/Authorities responsible for the area

- Ministry of Environment is the tutelage authority over the nature reserve and is responsible for its supervision, protection and management. The MoE appoints a committee (APAC) including representatives from local environmentalists, municipalities, NGOs and universities for the local management of the reserve.
- Army for assisting in patrolling and preventing actions that cause damage to the reserve.
- Ministry of Public Works and Transport for running the lighthouse.
- Ministry of Agriculture for controlling the fishery sector and protection of marine mammals and reptiles.

8.1.2. Other participants in the management body

Such as other national or local institutions, as stated in Section D6 in Annex I.

The managing committee (APAC) is formed from representatives of:
Municipality of Tripoli
Municipality of Mina
Lebanese University - Ornithology
Balamand University - Oceanology
Environment Protection Committee (NGO)
Union of NGOs of the North Lebanon
Fishing Order

8.1.3. Participants in other committees or bodies

Such as a scientific committee, or a body of representatives from the local stakeholders, the public, the professional and non-governmental sectors, as in Sections B4-b and B4-c in Annex I.

The managing committee implement the activities of the management plan in coordination and partnership with stakeholders from the public and private sectors: civil bodies, trade unions, educational, academic, media, and international organizations.

8.1.4. Effectiveness

As stated in Section B4 of Annex I, assess as very low, low, moderate, satisfactory, very satisfactory, and comment as needed on the following aspects:

a) Effectiveness of the co-ordination, where existing: Satisfactory. Coordination is a preventive remedy to arising conflicts if characterized by transparency.

b) Quality of involvement by the public, local communities, economic sectors, scientific community: Satisfactory.

The involvement of the public is essential to solve many problems in the reserve. The public, particularly the local community, has a tendency to protect the area and is part of its planning and management.

Despite the fact that tour operators offer the needed information to develop eco-tourism strategies, the economic sector, in general, is not satisfactorily involved in the management of the reserve. Care should be taken to keep conservation and ecotourism well balanced.

The scientific community is best satisfied in reserves where the ranger constitutes a good source of information for them, a good guard for their monitoring plots, and a perfect correspondent providing data for remote studies. Example: the rangers inform the scientists through phone calls or email about the frequency of appearance of marked lizards, the first date of blooming of a plant species, the first date and number for the nests made by a marine turtle, etc...

8.2. MANAGEMENT PLAN (as set out in D7 of Annex I)

8.2.1. Management Plan

State if there is a management plan (MP) and in this case include the document as an annex. In the absence of a MP, mention if the main provisions governing the area and the main regulations for its protection are already in place and how (D7 in Annex I) and if the area will have a detailed management plan within three years (D7 in Annex I).

The PINR has a Management Plan for the period 2000-2005 (Annex 2), followed by an updated one by the APAC for the period 2008-2013 and complemented by guidelines for the management of the submerged (marine) parts of the reserve by Tragsa (2009) (Annex 3), especially that the first management plan was almost dedicated to the terrestrial areas of the reserve.

8.2.2. Formulation and approval of the Management Plan

Mention how the MP was formulated, e.g. by an expert team and/or under consultation and/or participation with other institutions or stakeholders. State the legal status of the MP, whether it is officialized, and how, and if it is binding for other institutions and sectors involved in the area.

The first MP was prepared by MoE through the consultation of experts from IUCN. The updated one was the result of efforts made by the APAC, particularly its President.

The Guidelines for the management of the reserve, chiefly its marine area were prepared by Tragsa and financed by the Spanish Development Agency in 2009.

All these management plans were prepared in collaboration with local communities and various stakeholders and under the supervision of MoE..

The MP of the PINR is endorsed by the Minister of Environment and proved binding of other institutions and sectors involved in the area.

8.2.3. Contents and application of the Management Plan

State the degree of detail in the MP by entering YES or NO in the following list of potential contents, and assess the degree of implementation of the MP by using the 0-1-2-3 score on the right hand side:

	Existing in MP		Degree of application			
	YES	NO	0	1	2	3
Detailed management objectives	<u>YES</u>	NO	0	1	2	<u>3</u>
Zoning	<u>YES</u>	NO	0	<u>1</u>	2	3
Regulations for each zone	<u>YES</u>	NO	0	<u>1</u>	2	3
Governing body(ies)	<u>YES</u>	NO	0	1	<u>2</u>	3
Management programmes as:						
Administration	<u>YES</u>	NO	0	1	<u>2</u>	3
Protection	<u>YES</u>	NO	0	1	2	<u>3</u>
Natural resource management	<u>YES</u>	NO	0	1	2	<u>3</u>
Tourism and Visitation	<u>YES</u>	NO	0	<u>1</u>	2	3
Education and Training	<u>YES</u>	NO	0	1	<u>2</u>	3
Research and Monitoring	<u>YES</u>	NO	0	1	2	<u>3</u>
Services and Concessions	<u>YES</u>	NO	0	1	<u>2</u>	3
Fund raising activities	<u>YES</u>	NO	0	<u>1</u>	2	3
Periodic revisions of the MP	<u>YES</u>	NO	0	1	<u>2</u>	3

8.3. PROTECTION MEASURES

By Art. 6 of the Protocol the Parties agree to take all the necessary protection measures required for the conservation of the area, particularly the strengthening the application of the other Protocols to the Convention, and through the regulation of any other activity likely to harm the natural or cultural value of the area, such as economic, recreation or research activities. As per Section D2 in Annex I, the protection measures must be adequate to the site objectives in the short and long term, and take in particular into account the threats upon it.

8.3.1. Boundaries and signing

Briefly, state if the boundaries of the area and its zones are adequately marked in the field, both on land, in the sea, and at the principal points of access.

The terrestrial boundary of the reserve is naturally marked
The marine belt of 500 meters surrounding the islands and making an integral part of the reserve is currently not marked. Previously it was marked by sea-floats but anti-reserve fishermen of the past cut the ropes tying them to the sea bottom, a matter which enabled sea currents taking them away.
The research zones are marked only by panels and the main access point is marked by the presence of a doc.

8.3.2. Institutional Collaboration

Name the different national and local institutions or organisations with legal responsibilities or involved in the protection and surveillance of land and sea zones, and any measures or mechanisms through which their co-ordination is pursued.

Ministry of Defense-Army: responsible for surveillance and arrest of poachers upon calls from Management Team.
NGO-EPC is represented in the managing committee but also welcomed when fundraising for the reserve.
Municipalities of Mina and Tripoli are represented in the managing committee but also requested by the Law to fund projects and maintenance activities on the islands (Article 10).
The Ministry of Environment is the tutelage authority of the nature reserve and is responsible for funding, and beside the APAC for its protection, management, surveillance, employees recruitment, monitoring, maintenance & fundraising.

8.3.3. Surveillance

Consider the adequacy of the existing protection means (human and material), and your present ability to survey land and sea uses and accesses

Rangers and patrols are the essential protection means to protect and survey and control visitors and poachers provided the financial situation of the reserve is appropriate. The fear is from potential political tension which may reduce the financial ability of the APAC and subsequently its activities.

8.3.4. Enforcement

Briefly, consider the adequacy of existing penalties and powers for effective enforcement of regulations, whether the existing sanctions can be considered sufficient to dissuade infractions, and if the field staff is empowered to impose sanctions.

The existing penalties (Articles 6, 7, 8 and 9 of the Law 121/92) provide the power needed to effectively conserve and protect the PINR and are sufficient to dissuade infractions.
Recently, the reserve's rangers were empowered to issue fine's ticket to a poacher or any one breaching the Law provided they (rangers) sworn first in front of the governor.

9. AVAILABLE RESOURCES

9.1. HUMAN RESOURCES (Art. 7.2.f in the Protocol)

9.1.1. Available staff

Assess the adequacy of the human resources available to the management body, in number of employees and training level, both in central headquarters and in the field. Indicate if there are staff training programmes.

The current management team available is composed of two rangers/ guides and one secretary. During visitation season (July-September) three rangers/ workers join the original staff on daily basis salary. It is believed that the staff size is not sufficient to manage the reserve and visitors at day time and to monitor poachers and turtles at night time. Recently, MoE and the APAC have initiated the administrative process to hire a reserve's manager.

The rangers of the permanent staff frequently attend training workshops within and outside the country on various management and monitoring aspects. Within Lebanon, the Ministry of Environment involves the staffs of all protected areas to its training program.

9.1.2. Permanent field staff

Answer YES or NO on the current existence of the following FIELD staff categories. If YES, enter the number of staff either permanent or part-time in that category, and evaluate on a 0-1-2-3 score (0 is low, 3 is high) the adequacy of their training level.

