REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT

Lebanon's Marine Protected Area Strategy

الاستراتيجية اللبنانية الخاصة بالمحميات البحرية

Supporting the management of important marine habitats and species in Lebanon

IUCN

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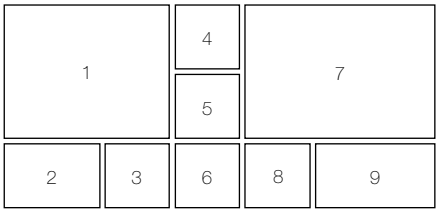

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2- Byblos Old Port, proposed MPA.

3- PINR: Ramkin seen from Palm. © Ghassan Garadi.

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Ministry of Environment
Lazarieh bldg. 8th flr.
P.O. Box 11- 2727
Beirut, Lebanon
Tel +9611976555
Fax +9611976530
www.moe.gov.lb

Or

IUCN Centre for Mediterranean Cooperation
C/ Marie Curie 22
29590 Campanillas, Malaga, Spain
Tel: +34 952 028430
Fax: +34 952 028145
www.iucn.org/mediterranean

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Supporting the management of important marine habitats and species in Lebanon

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Authors:

Hany El Shaer, Ph.D, Project coordinator, IUCN Centre for Mediterranean Cooperation / Global Marine Programme
helshaer@hotmail.com

Ms. Lara Samaha, Head of Department Ecosystems, Service of Nature Resources, Ministry of Environment
l.samaha@moe.gov.lb

Ghassan Jaradi , Ph.D, Professor of Ecology and Zoology, Faculty of Sciences, Lebanese University
rjaradi@cyberia.net.lb

Project team:

Mr. Alain Jeudy de Grissac,
Marine Programme Conservation Manager, IUCN Centre for Mediterranean Cooperation, Malaga (Spain)
alain.jeudy@iucn.org

Hany El Shaer, Ph.D, Project coordinator, IUCN Centre for Mediterranean Cooperation / Global Marine Programme
helshaer@hotmail.com

Ms. Lara Samaha, Head Department Ecosystems, Service of Nature Resources, Ministry of Environment
l.samaha@moe.gov.lb

Ms. Rasha Kanj, Project focal point, Department Ecosystems, Service of Nature Resources, Ministry of Environment
r.kanj@moe.gov.lb

LIST OF ACRONYMS

ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black and Mediterranean Seas and Contiguous Atlantic Area
AECID	Agencia Española de Cooperación Internacional para el Desarrollo (Spanish Agency for International Development Cooperation)
AEWA	African Eurasian Migratory Waterbirds Agreement
CAMP	Coastal Area Management Programme
CBD	Convention on Biological Diversity
CMS	Convention on Migratory Species
COP10-CBD	The tenth meeting of the Conference of the Parties to the CBD
COP17	The 17th Ordinary Meeting of the Contracting Parties to the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean.
DAR-IAURIF	Dar Al Handasah - Institut d'Aménagement et d'Urbanisme de la Région de l'Ile-de-France
EIA	Environmental Impact Assessment
IEE	Initial Environmental Examination
FAO	Food and Agriculture Organization of the United Nations
FFEM	Fonds Français pour l'Environnement Mondial
GFCM	General Fisheries Commission for the Mediterranean
GIS	Geographical Information System
GoL	Government of Lebanon
IMAC	The Integrated Management of East Mediterranean Coastline
IUCN	International Union for Conservation of Nature
MAVA	MAVA Foundation
MEDWETCOAST	Conservation of Wetlands and Coastal Zones in the Mediterranean
MOA	Ministry of Agriculture
MOE	Ministry of Environment
MPA	Marine Protected Area
MoT	Ministry of Tourism
MWC	MedWetCoast Project
NAP	National Action Plan
NBSAP	National Biodiversity Strategy and Action Plan
NCSR	Northwest Center for Sustainable Resources
NGO	Non-Governmental Organization
OAPN	Organismo Autónomo Parques Nacionales Autonomous Office for National Parks (Spain)
PA	Protected Area
PAP	Protected Areas Project
PINR	Palm Islands Nature Reserve
RAC/SPA	Regional Activity Centre for Specially Protected Areas
RAMSAR	The Convention on Wetlands of International Importance, especially as Waterfowl Habitat
SAP-BIO	Strategic Action Plan for the Conservation of Biological Diversity in the Mediterranean Region
SISPAM	Sustainable Institutional Structure for Protected Areas Management
SPA	Specially Protected Areas
SPAMI	Specially Protected Areas of Mediterranean Importance
TCNR	Tyre Coastal Nature Reserve
TRAGSA	Empresa de Transformacion Agraria S.A., Spain
UNDP	United Nations Development Programme

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Ministerial foreword

تمثل البيئة البحرية للمجتمع والاقتصاد اللبناني شكلا هاماً من أشكال رأس المال الطبيعي الذي يقوم بإمدادنا بالعديد من السلع والخدمات، منها المباشر كالمأكولات البحرية والأدوية والبترول والمواد الخام، ومنها الخدمات الاخرى كقدرة النظم البيئية على استعادة كفاءتها وتنوع الجينات الوراثية والقيم الجمالية. هناك ايضا المنافع غير المباشرة ومنها الدعم البيولوجي وتنقية المياه والهواء وادراكنا للمنافع التلقائية الناتجة عن البيئة البحرية على سبيل المثال الرضا الذي نشعر به عند معرفتنا أن البيئة يتم حمايتها للأجيال القادمة، وجميع هذه المنافع تؤثر على قراراتنا في استثمار او المحافظة على الموارد البحرية. ان الحكومة اللبنانية تتفهم عملية اتخاذ القرارات الفعالة المتعلقة ببيئتنا البحرية. من هذا المنطلق تقوم وزارة البيئة بالتعاون مع الاتحاد العالمي لصون الطبيعة بتنفيذ مشروع " دعم أدارة الانواع والبيئات البحرية الهامة في لبنان 2010-2012 " بهدف دعم وتطوير شبكة من المحميات البحرية مدعمة ببرنامج رصد بيئي لتقييم فاعلية إدارة هذه المحميات. ان الهدف الرئيسي لوزارة البيئة والاتحاد العالمي لصون الطبيعة هو خلق بيئة بحرية صحية ومنتجة وذات تنوع بيولوجي غني. لهذا أعطت وزارة البيئة الأولوية للاستراتيجية الخاصة بالمحميات البحرية التي اعدت ضمن اطار هذا المشروع نظراً للأهمية التي تشكلها هذه الاستراتيجية في زيادة نسبة المواقع البحرية المحمية ذات التنوع البيولوجي الهام في لبنان استناداً الى دور وزارة البيئة في انشاء المناطق المحمية.

The marine environment is important to the society and the economy. It represents a form of natural capital providing value in stocks and flows of goods and services, directly as seafood, pharmaceuticals, oils and additives. It also supplies many services, some of which are critical to human health, such as ecosystem resilience, genetic diversity and aesthetic appreciation. Indirect benefits (e.g. biological support and water and air purification) and passive-use benefits (e.g. the satisfaction that we get from knowing that the environment has been preserved for future generations) influence our decisions to exploit or to conserve marine resources.

The Lebanese Government understands the importance of effective decision-making for our seas. Accordingly, the Ministry of Environment (MoE) and the International Union for Conservation of Nature (IUCN) are implementing the project "Supporting Management of Important Marine Habitats and Species in Lebanon" (2010-2012) to support the development of a network of Marine Protected Areas (MPAs) and an associated monitoring program to evaluate their management effectiveness.

The Ministry of Environment in Lebanon and the IUCN are aiming to achieve a **healthy, productive, and biologically diverse marine environment.** That is why we brought forward the Marine Protected Areas Strategy which was developed within the context of this project for its importance in increasing the percentage of marine protected areas of particular importance for biodiversity in Lebanon according to the Ministry's mandate to establish protected areas.

Nazem El Khoury
Minister of Environment

IUCN foreword

The Mediterranean region is one of the most intensely and historically important regions on the planet with 7% of the world's population living along the coast of the Mediterranean Sea which is highly impacted by 32% of international tourism. The Sea covers only 0.8% of the total surface of world's oceans, but includes 7% of all known marine species. Marine protected areas have gained world recognition as effective tools to protect the marine environment, and a strong effort has recently been made in the Mediterranean to create special protection of sites perceived to contain the most valuable marine habitats and species. Marine protected areas are however, not distributed in an ecologically coherent and representative network, most of them being located along the northern shore of the Mediterranean Sea.

The Marine Protected Areas Strategy for Lebanon found in this volume has been spearheaded by the Ministry of Environment of the Republic of Lebanon, in cooperation with the International Union for Conservation of Nature (IUCN) with the support of other partners such as the Regional Activity Centre for Specially Protected Areas (RAC/SPA), the Spanish Agency for International Cooperation (AECID), the Autonomous Office for National Parks of Spain (OAPN) and the MAVA Foundation. The Strategy is an important step toward increased protection of the fragile coastal zones of eastern Mediterranean countries.

We must significantly step up the protection of vulnerable ecosystems and key biodiversity areas, especially of our seas where we are witnessing change on an unprecedented scale. The management effectiveness of Mediterranean marine protected areas must be improved to achieve the objective of the Biodiversity Convention in 2020. IUCN is involved through its Centre for Mediterranean Cooperation and its Global Marine and Polar Programme in a number of pragmatic initiatives to preserve and restore the biological integrity, and to improve the governance of the Mediterranean Sea in partnership with regional actors that have long been active in this field. These include the Regional Activity Centre for Specially Protected Areas, WWF, the ACCOBAMS (Agreement on the Conservation of Cetaceans in the Black Sea Mediterranean Sea and Contiguous Atlantic Area), the General Fisheries Commission for the Mediterranean (GFCM), the MedPAN (the network of managers of marine protected areas in the Mediterranean) and the scientific community as well as National Authorities of the region.

IUCN and the Government of Lebanon are committed to working together and building on this Strategy with the aim of creating a network of marine protected areas that contributes to the health of Lebanon's sea and marine environment.

Julia Marton-Lefèvre

Director General of IUCN
(International Union for Conservation of Nature)

Executive summary

Marine protected areas (MPAs) have gained world recognition as effective tools to protect the marine environment, and are much in favour in the Mediterranean, where about a hundred of them have been declared during recent decades to grant special protection to sites perceived to contain the most valuable marine habitats and species. Embattled by the complexities of saving their sea as a whole, the Mediterranean nations have resolved to carve out their remaining crown jewels from the sea, and struggle to conserve them through MPA designations.

In Lebanon, there are two legally declared marine protected areas: the Palm Islands Nature Reserve in North Lebanon and the Tyre Coast Nature Reserve in South Lebanon. Presently, the MoE and IUCN are implementing with OAPN, AECID and MAVA funding the project **"Supporting Management of Important Marine Habitats and Species in Lebanon"** (2010-2012) to support the development of a network of Marine Protected Areas (MPAs) and an associated monitoring program to evaluate their management effectiveness. So far, the project has assessed the feasibility of declaring three marine protected areas (Ras El Chekaa cliff, Batroun site and the Medfoun site), and carried out detailed biodiversity assessment and inventories in those sites and produced related GIS maps.

The Ministry of Environment in Lebanon and the IUCN, with the support of other partners such as the RAC/SPA and UNDP, are aiming to achieve a **healthy, productive, and biologically diverse marine environment.** To achieve this aim, it is important to enhance the consistency between marine and land-based policies and to create a well-managed, ecologically coherent network of marine protected areas (MPAs) in Lebanese waters. This Strategy sets out how the policy related to the marine environment fits within the Government's wider policy framework and what can be achieved by creating the network, how the available tools can be used and how collaboration with various organizations must be achieved to create this network.

The benefits of a network of marine protected areas are numerous, diverse and include ecological, social, economic and cultural elements. The drive for a National Marine Protected Areas Strategy is derived from the need for a cooperative and collaborative approach to the development of a network of national marine protected areas in Lebanon as a means to help address the declining health of our sea. The intent of this Strategy is to set the national priority actions needed for the establishment of new marine protected areas in Lebanon and for the proper management of existing and new MPAs, and to define the type of interventions needed at technical, research, regulatory, policy, institutional, financial, educational, capacity building, communication and promotion levels.

This Strategy defines the following goal:

The establishment of a network of marine protected areas, established and managed within an integrated marine management framework, that contributes to the health of Lebanon's sea and marine environment.

To achieve this goal, this Strategy aims to fulfil the following objectives:

— To establish a more systematic approach to marine protected areas planning and establishment;

— To enhance collaboration for management and monitoring of marine protected areas;

— To increase awareness, understanding and participation of the local community in the marine protected areas network; and

— To link Lebanon's network of marine protected areas to Mediterranean networks.

Madeira Rockfish *(Scorpaena maderensi).* © Hany El Shaer.

ملخص تنفيذي

إن المحميات البحرية أداة عالمية لحماية البيئة البحرية، وتتميز هذه المحميات البحرية بطابع خاص في البحر الابيض المتوسط حيث تم إعلان المئات من المحميات البحرية خلال العقود الماضية لضمان حماية مواقع تحتوي على أنواع وبيئات بحرية مميزة. وعلى الرغم من التعقيدات التى تعوق حماية البحر الأبيض المتوسط ككل, فإن شعوب البحر الأبيض المتوسط تبذل مساعي لصون وحماية البحرالمتوسط عن طريق إنشاء وإعلان محميات بحرية. **في لبنان**, تم إعلان محميتين بحريتين: محمية جزيرة النخل وجزيرة سنني وجزيرة رامكين الطبيعية في شمال لبنان ومحمية شاطئ صور الطبيعية في جنوب لبنان. تقوم وزارة البيئة اللبنانية حالياً" بالتعاون مع الاتحاد العالمي لصون الطبيعة (IUCN) وتمويل من OAPN, MAVA, AECID بتنفيذ مشروع: **" دعم أدارة الأنواع والبيئات البحرية الهامة في لبنان"** (2010-2012) بهدف تطوير وإنشاء شبكة من المحميات البحرية مدعمة ببرنامج رصد بيئي للتمكن من تقييم فعالية إدارتها. تشمل أنشطة المشروع اجراء مسح ميداني في ثلاث مواقع بحرية تمهيدا لإعلانها محميات بحرية (رأس الشقعة - البترون - المدفون) وذلك عن طريق دراسة التنوع البيولوجي المتواجد فى هذه المواقع وإنشاء قواعد بيانات جغرافية للتنوع البيولوجي تستخدم في برنامج الرصد البيئي البحري لهذه المواقع. إن هدف وزارة البيئة اللبنانية والأتحاد العالمي لصون الطبيعة, هو تحقيق بيئة بحرية لبنانية **صحية, منتجة, وتتميز بغنى في التنوع البيولوجي**. لتحقيق هذا الهدف يجب التشديد على أهمية التداخل والتكامل بين السياسات المتعلقة بالأنشطة البرية وتلك المتعلقة بالأنشطة البحرية وكذلك على أهمية التعاون مع الشركاء المحليين ومع الشركاء الدوليين مثل برنامج الأمم المتحدة للتنمية (UNDP) ومركز النشاطات الأقليمية للمناطق المحمية الخاصة (RAC/SPA). وهنا تتضح أهمية أنشاء شبكة من المحميات البحرية تكون متصلة بيئياً وتدار بصورة جيدة في المياه اللبنانية. ان هذه الاستراتيجية الخاصة بالمحميات البحرية توضح كيف يمكن ادماج سياسة المحافظة على البيئة البحرية داخل الاطار الحكومي الاوسع وما يمكن تحقيقه من إنشاء شبكة المحميات البحرية, وكيف يمكن استخدام الادوات المتاحة حالياً والعمل مع المؤسسات اللبنانية المختلفة لانشاء هذة الشبكة.

إن منافع إنشاء شبكة محميات بحرية لبنانية هي متعددة ومتنوعة وتتضمن منافع بيئية, أجتماعية, اقتصادية وثقافية. إن دافع إعداد هذه الاستراتيجية الوطنية ناتج من الحاجة الى منهج تعاوني لتطوير شبكة محلية من المحميات البحرية بهدف المساعدة في الحفاظ على البحر اللبناني وحمايتة من التدهور وذلك من خلال إنشاء محميات بحرية جديدة في لبنان وتأمين الادارة المناسبة واللازمة للمحميات البحرية الموجودة والمستقبلية وتوضيح الدعم المطلوب سواء كان فنياً, بحثياً, تنظيمياً, سياسياً, مؤسساتياً, مالياً, تعليمياً, مستوى بناء القدرات, التواصل والتسويق.

أن هذه الاستراتيجيه تهدف الى:

إنشاء شبكة من المحميات البحرية, تؤسس وتدار من خلال إطار اداري متكامل وتشاركي يساهم فى صحة البحر اللبناني والبيئة البحرية.

للتوصل الى هذا الهدف , إن الاستراتيجيه تسعى لتحقيق الاتي:

- انشاء منهج منظم لتخطيط وانشاء المحميات البحرية.
- تفعيل التعاون المتعلق بالادارة والرصد البيئي للمحميات البحرية.
- زيادة الوعي البيئي البحري, ومشاركة المجتمع المحلي في إنشاء شبكة المحميات البحرية.
- ربط شبكة المحميات البحرية اللبنانية بشبكة المحميات البحرية للبحرالابيض المتوسط.