	YES/NO		NUMBER Permanent/Part-time	ADEQUACY OF TRAINING LEVEL			
	YES	NO		0	1	2	3
Field Administrator	YES	NO		0	1	2	3
Field Experts (scientific monitoring)	<u>YES</u>	NO		0	<u>1</u>	2	3
Field Technicians (maintenance, etc)	YES	<u>NO</u>		0	1	2	3
Wardens	<u>YES</u>	NO		0	1	<u>2</u>	3
Of which marine wardens	YES	<u>NO</u>		0	1	2	3
Guides/ <u>rangers</u>	<u>YES</u>	NO		0	1	<u>2</u>	3
Other	YES	NO		0	1	2	3

9.1.3. Additional Support

Briefly, describe if the area currently has the advantage of other external human resources in support of its objectives, either from other national or local institutions, volunteer programmes, non-governmental organisations, academic or international organisations. Mention if there are any significant changes in prospect for the near future.

The PINR is largely dependent on volunteers, scouts, NGOs for the management of the reserve and the visitors.

Frequent and regular cleaning campaigns of the reserve are undertaken by volunteers environmental scouts. The NGOs and municipalities participate in providing human resources for cleaning operations but NGO implement also training, management, assessment and monitoring projects for the benefit of the reserve. Tour operators and the hickers they bring to the islands also participate in the cleaning operations.

9.2. FINANCIAL RESOURCES AND EQUIPMENT

By Art. 7 in the Protocol, the Parties agree to adopt measures or mechanisms to ensure the financing of the specially protected areas (Art.7.2.d), and the development of an appropriate infrastructure (Art.7.2.f). The General Principles para. "e" in the Annex I call upon the Parties to provide the areas with adequate management means.

9.2.1. Present financial means

Note if the basic financing is ensured: a core funding for basic staff, protection and information measures. Who provides this core funding? Briefly assess the degree of adequacy of the present financial means for the area, either low, moderate, satisfactory; e.g. the implementation of the management plan, including protection, information, education, training and research.

PINR management is expensive and studies from around the world show those revenues from visitors and other forms of ecotourism alone cannot sustain management costs of PAs. PINR management is therefore a national responsibility requiring yearly allocation from the national treasury. MoE has been disbursing funds to support the management of the PINR through Appointed Protected area Committees (APAC) but a review of total disbursements from 2001 through 2008 shows that the allocations are a core funding for basic staff and infrastructure maintenance. As for the implementation of the management plan, the allocation is moderate.

9.2.2. Expected or additional financial sources

Briefly describe any alternative sources of funding in use or planned, and the perspectives for long-term funding from national or other sources.

The committee of PINR is actively writing project proposals that are submitted to local and foreign donors. In the near past, the PINR benefited from projects that were funded by Embassies and development Agencies to strengthen the management of the reserve. (Note on past financial sources of funding: PINR benefitted in the past from international funded projects mobilized and executed by MoE for protected areas, these projects supported PINR in developing management plans, assessment and monitoring of biodiversity, development of awareness and education materials, training and capacity building programs, infrastructure etc...)

9.2.3. Basic infrastructure and equipment

Answer YES or NO to the following questions, and if YES, assess with a score of 1-2-3 (1 is low, 3 is high) the adequacy of the basic infrastructure and equipment.

	YES/NO		ADEQUACY			
Office and/or laboratory in the field	YES	<u>NO</u>	0	1	2	3
Signs on the main accesses	<u>YES</u>	NO	0	1	<u>2</u>	3
Guard posts on the main accesses	YES	<u>NO</u>	0	1	2	3
Visitors information centre	YES	<u>NO</u>	0	1	2	3
Self guided trails with signs	<u>YES</u>	NO	0	1	<u>2</u>	3
Terrestrial vehicles	YES	<u>NO</u>	0	1	2	3
Marine vehicles	<u>YES</u>	NO	0	1	<u>2</u>	3
Radio and communications	<u>YES</u>	NO	0	1	<u>2</u>	3
Environmental awareness materials	<u>YES</u>	NO	0	1	<u>2</u>	3
Capacity to respond to emergencies	<u>YES</u>	NO	0	1	<u>2</u>	3
<p>Comment on basic infrastructure and equipment Due to the harsh sea weather, there is a need to regularly maintain and improve the basic infrastructure on the PINR such as benches, sunbrellas, trails, docks, irrigation system, etc.</p>						

9.3. INFORMATION AND KNOWLEDGE

By Section D3 of Annex I, the Parties agree that the planning, protection and management of a SPAMI must be based on an adequate knowledge of the elements of the natural environment and of socio-economic and cultural factors that characterize each area. In case of shortcomings in basic knowledge, an area proposed for inclusion in the SPAMI List must have a programme for the collection on the unavailable data and information.