1.1. Lebanon's marine environment and threats

The Lebanese coastline extends over 240 km in length. The coastal area, which constitutes around 8% of the total area of the country, comprises 33 % of the total built-up area in the country and hosts 55% of the total population (Dar Al-Handasaah & laurif, 2003). The Lebanese coastal area is part of the Mediterranean region that is considered a global biodiversity hotspot. It supports an amazing diversity and abundance of marine life and human activities, contributing to the Lebanese economy and offering enormous potential for future economic, social and cultural benefits. Coastal zones are ideal places where different economic activities meet due to the wide range of services provided by coastal ecosystems. The industrial sector is considered the most developed sector on the coast of North Lebanon and it is the main contributor to the coastal economic activity. It provided almost 57.5% of the northern coast partial GDP in 2005 followed by the energy and water supply sector (14.5%), market services (mainly tourism) with 12.1%, agriculture in terms of fishing and extraction (7.5%), government (mainly municipalities) with 6.8%, and finally transportation and communications (1.7%). The 2006 assault on Lebanon and the Nahr al-Bared refugee camp hostilities in 2007 resulted in huge losses for the whole economic sector (IMAC, 2009).

Experts (Coll *et al.*, 2010) listed approximately 17,000 marine species occurring in the Mediterranean Sea. Hundreds of Mediterranean species of phytoplankton, algae, lichens, mushrooms, phanerogams, zooplankton and benthos, in addition to 357 fish species were reported in Lebanon, as well as 21 species of cephalopods, 4 species of turtles and 6 marine mammals (CAMP, 2003).

Lebanon's coast suffers from strip and winter storms, extraction of sand from beaches, establishment of ports, recreation and encroachment on public lands, which reduces the proportion of marine sediments and leads to sediment environmental scarcity. Small numbers of sandy beaches are left in good condition: Batroun, Jbeil, Al Muaameltein, and White Sand in Beirut and Tyre in the south. Threats to the great potential offered by the coast already exist, such as uncontrolled urban sprawl, increased privatization of the shorefront, reduced public access to the beach, solid waste dumping, wastewater discharges, sea filling and sand extraction. Furthermore, the increased interest in the use of the coastal zone and its resources has led to conflicting interests among different coastal users. If immediate and appropriate measures are not taken to mitigate the impacts generated by natural processes and human activities, the marine environment along the coast and the quality of life of its inhabitants will deteriorate (IMAC, 2009).

Sea pollution was best exemplified by the war in July 2006 which caused a devastating oil spill affecting an important part of the Lebanon coastline including the Palm Islands Nature Reserve in North Lebanon. Subsequent to this, several activities were undertaken to clean up the sea and shoreline, followed by additional measures to maintain healthy and productive sea ecosystems which allow the Lebanese to benefit from the economic, environmental, cultural and recreational services that their sea has to offer. This will help in maintaining a healthy and productive sea include the development of a National Marine Protected Areas Strategy which will guide the establishment of a comprehensive and coordinated network of marine protected areas in Lebanon.

Lebanon's marine and coastal ecosystems continue to decline due to an ever-increasing range of threats, including coastal urbanisation, land and sea-based sources of pollution such as sewage and oil dumping, habitat degradation, unsustainable fisheries, an increasing demand on marine resources, invasive species and larger-scale impacts such as global climate change. The area of the Lebanese coast is limited; it ranges from 8% to 16% of the area of Lebanon. The coastal length is 235 km (from Al Arida in the North to Ras Naqoura in the South), its width ranges from 5 to 500 metres. Around 55-60 % of Lebanon's population live on the Lebanese coast, which is contaminated because of high population density and the concentration of active industrial and commercial ports which include 4 commercial ports, 15 fishing ports, 12 oil pipelines and three power stations run on fuel. This region contains many institutions, industrial units, commercial (10%) and agricultural areas (41%), recreation sites (7.5%) and port space (5.3%) and facilities, barriers and dunes (4% length of 49 km) and protrusions of rock (4.7% length of 11 km). All the sandy beaches in Lebanon constitute not more than 20 percent of the Lebanese coast as a whole. The widest point, such as the sandy beach of Tyre, is only one kilometre wide, a few metres deep and 10 metres thick. These quantities are considered as very limited globally (Dar Al-Handasaah & IAURIF, 2003).

1.2. International agreements and commitments

National protection of the Marine Protected Areas in Lebanon —mainly the marine & coastal nature reserves— is influenced by several international conventions and agreements that have either been signed or ratified by the Lebanese government. These conventions include:

— The Barcelona Convention for the protection of the Mediterranean Sea against pollution (signature by the GoL on 16/2/1976, accession in 30/6/1977 through legislative decree no. 126) and its amendments (Adhesion by the GoL on 16/10/2008 through law no. 34).
— The Convention on Biological Diversity (CBD) (signature by the GoL in 1992 and ratification on 11/8/1994 through Law no. 360).
— The United Nations Convention on the Law of the (signature and ratification by the GoL in 1995).
— The Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat (Adhesion by the GoL on 23/2/1999 through Law no. 23)
— The African-Eurasian Migratory Water Birds Agreement (AEWA) (Ratification by the GoL on 13/6/2002 through Law no. 412).
— The Agreement on Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic area (ACCOBAMS) (Adhesion by the GoL on 5/2/2004 through Law no. 571).
— The UNESCO Convention on the Protection of Cultural and Natural Heritage (Adhesion by the GOL in 30/10/1990 through Law No 19).

THE BARCELONA CONVENTION FOR THE PROTECTION OF THE MEDITERRANEAN SEA AGAINST POLLUTION

Lebanon is a party to the Barcelona Convention and its 6 protocols. The Convention aims (among other objectives) to ensure the sustainable management of natural marine and coastal resources, to protect the marine environment and coastal zones, and to protect natural and cultural heritage.

The existing marine & coastal nature reserves in Lebanon (Palm Islands and Tyre Coast Nature Reserves) and the future proposed MPAs once declared will contribute to the implementation of the Barcelona Convention by the Government of Lebanon and to the achievement of its objectives as well as the implementation of its protocols, in particular the Protocol on Specially Protected Areas and Biodiversity. Lebanon adhered to the Protocol on Specially Protected Areas (SPA Protocol) on 22/2/1994 through the law no. 292 but it has not yet adhered to the new amended Protocol: Protocol on Specially Protected Areas and Biodiversity. The Protocol aims at promoting the conservation and sustainable management of areas having a particular natural or cultural value, and at promoting the conservation of animal and vegetable species endangered or threatened.

The Palm Islands Nature Reserve (PINR) was declared a Specially Protected Area under the SPA Protocol in 1995. The PINR is a hot stopover used by sea-crossing migratory birds and the only site in Lebanon for sea bird breeding, a habitat of plants that are no longer found on the eastern Mediterranean littoral, including threatened and endemic species, and an important site for threatened marine turtles and endangered and globally threatened bird species; it thus constitutes in general an important area for marine diversity and habitats.

The Tyre Coast Nature Reserve (TCNR) is an important nesting site for globally endangered Mediterranean Loggerhead and Green sea turtles, a site containing a wide diversity of ecosystems; marine, agriculture, wetland, that have Mediterranean characteristics. The TCNR is also located on major migratory routes where internationally important bird species have been identified.

In 2011, the Government of Lebanon through the Ministry of Environment submitted formally to RAC-SPA two presentation reports to propose the nomination of the PINR & TCNR as SPAMIs under the Protocol, and the two nature reserves were included in the SPAMI List during CoP17 of the Barcelona Convention (Paris, February 2012).

Consequently, the law establishing the existing MPAs in Lebanon (PINR and TCNR) and the management plans developed for each site, in addition to the various actions implemented in these two marine nature reserves for the protection and management of these sites and their existing marine and coastal biodiversity (mainly endangered marine turtles and birds), are contributing to the implementation of the articles of this protocol and its various

action plans, mainly: Action plan for the conservation of Marine Turtles, Action Plan for the conservation of bird species, Action Plan on marine vegetation in the Mediterranean Sea.

In addition, the biodiversity surveys and mapping that are being done in the candidate MPAs in Lebanon and their future declaration as nature reserves to be a part of a national network of MPAs in Lebanon will promote the conservation and sustainable management of these sites and conservation of the endangered and threatened species that they harbour, and consequently this will constitute an important step towards executing the provisions this protocol. Furthermore, these studies will also be used to propose the nomination of these sites (once declared as nature reserves) as SPAMIs.

THE CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

The CBD was adopted by the United Nations Conference on Environment and Development, also known as the Earth Summit, that was held in Rio de Janeiro in 1992. The CBD has three objectives: 1) the conservation of Biological Diversity 2) the sustainable use of Biological Diversity 3) the equitable and fair sharing of benefits arising from the use of genetic resources. Lebanon is a party to the CBD and the Ministry of Environment is the National Focal Point for the Convention. The CBD text dedicated an entire article (Article 8) to in-situ conservation; according to this article "Each Contracting Party shall, as far as possible and as appropriate, establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity…"

The existing marine & coastal nature reserves in Lebanon (Palm Islands & Tyre Coast Nature Reserves) and the proposed marine & coastal sites to be declared as nature reserves in Lebanon and the creation of a national network of marine protected areas in Lebanon will be part of actions implemented by the Government of Lebanon to fulfil the requirements of the CBD, mainly its article 8 on in-situ conservation.

Furthermore, the tenth meeting of the Conference of the Parties (COP10) to the CBD held in October 2010, in Nagoya, Aichi Prefecture, Japan, adopted through decision X/2 the Strategic Plan for Biodiversity 2011-2020 and its 20 Aichi Biodiversity Targets. "Target 11" of the afore-mentioned Strategic Plan states the following: "By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes."

Accordingly, the present National Strategy on Marine Protected Areas in Lebanon will contribute towards achieving the Aishi Biodiversity targets by Lebanon, in particular target 11, setting national objectives in response to the Strategic Plan for Biodiversity 2011-2020 and its Biodiversity Targets, thus fulfilling the requirements of decision X/2 of the COP10 which requests the parties to develop national and regional targets, using the Strategic Plan and its Aichi Targets, as a flexible framework, in accordance with national priorities and capacities.

In addition, the CBD has many programmes of work including two programmes of work directly related to marine & coastal protected areas: 1) the programme of work on protected areas, 2) the programme of work on marine & coastal biodiversity.

The Programme of Work on Protected Areas (POWPA) includes 16 goals, divided across 4 programme elements. Goal 1.1 of the POWPA and its related target state the following:

Goal 1.1: To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals.

Target: By 2010 terrestrially and 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area systems is established.

The National Strategy on Marine Protected Areas in Lebanon and the national network of marine protected areas proposed to be established in Lebanon will help Lebanon to implement the two programmes of work of the CBD on marine & coastal biodiversity and on protected areas (POWPA), mainly goal 1.1 of the POWPA, and accordingly to fulfill the obligations of the Government of Lebanon towards the Convention.

THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA (UNCLOS)

Signed in 1982, came into force in 1994. It defines the rights and responsibilities of nations in their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of marine natural resources.

RAMSAR CONVENTION ON WETLANDS

The Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat aims at ensuring the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world. Article 2 of the Ramsar Convention states that "Each Contracting Party shall designate suitable wetlands within its territory for inclusion in a List of Wetlands of International Importance…"

Lebanon, through its Ministry of the Environment, is a contracting party to the RAMSAR Convention, and it includes four sites declared as Ramsar sites under the Convention, of which three are marine & coastal sites, and two of these three are legally protected:

1- The Palm Islands Nature Reserve (PINR) is a marine site located in North Lebanon. The PINR was declared a Wetland of international importance or Ramsar Site under the Ramsar Convention in 2001 (Ramsar site Number 1079).

2- The Tyre Coast Nature Reserve (TCNR) is a coastal & marine site located in South Lebanon. The TCNR was declared a Wetland of international importance or Ramsar Site under the Ramsar Convention in 1999 (Ramsar site Number 980).

3- Ras El Chekaa is a marine and coastal area proposed as a site to be declared as an MPA, located in North Lebanon. The coastal part is a private religious property. The site was declared a Ramsar Site in 1999 (Ramsar site Number 979).

4- Ammiq Wetland is one of the last remaining inland wetland ecosystems of significant size in Lebanon. It is located in the Bekaa plain and is a private property; efforts are being deployed by the

landowners for its protection and management. The site was declared a Ramsar Site in 1999 (Ramsar site Number 978).

The four Ramsar sites in Lebanon are known for their important location on the Middle East bird migration route. Since the PINR and TCNR Ramsar sites are declared as nature reserves by national law (Law no. 121 of 9/3/1992 declaring the PINR and Law no. 708 dated 5/11/1998 declaring the TCNR), these wetlands have national legal protection and the Ministry of Environment is the national administrative authority over them (being nature reserves). Each site has a local committee (established through a decision from the Minister of Environment) responsible for the protection and management of the site under the overall supervision of the Ministry of Environment, a management team responsible for the implementation of daily management activities, and a management plan. Accordingly, the national legal protection of these Ramsar sites in Lebanon as well as the provisions of their management plans contribute towards fulfilling the requirements of the Ramsar Convention by the Government of Lebanon. In addition, the Ras El Chekaa site is a candidate MPA included among the list of proposed MPAs by the Ministry of Environment, and a detailed biodiversity survey and mapping were carried out by the Ministry (through the IUCN project) in this site in this regard, therefore its future legal protection at national level will enhance the conservation of this Ramsar site.

Furthermore, the biodiversity surveys and mapping that are being carried out in the candidate MPAs in Lebanon and their future declaration as nature reserves will promote the conservation and the wise use of these sites and consequently will constitute an important national action to achieve the objective of the Ramsar Convention; these studies will also be used to propose the inclusion of these sites in the List of Wetlands of International Importance under the Ramsar Convention as requested by article 2 of the Convention.

THE AFRICAN EURASIAN MIGRATORY WATER BIRD AGREEMENT (AEWA)

The AEWA agreement is one of the Agreements of the Convention of Migratory Species (CMS); AEWA aims to contribute to global biodiversity conservation by furthering migratory water bird conservation at flyway level. Lebanon is a contracting party to the AEWA, and the Ministry of Environment is the national focal point. The protection and management of the existing MPAs (PINR & TCNR) and the future declaration of the candidate MPAs will contribute to the conservation of these important habitats for water birds and the protection of the bird species that these sites harbour, especially as the PINR was declared as an IBA (Important Bird Area) by Birdlife International in 1994 and the TCNR is also a site located on major migratory routes of internationally important bird species.

In fact, there are a total 222 bird species recorded in the TCNR; seven of them are classified as globally threatened species as per IUCN Red List categories for 2007 and eight others are classified as regionally threatened species. In the PINR, there are a total 173 registered bird species in the NCSR inventory, thirteen of them are classified as globally threatened species as per IUCN Red List categories for 2007; two endangered (EN), three vulnerable (VU), and eight near threatened species (NT) and only two are species restricted to the Middle East. This species representation indicates a high proportion of Mediterranean and European migratory species using the PINR.

More specifically, some of the species recorded in the Palm Islands and Tyre Coast Nature Reserves are listed in Table 1 of Annex 3 of the AEWA. Some are listed under Column A Category 1: Populations which number less than around 10,000 individuals or Category 2: Populations numbering between 10,000 and 25,000 individuals, or Category 3: Showing significant long-term decline, and others are listed under Column B: Populations numbering more than around 100,000 individuals and considered to be in need of special attention as a result of showing significant long-term decline.

Consequently the two existing MPAs in Lebanon are important tools to protect the bird species in these sites, including those listed in Annex 3 of the AEWA and recorded in these two nature reserves; therefore, the law establishing MPAs and their management plans are important instruments to apply the AEWA and its Action Plans in Lebanon. The declaration of future MPAs in Lebanon will further contribute to the implementation of the AEWA since these candidate MPAs are important sites for many bird species.

THE UNESCO CONVENTION ON THE PROTECTION OF CULTURAL AND NATURAL HERITAGE (WORLD HERITAGE CONVENTION)

The convention's main objective is to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity. In Lebanon, there are five sites listed in the World Heritage Convention:

1- Byblos: Cultural site

2- Tyre: Cultural site

3- Sidon: Cultural site

4- Anjar: Cultural site

5- Qadisha Valley + Bsharre' Cedar Forest: Cultural landscape.

Three of these World Heritage Sites are marine and coastal sites: Byblos, Sidon and Tyre cities. The Tyre Coast Nature Reserve (TCNR) is part of the city of Tyre, which was designated in 1984 by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as a World Heritage Site. In addition, the Ministry of Culture (MoC), through the Directorate General of Antiquities, is mandated over all archaeological and historical sites, including that of Ras el Ain (part of the TCNR), which is designated as national heritage through a governmental decree.

Consequently, the law establishing the TCNR, its management plan and the efforts deployed for its conservation and management by the local management committee and the management team of the reserve under the overall supervision of the Ministry of Environment, and the decree designating Ras El Ain (part of the TCNR) as national cultural heritage, and the efforts deployed by the Directorate General of Antiquities/Ministry of Culture for its conservation are contributing towards the implementation of the provisions of the UNESCO Convention on World Heritage.

The old city of Byblos is also designated as national heritage through a governmental decree under the responsibility of the Directorate General of Antiquities/Ministry of Culture. Furthermore, the port and marine part of the Byblos World Heritage site are on the list of candidate MPAs of the Ministry of Environment (MoE), and a preliminary biodiversity field survey and mapping were car-

Physeter catodon. ISHMAEL Project. © Maurizio Würtz – Artescienza s.a.s.

ried out by the MoE (through the IUCN project) on this site in this regard. Therefore, the declaration of this site as a nature reserve and its legal national protection and sustainable management will also be important tools in achieving the requirements of the UNESCO Convention on the Protection of Cultural and Natural Heritage.