9.3.1. State of knowledge

a) Assess the general state of knowledge of the area.

0	1	2	<u>3</u>
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b) Briefly describe the extent of knowledge of the area, considering at least specific maps, main ecological processes, habitat distribution, inventories of species and socio-economic factors, such as artisan fishing.

The CNRS, Lebanese University, Balamand University, Islamic University, Individual researchers, graduate and post-graduate students, NGOs, and foreign scientists regularly visited the PINR since 1996 and conducted studies on botany, ornithology, pedology, climatology, geology, geomorphology, mammalogy, herpetology, geography, ichthyology, oceanography, hydrology, hydrobiology, entomology, ecology, etc. These studies constituted the benchmark for monitoring and evaluating the biodiversity of the PINR and for adapting the management of the reserve. Unfortunately, the Rabbit (Palm) island got the lion's share of studies. This is probably due to its larger size and its various habitats ranging from sandy and rocky shores to earthen middle and shallow surroundings. However, the most important studies that were conducted on the reserve are those of Ramadan-Jaradi *et al.* 2004 which resulted in biodiversity database with annotated checklists of mammals, birds, reptiles, and insects. The main socio-economic factors are those related to ecotourism and local visitors. The artisanal fishing is prohibited within the boundary of the reserve.

9.3.2. Data collection

Describe and assess the adequacy of any programme and activities to collect data in the area.

Data collection was done with professionalism due to the help of experts or the presence of well trained assistants.

9.3.3. Monitoring programme

Section D8 in Annex I states that to be included in the SPAMI List, an area will have to be endowed with a monitoring programme having a certain number of significant parameters, in order to allow the assessment of the state and trends of the area, as well as the effectiveness and protection and management measures, so that they may be adapted if need be (indicators may, for instance, supply information about species status, condition of the ecosystem, land-use changes, extraction of natural resources -sand, water, game, fish-, visiting, adherence to the provisions of the management plan, etc.).

a) Is there a monitoring programme?

<u>YES</u>	NO
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b) If NO, are there plans to start one, and when?

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c) If YES, assess as low, medium, satisfactory, its adequacy and present level of development.

Medium level of adequacy probably due to being at early stages of implementation.

d) If YES, who is/are carrying out the monitoring programme?

Professional ornithologist and herpetologist for bird and reptile monitoring; the American University of Beirut assisted by expertise from IUCN for the marine studies.

e) If YES, briefly describe how the monitoring programme will be used in reviewing the management plan.

The APAC will be responsible, on behalf of the Ministry of Environment, for regular review of the implementation of the management plan.

The APAC will be required to report to the Ministry of Environment, advising the results of their assessment of progress and making any recommendations that it sees as necessary to improve the progress in implementation.

The APAC, in collaboration with the Ministry of Environment will be expected to:

- Periodically meet with the local Management Team (or other committee or agency lawfully responsible for the area) to establish progress and problems being encountered in implementation of the plan.
- Periodically, in the company of the Management Team (or other committee or agency lawfully responsible for the area), inspect the reserve to observe the condition of the reserve and compliance with the management plan.
- Prepare annual reports to the Ministry of Environment, incorporating the report presented during the relevant year from the local Management Team and any other information relevant to the implementation of the plan.
- Make recommendations to the Ministry of Environment on any changes necessary to improve the compliance with and implementation of the plan.

10. Other information, if any

11. CONTACT ADDRESSES (name(s), position(s) and contact address(es) of the person(s) in charge with the proposal and that compiled the report)

Person In charge of the proposal:

Mrs. Lara Samaha
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12. SIGNATURE(S) ON BEHALF OF THE STATE(S) PARTY/PARTIES MAKING THE PROPOSAL

Mohammad Rahal
Minister of Environment

The image shows a handwritten signature in blue ink over a circular official seal. The seal is green and contains the text "Ministry of Environment" and "Republic of Lebanon" around a central emblem of a cedar tree. The signature is written in a cursive style.

13. DATE

11/5/2011