ACCOBAMS

The ACCOBAMS agreement is one of the Agreements of the Convention of Migratory Species (CMS); it aims to reduce threats to cetaceans in Mediterranean and Black Sea waters, to improve our knowledge of these animals, and to promote closer cooperation amongst Parties with a view to conserving all cetacean species present in the area.

ACCOBAMS covers large and small cetaceans. It applies to all cetaceans that have a range that lies entirely or partly within the Agreement area, or that accidentally or occasionally frequent the Agreement area.

Lebanon is a contracting party to ACCOBAMS and the National Centre for Scientific Research/National Centre for Marine Sciences (NCMS) is the national focal point. The NCMS is carrying out regular monitoring on cetaceans in Lebanese waters, and the centre thus observed two species of dolphins in Lebanon: the Bottlenose dolphin *(Tursiops truncatus)* which was observed during 2010-2011 in many areas in Lebanese waters with high density in the marine area of Beirut, and the Striped dolphin *(Stenella coeruleoalba)* which was observed in the region of Enfeh in North Lebanon in November 2011. In addition, the NCMS observed the Sperm whale *(Physeter catodon)* in Beirut in February 2011.

The law establishing the current MPAs and their management plans, as well as the future laws and future management plans of the proposed MPAs once declared in Lebanon are important instruments to apply ACCOBAMS at national level and will contribute to the conservation of the cetaceans present in Lebanese marine waters.

1.3. Lebanese conservation laws related to marine and coastal areas

Lebanon has a large body of sector-specific environmental laws and regulations, some dating back to the 1920s and some new ones. The Law for fisheries in Lebanon dates back to 1928. Nevertheless, the Ministry of Agriculture (MoA) and FAO coordinated efforts to draft a "new" law "Law no. 2775 dated 1929" updating law of fishing in Lebanon. This draft version is now being discussed with stakeholders.

Environment Law 444/2002 embraces the polluter-pays-principle, as well as the Environmental Impact Assessment and Strategic Environmental Assessment process, to help curb pollution, including seawater pollution. Furthermore, when complete, the Master Plan for wastewater treatment in the coastal zone will significantly reduce environmental pollution in the Mediterranean Sea by treating wastewater from an estimated 2.5 million people. The Law 444 and the Master Plan apparently constitute a new framework for the protection and management of nature, including the sea.

To summarize, there are a number of legislations related to the conservation of marine and coastal habitats and biodiversity:

— Law no. 444/02 (Code of Environment) specifies, under Chapter VIII, the protection, conservation and management of nature and biodiversity.

— Law no. 708/98 declaring the Tyre Coast Nature Reserve on November 5, 1998.

— Law no. 121/92 declaring the Palm Islands Nature Reserve on March 9, 1992.

— Law no. 508/04 (hunting law) is the latest attempt for regulating and controlling hunting in terms of season, type of protected birds forbidden for hunting, amount and type of game birds along with a permit system based on hunting testing.

— The law, issued as decision no. 2775 dated 1929, relating to the control of marine & coastal fishing and its amendments.

— Decree no. 8213 dated 24/5/2012 relating to the "Strategic Environmental Assessment for Proposed Policies and Plans and Programs in the Public Sector" or SEA decree.

— Decree no. 8633 dated 7/8/2012 relating to the "Fundamentals of Environmental Impact Assessment" or EIA decree. According to this decree, all major development, infrastructure and industrial projects are subject to EIA or IEE studies including their effects on biodiversity, in order to promote conservation activities and prevent the damage of the surrounding environment by these projects before receiving approval.

— Decision of the Minister of Agriculture no. 125/1 dated 23/9/1999 banning the fishing of marine turtles, monk seals and whales as well as selling, use or trade of any derivatives from the mentioned species.

— Decision of the Minister of Agriculture no. 1/385, issued January 26th, 1997, stating that fishing activities are prohibited in all estuaries all year round. The protected area involved extends over 500 m on each side of the estuary, 500 m inside the river and two kilometres seawards. All human activities are banned except for those of scientists and the Coast Guard.

In addition, many Ministerial Decisions regulating fishing and fishing techniques are issued by the ministry of Agriculture (MoA), mainly:

— Decision of the Minister of Agriculture no. 346/1 dated 15/7/2010 regulating and identifying fishing types and equipment and banning the use of small mesh sizes and trawling nets and fishing using scuba diving equipment.

— Decision of the Minister of Agriculture no. 93/1 dated 14/3/2008 regulating scuba-diving industry including permitting procedures and safety measures and scuba-diving fishing.

— MoA decisions banning dynamite fishing.

Sponges at Enfeh
© Hany El Shaer.

1.4. Role and responsibilities of the different stakeholders

Lebanon has a range of legislative and policy tools to establish and manage marine protected areas. The Ministry of Environment has specific mandate in this regard and needs to develop this Strategy to establish and manage a network of marine protected areas in Lebanon and exchange regional experience in this regard.

In addition, the MoE will be seeking the cooperation of other administrations having a mandate and responsibilities in marine-related issues such as the Ministry of Agriculture, Ministry of Public Works and Transport, Ministry of National Defence, Ministry of Interior and Municipalities as well as other stakeholders such as local NGOs, Fishermen's Orders and local communities to ensure the proper management of MPAs by using a participatory approach. This strategy was prepared in cooperation with different stakeholders. The annex contains the list of interviewed stakeholders.

Mandate of the following public administrations in relation to marine areas conservation, management and control is defined as follows:

— The Law no. 690 dated 26/8/2005 organising the Ministry of Environment and defining its mandate, states that the MoE is responsible for the establishment, protection and management of protected areas.

— The Law no. 214 dated 2/4/1993 (Establishment of the Ministry of Transport) and its amendments (law no. 247 dated 7/8/2000) state that the Ministry of Public Works and Transport (MoPWT) is mandated to control the implementation of the legislation and rules related to transport and marine public properties.

— 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.

— The decree no. 22 dated 22/1/1981 (Organization of the Army) states that the Marine Forces in the Army are responsible for coast defence. Therefore, the Ministry of Defence / Lebanese Army is in charge of patrolling the sea and keeping its activities in order.

Fisherman. © Nabigha Dakik.

Fisherman at Dora port. © Hany El Shaer.

1.5. Role of the Ministry of Environment in establishing and managing MPAs

The Ministry of Environment (MoE) is the administrative authority over the nature reserves in Lebanon and is responsible for their supervision, protection and management. Law no. 690 dated 26/8/2005 organising the Ministry of Environment and defining its mandate states that the MoE is responsible for the establishment, protection and management of protected areas. The MoE proposes the establishment of a site as a "Nature Reserve" based on a literature review and field biodiversity assessment that prove the richness of the site in terms of biodiversity, mainly in rare, endemic and endangered species

Once the scientific studies and base maps and necessary documents are developed for the proposed site, the MoE develops the draft law establishing a specific site as a nature reserve and after consultation with, and approval of, the main stakeholders, mainly relevant municipalities and local communities, the MoE submits the draft law to the Council of Ministers to be approved and transmitted to the Parliament for its endorsement. Once the law is issued, the site is declared a nature reserve and the necessary administrative steps will be taken by the MoE for its management.

The MoE appoints a committee, "Appointed Protected Area Committee" (APAC), which includes representatives from local environmentalists, concerned municipalities, NGOs and universities for local management of the reserve. The APAC is appointed through a Decision of the Minister of Environment and is the local body responsible for the management and protection of the nature 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) which is responsible for implementation of daily management activities in the site. The MoE allocates regular financial contributions to the APAC of each nature reserve to support its management; in addition the MoE has been providing significant guidance to APACs and management teams, including training and capacity building programmes (management plans development, resource mobilization, biodiversity monitoring, visitor management and carrying capacity etc.).

The Ministry of Environment is responsible, beside the APAC, for the protection, management, surveillance, employees' recruitment, monitoring, maintenance & fundraising for the nature reserves. The responsibilities and obligations of the APAC were determined front Annex 1 of a letter from the Minister of Environment (Reference number 250/B/2003 dated January 29, 2003). This Annex states the mandate of the APAC at administrative, supervisory & planning and financial levels. Within these responsibilities, the APAC has the authority to investigate any damage that befalls on the nature reserve and legally pursue the responsible party; it can also appoint guards who are trained to maintain and protect the area. Other responsibilities include, but are not limited to, raising public awareness, managing the needs of the reserve and all financial matters.

A Management Plan is developed for each nature reserve to guide its management and its nature resources, biodiversity, visitors and the various activities (scientific research, education, awareness, recreational…). The various stakeholders are involved in the development of the Management Plan, mainly the APAC, the management team and the local communities, and it is endorsed by the Ministry of Environment. Recently, initiatives were taken by the Ministry of Environment which led to the endorsement of the new Management Plans of the Nature Reserves through a decree from the Council of Ministers.

The managing committee (APAC) of each nature reserve implements 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. The management team undertakes the daily implementation of the management activities under the supervision of the APAC. Each APAC is responsible, on behalf of the MoE, for the regular supervision and assessment of the implementation of the management plan, and is required to report regularly to the MoE on the planned and implemented actions, making any recommendations that the APAC sees necessary to improve the progress in implementation, and requesting the opinion of the MoE on the results of its assessment of progress.

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

— Periodically meet with the local Management Team (or other committee or agency lawfully responsible for the area) to assess progress and problems being encountered in implementation of the management plan.

— Periodically, in the company of the Management Team (or other committee or agency lawfully responsible for the area), inspect the reserve to observe its condition and compliance with the management plan.

— Prepare annual reports to the Ministry of Environment, incorporating the reports 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 compliance with, and implementation of, the management plan.

Regarding financial resources, in addition to the regular financial contribution of the MoE to the APAC of each nature reserve, each committee of the nature reserves is encouraged to actively mobilize funds to strengthen their management in order to reach auto-financial sustainability; through fund-raising activities, income-generating activities in the nature reserves, and through partnership with international organizations to secure necessary funds to implement needed activities in the nature reserve. The nature reserves have also benefited from international funded projects mobilized and executed by the MoE for protected areas (Protected Areas Project, MedWetCoast project, SISPAM project, IUCN project on "Supporting Management of Important Marine Habitats and Species in Lebanon" etc…); these projects supported the development of management plans, assessment and monitoring of biodiversity, development of awareness and education materials, training and capacity building programs, infrastructure in the nature reserves etc.

The Ministry of Environment has developed a series of legal and administrative texts for the Protected Areas in Lebanon, as follows:

1. The Ministry of Environment developed a draft framework Law on nature reserves in Lebanon, which was submitted to the Lebanese parliament for endorsement in April 2012 through decree no. 8045. This draft law addresses the establishment and management of nature reserves, and the related administrative and financial issues, since this law (1) defines the management objectives of the nature reserves, (2) regulates the establishment of nature reserves on public lands as well as private lands, (3) details the management structure of the nature reserves (APACs and management team) and formally recognizes the legal identity of the APAC, (4) addresses the financing mechanisms of the nature reserves, (5) grants the APAC the right to collect entrance fees and to impose fines upon violations, (6) uses zoning to encourage sustainable use inside the nature reserves besides the strict conservation zone.

2. The MoE developed a National Action Plan for Protected Areas (NAPPA) within the framework of the Stable Institutional Structure for Protected Areas Management Project (SISPAM, 2004-2006) executed by the MoE and UNDP and funded by the EU. The NAPPA outlines purposes, objectives, and tasks that need to be fulfilled in order to successfully manage protected areas in Lebanon. It is 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 priority activities and actions. Based on the NAPPA, the MoE developed a draft law programme to secure the necessary budget from the public treasury for the implementation of the activities foreseen in the NAPPA. Once the law programme is endorsed, the necessary funds will be allocated to finance the activities and actions outlined in the NAPPA.

3. The MoE, also under SISPAM, 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.

4. A national financial sustainable strategy for PAs that suggests alternative mechanisms for financing PA management (developed under SISPAM)

5. A database for available sources of funding for PAs among international sources which includes a list of potential donors, conditions and procedures for applications (developed under SISPAM)

6. A National Capacity Building Strategy for key players in PA management structure: MoE, APACs and management teams (developed under SISPAM)

7. A Management tool kit for Protected Areas (developed under SISPAM) including: (a) Monitoring and evaluation indicators for PA management, (a) Job description for PA management teams, (b) Policies and procedures for improved management.

1.6. Management structure of the existing MPAs

PALM ISLANDS NATURE RESERVE (PINR)

The PINR was established through Law no. 121 of 9/3/1992; it includes three islands: Palm, Sanani and Ramkin. The law states that a committee established through a decision from the Minister of Environment for a period of three years and including seven volunteers undertakes the activities related to protection, prevention, mobilization of scientific studies & expertise to ensure the ecological restoration of the nature reserve; the volunteers include the following:

— Representative of the Municipality of Tripoli,

— Representative of the Municipality of El-Mina,

— Stakeholders concerned in Ecology.

The current "Appointed Protected Area Committee" (APAC) of the PINR is formed by representatives of the:

— Municipality of Tripoli,

— Municipality of El-Mina,

— Lebanese University - Ornithology,

— Balamand University - Oceanology,

— Environment Protection Committee (NGO),

— Union of NGOs of the North Lebanon for Development, Environment and Heritage,

— Fishermen.

The management team in the case of the PINR includes at present only two rangers/guides and one secretary, but the process of recruitment of a manager for the reserve was initiated recently by the MoE and the APAC. During the visitation season (July-September), three rangers/workers join the original staff on daily-basis salary. Rangers and patrols are the essential means to protect, survey and control visitors and poachers. Recently, the reserve's rangers were empowered to issue fines to a poacher or anyone breaching the Law provided they (the rangers) were first sworn in by the governor. 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 in its training programme.

Management Plans were developed for the PINR and endorsed by the MoE: a Management Plan for the period 2000-2005 was prepared by the MoE through the consultation of experts from the IUCN within the PAP project (MoE/GEF/UNDP) and an updated draft Management Plan for the period 2008-2013 (not finalized and not published yet) which was the result of efforts made by the APAC, particularly its President, and recently guidelines for the management of the marine part of Palm Islands, were prepared in 2009 by Tragsa, and financed by the Spanish Development Agency, especially as the first management plan was almost entirely dedicated to the terrestrial areas of the reserve.

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

PINR: Ramkin Island seen from Palm Island. © Ghassan Garadi.

TYRE COAST NATURE RESERVE (TCNR)

The TCNR was established by Law no. 708 dated November 5, 1998. The law states that a committee established through a decision from the Minister of Environment for a period of five years and including five volunteers undertakes the management of the site; the volunteers represent the following institutions:

— Municipality of Tyre

— "Kaemakam" or Governor of the caza of Tyre

— Two local NGOs

— Ministry of Agriculture

The current managing committee (APAC) of the TCNR is formed by representatives of the:

— Ministry of Agriculture

— Kaemakam" or Governor of the caza of Tyre

— Municipality of Tyre

— Amwaj (NGO)

— The Protection of Environment - Tyre (NGO).

This committee (APAC) works under the overall supervision and support from the Ministry of Environment (MoE). The management team in the case of the TCNR includes at present the reserve's manager, 2 full-time rangers, 1 part-time ranger and an administrative assistant. A five-year Management Plan was developed for the TCNR. This Management Plan was prepared under the Med-WetCoast Project, which is an initiative under the Ramsar Convention. The regional project was executed in six countries over a period of 7 years from 1999 to 2006 and funded by the FFEM and national contributions from these countries. The national project was executed in Lebanon by the Ministry of Environment and managed by the UNDP from 2002 to 2006. The Management Plan was prepared as part of different components that aim at conserving the biodiversity of global and regional importance in the Mediterranean basin. The Management Plan was developed in consultation with the local stakeholders, and was endorsed by the Ministry of Environment (MoE) and recently by a decree from the Council of ministries (decree 8044 dated 25/4/2012) upon initiative and proposition from the MoE.

The TCNR beach is a sea turtle *(Caretta caretta)* nesting site.
RAC/SPA: Satellite tracking of marine turtles. © Nabigha Dakik.

1.7. Marine Protected Areas Network

FUNCTIONS AND BENEFITS OF THE MPA NETWORK

A key management strategy to address many issues affecting marine and coastal ecosystems and resources is the implementation of marine protected areas (MPAs). A marine protected area is a coastal or offshore marine area that is managed to protect natural and/or cultural resources. The International Union for Conservation of Nature (IUCN) classifies MPAs into 6 categories, ranging from highly protected reserves, intended only for scientific research or wilderness conservation, to multiple-use areas, created to foster the sustainable use of natural ecosystems and resources.

MPA networks can contribute to sustainable development goals by fostering integrated sea and coastal management through 3 interrelated functions and benefits:

1. Ecological: the network can help maintain functional marine ecosystems by encompassing the temporal and spatial scales of ecological systems.

2. Social: the network can help resolve and manage conflicts in the use of natural resources.

3. Economical: the network can facilitate the efficient use of resources.

NETWORK DESIGN AND APPROACH IN LEBANON

The objectives of the Lebanon MPA network are:

1. To conserve marine biodiversity and natural resources and

2. To address local marine resource management needs.

The scientific design of the Lebanon MPA network is based largely on a literature scientific assessment of biodiversity values and surveyed extensively through various field trips which included land inspection (supplemented by satellite images), snorkelling (tide pools and shallow areas of less than 5m depth) and SCUBA diving (5-20m depth) whenever appropriate. Interviews and discussions with local fishermen from various areas were particularly instructive and relevant.

IUCN Category		Main objective or purpose
IA	Strict Nature Reserve	Strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring.
IB	Wilderness Area	Protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.
II	National park	Protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities.
III	Natural monument or feature	Protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.
IV	Habitat/ species management area	Protected areas aim to protect particular species or habitats and management reflects this priority. Many category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.
V	Protected landscape/ seascape	A protected area where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.
VI	Protected area with sustainable use of natural resources	Protected areas are generally large, with much of the area in a more-or-less natural condition and where a proportion is under sustainable natural resource management and where low-level use of natural resources compatible with nature conservation is seen as one of the main aims of the area.

Table 1:
IUCN protected areas management categories
(IUCN 1994; Wells & Day 2004; WCPA 2008)

Fishermen in the PINR. © Khaled Allam.

CRITERIA FOR THE SELECTION OF PROPOSED MPAs IN LEBANON

The scientific design of the MPA network in Lebanon was developed through a 3-step process based on three types of criteria for the selection of those sites; involving expert scientific advice, targeted research and monitoring, and taking into account both the biophysical and socio-economic characteristics of the sites. The three types of criteria for the selection of proposed MPAs are:

Representation and replication criteria

The sites and/or MPAs network are selected in the aim of one or more of the following criteria should apply to site and/or MPAs network:

- The site conserves representative examples of each shallow-water habitat type and key sea habitats, including a "sufficient" number and area of each habitat type.
- The network is protecting at least 20% of each habitat type.
- The network aims to protect at least 3 replicate areas of each habitat type, and spreading them out geographically to reduce the possibility that all areas will be affected by the same disturbance.
- The network includes representative areas for specific species in order to maximize the number of species protected.
- The site is more likely to be resistant or resilient to global change.

Critical area criteria

The MPA network is selected in the aim of:

- **Each site includes key habitats,** such as: permanent or transient aggregations of fish species; turtle nesting areas; areas supporting high diversity; areas supporting species with limited abundance/distribution; areas that are preferred habitats for vulnerable species; areas that contain a variety of habitat types in close proximity to one another.

Connectivity criteria

Each MPA of the network is selected taking into account the following elements:

- Taking a system-wide approach that recognizes patterns of connectivity within and among systems (particularly seagrass beds, sponge caves and vermetid reefs).
- Where possible, including entire ecological units (e.g. whole offshore reefs) and a buffer around the core area of interest. If this is not possible, larger areas of continuous ecological units were included (e.g. coastal vermetid platforms).
- Maximizing acquisition and use of environmental information to determine best configuration, taking connectivity into account.
- Using rules of thumb for MPA network design, i.e. where possible MPAs were a minimum size of 10 km^2 (10 to 20 km in diameter) with a maximum spacing distance of 15 km between them.

Fishing technique at Ras Chekaa. © Hany El Shaer.

LIST OF PROPOSED MPAs IN LEBANON

Based on the criteria mentioned above, literature scientific assessment (Bariche, 2008; OCEANA, 2011; ACCOBAMS, 2010 and MoE reports) and extensive field surveys, the sites were selected due to their richness and importance in biodiversity, to be part of the MPA network of Lebanon. The network includes marine/coastal sites (9), estuary sites (5) and deep sea sites (1 or 4). These sites are:

— Proposed MPA coastal and marine sites:

1. Nakoura,
2. Sidon rocks,
3. Raoucheh cliffs and caves,
4. Beirout port outer platform,
5. Byblos,
6. Medfoun rocky area,
7. Batroun Phoenician wall,
8. Ras El Chekaa cliffs,
9. Enfeh Peninsula.

— Proposed MPA estuary sites:

10. Litani estuary,
11. Awally estuary,
12. Damour estuary,
13. Nahr Ibrahim estuary,
14. Arida estuary.

— Proposed MPA deep water site (or sites)

According to the declaration by the GFCM (with the agreement of all Mediterranean countries), a Fishery Restricted Area has been declared, banning trawling activities for all the Mediterranean in depths superior to 1,000 m. Inside Lebanon's territorial waters, this area represents about 1,240 km^2, including four specific features, as described by OCEANA (2010), namely:

15. Beirut Escarpment,
16. Saint Georges Canyon,
17. Junieh Canyon and
18. Sour Canyon.

Lebanon could envisage two options: declare the whole area under 1000 m in the territorial waters as an MPA, or declare the four features presented above as four MPAs as a deep sea network with a common management plan.

Part 3 of this document provides a short description of the main features (location, quality and importance, vulnerability, conservation status, habitat types, criteria applicable) and maps for each proposed site. For deep sea sites, a proposal for the management of specific activities is provided.

2. Strategy for Lebanon's Marine Protected Areas

This framework proposes strategic priorities for MPAs in Lebanon. These priorities are in harmonization with the requirements of the major international conventions in this field, in particular the biodiversity-related Conventions and Agreements ratified by the Government of Lebanon, mainly the Convention on Biological Diversity (CBD), the Specially Protected Areas and Biodiversity Protocol under the Barcelona Convention, the African-Eurasian Migratory Water Birds Agreement (AEWA), the Agreement on Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) and the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat. The proposed MPA network in Lebanon will progress toward becoming part of an integrated coastal zone management perspective, first at national, then at Mediterranean level.

Vision:

"AN EFFECTIVE MARINE PROTECTED AREAS NETWORK CONTRIBUTING TO SUSTAINABLE DEVELOPMENT BY ENHANCING NATURAL AND CULTURAL DIVERSITY".

The current marine protected areas strategy includes three strategic areas as follows:

Strategic Area 1:
Strengthening institutional capacity and MPAs management.

Strategic Area 2:
Contributing through MPAs to resource management and sustainable development.

Strategic Area 3:
Developing scientific research in MPAs.

The following table defines the objectives under each strategic area and the activities needed to achieve each objective.

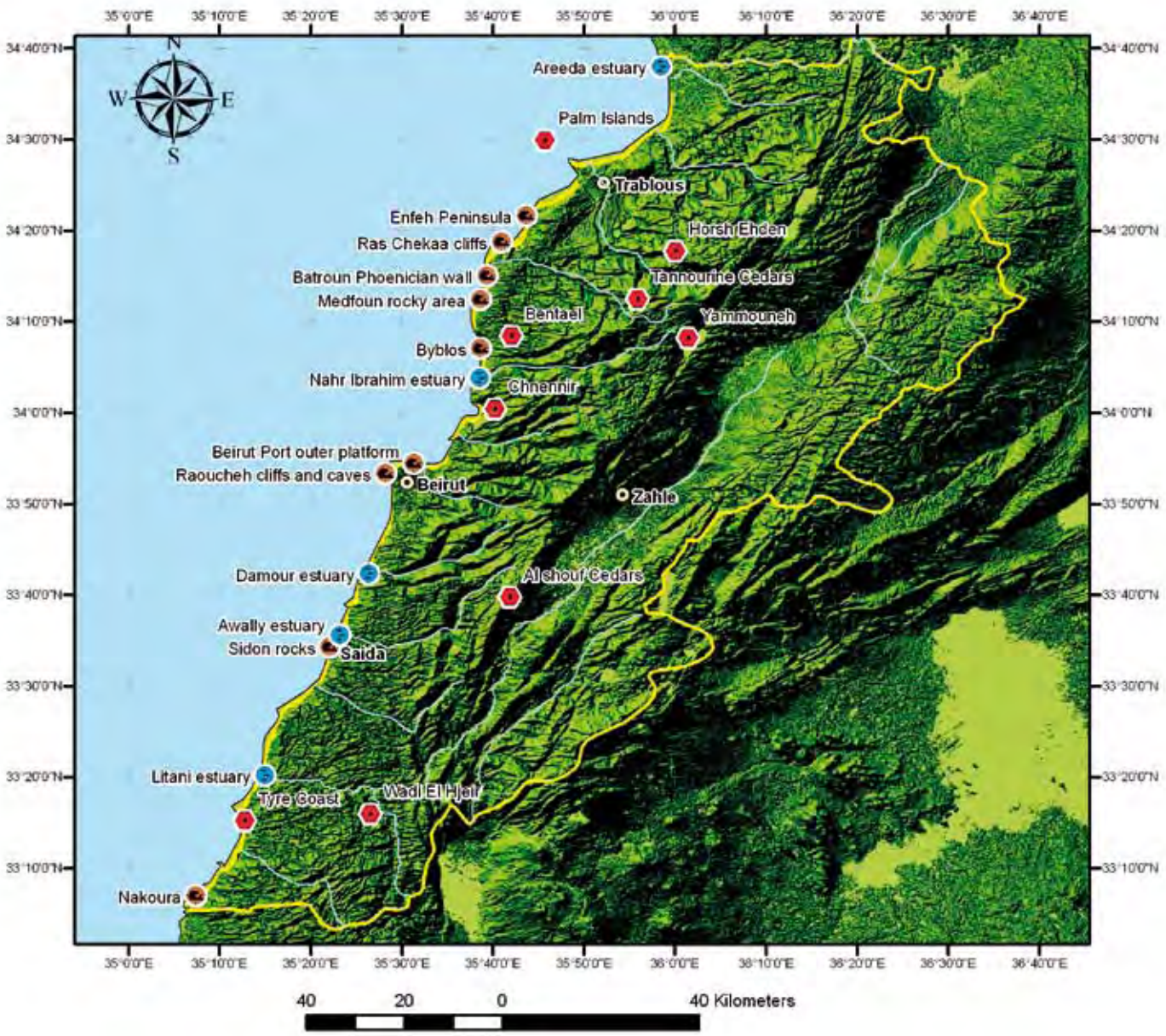
Strategic area 1: Strengthening institutional capacity and MPA management.	
Objectives	**Activities**
Objective 1: Create New MPAs	1. Draft required legal texts for the declaration as MPAs of the already identified, negotiated and studied sites, and initiate administrative procedures for the endorsement of these legal texts.
	2. Identify gaps or missing information of relevance for already declared sites.
	3. Carry out biodiversity field surveys and prepare base maps for the pre-selected priority marine areas for conservation in Lebanon.
	4. Decide which priority areas for conservation should be considered for MPA establishment based on the related field assessment and surveys.
	5. Draft and issue required legal texts for designation of the selected priority areas as new MPAs.
Objective 2: Improve the legislation related to Nature Reserves	6. Follow up the process of endorsement of the General Framework Law on Nature Reserves in Lebanon developed by the MoE and submitted to the Lebanese parliament on April 2012 through decree No. 8045.
	7. Ensure that each MPA has specific legal arrangements and an appropriate national supervisory committee.
	8. Develop a specific law for the Palm Island Nature Reserve separate from Horsh Ehden Nature Reserve (since both reserves were established under the same Law No. 121 dated 9/3/1992.
	9. Encourage ratification, accession and implementation of international instruments related to MPAs and to the environment in general.

Objective 3: Develop and implement management plans for MPAs	10. Update the management plan of existing MPAs.
	11. Endorse the management plans of existing MPAs Council of Ministers decrees.
	12. Provide necessary technical and financial assistance for the proper implementation of the management plans of the existing MPAs.
	13. Draw up management plans for the new MPAs once declared.
	14. Translate the management plans into Arabic for better public dissemination and better local implementation.
	15. Provide MPAs with adequate technical resources for fulfilling their objectives.
	16. Develop and review zoning and boundaries in MPAs using a participatory approach and involve resident populations in supervision.
	17. Ensure that complete information regarding regulations reaches all stakeholders.
Objective 4: A coherent network of MPAs.	18. Set up a national network of MPAs which builds on existing MPAs and newly established MPAs.
	19. Train staff and managers through exchange visits and specially-designed training modules.
Objective 5: Endorse and implement the Revised PA Category System	20. Review and update if needed the proposed national PAs category system in Lebanon which was developed by the MoE based on the IUCN classification system, and follow its endorsement.
	21. Explore the biological significance of current MPAs (PINR & TCNR) and recommend their new classification based on the new category system of PAs.
	22. Define the classification of the new MPAs in the legal text for declaration (Nature reserves, national park, etc.).
Objective 6: Establish and Strengthen the PA Unit at MoE	23. Fill vacant staff positions in the Department of Ecosystems with suitable candidates.
	24. Designate staff to be dedicated to MPAs issues and ensure necessary training for the staff at national and regional level on the protection, sustainable use and management of MPAs.
Objective 7: Establish Committees and Hire Management Teams for the New MPAs	25. Ensure that each MPA has its own local supervisory committee and have it endorsed by the Ministry of Environment in the law of establishment for each MPA.
	26. Review the mandate (responsibilities and obligations) of the Appointed Protected Areas Committees (APAC) which was determined by a letter from the Minister of Environment (Reference number 250/B/2003 dated January 29, 2003) and explore if there is a need to develop a specific mandate for the MPA Committees to adapt it to MPAs needs.
	27. Review the Job description for PAs management teams developed by the MoE and update it if there is a need for specific TORs for the MPAs management teams to adapt it to MPAs' needs.
	28. Initiate necessary administrative steps to endorse the decree concerning the Job description of PAs or MPAs management teams.
	29. Review the policies and procedures for improved management of PAs developed by the MoE and explore the need to update them and to develop specific procedures dedicated to MPAs management to adapt them to MPAs' needs.
	30. Hire a management team for each MPA once created according to the employment mechanism used by the MoE.
	31. Explore alternatives to strengthen and legalize the status of MPAs management teams.
Objective 8: Assess Training Needs of MPA teams and Support Groups	32. Conduct training needs assessment through workshops for MPAs teams and design a capacity-building needs survey to be completed by the nature reserves' committees and management teams.
	33. Prepare a national report on training needs assessment based on the results of the training needs workshops.
	34. Review the National Capacity Building Strategy for key players in the PAs management structure (MoE, APACs and management teams) developed by the MoE and update if when necessary, in particular by adding a section dedicated to MPAs based on the national report on training needs assessment.
Objective 9: Ensure Training Program on MPAs	35. Prepare a yearly training calendar on MPAs based on the national training needs assessment report and the updated national capacity building strategy and ensure necessary financial resources for its implementation.
	36. Organize up to three training sessions per year on MPAs with the help of national experts in marine ecosystems.
	37. Ensure participation from the Protected Areas Unit at the MoE, Committees of the MPAs, management teams of the MoE in the training sessions on MPAs organized by different regional organizations (RAC-SPA, WWF MedPO, MedPan etc…) and national experts if any.
	38. Benefit from the knowledge of the trainers who participated in the training sessions mentioned above to provide training to the different stakeholders in the MPAs in Lebanon
	39. Request support from relevant regional organizations (RAC-SPA, WWF MedPO, MedPan, IUCN etc…) to provide relevant training related to MPAs in Lebanon to the key players in MPA management.
	40. Develop indicators and conduct performance monitoring to assess the effectiveness of the training sessions.
	41. Produce and disseminate training manuals on MPAs.

Objective 10: Organize Exchanges between MPAs at national and regional levels	42. Organize up to three visits per year between existing MPAs and visits between the current MPAs and the new MPAs once established.
	43. Plan and organize up to two visits per year to/from Mediterranean countries (Syria, Turkey, Cyprus, Malta, Greece, etc.).
Objective 11: Delineate and Demarcate MPAs' Boundaries	44. Demarcate existing MPAs.
	45. Conduct a topographic and bathymetric survey of the proposed boundaries of the future MPAs
	46. Delineate the boundaries of the proposed MPAs, determine land ownerships of the coastal part and complete zoning in MPAs.
	47. Study and propose an extension to increase the marine area of the PINR by updating its boundaries (modification of the decree of establishment).
Objective 12: Increase Public Awareness and Education on MPAs	48. Enhance collaboration between the ministries of Environment, Information and Tourism, media and tour operators to promote MPAs.
	49. Produce and update brochures in English and Arabic for existing and new MPAs.
	50. Disseminate the brochures among schools, universities, tourism agencies, ministries, bookstores etc…in addition to international organizations and embassies to spread the materials at international level.
	51. Produce TV spots and documentaries on MPAs.
	52. Sell MPA documentaries in bookstores and video stores.
	53. Screen MPA documentaries internationally (Discovery Channel, National Geographic, Planète, etc.).
	54. Document MPAs success stories and obstacles through field visits and interviews, and disseminate them in national and local media (newspapers, magazines, radio and TV).
	55. Promote MPAs in tourism fairs and exhibitions
	56. Obtain the support of populations, civil society and decision-makers for the MPAs network strategy.
	57. Develop environmental education strategy and implement corresponding activities in every MPA.
	58. Revive the MOU signed in 1995 between the ministries of Environment and Education to include the notion of MPAs in the schools curriculum.
	59. Facilitate organized tours to marine protected areas for schools and assist the creation of environmental clubs in schools.
Objective 13: Put in place funding measures for MPAs.	60. Establish a financial management system for MPAs, striving to increase transparency.
	61. Review the national financial sustainable strategy for PAs developed by MoE that suggests alternative mechanisms for financing PAs management, update it if needed and dedicate a specific part to MPAs to respond to their needs.
	62. Set up indicators and monitoring to ensure the proper implementation of the national financial sustainable strategy for PAs.
	63. Endorse the Program Law prepared by the MoE to execute the NAPPA that was developed by the MoE and integrate the Program Law into the national budget of the GoL, which will ensure the proper budget to implement the activities mentioned in the NAPPA including those related to MPAs.
	64. Mobilize necessary financial resources at national and international levels to implement the actions set in this strategy on the MPA network.
Objective 14: Diversify Sources of Funding for Marine Protected Areas Management	65. Continue to disburse MoE funds to PAs including MPAs in Lebanon on an annual basis and to new MPAs once established.
	66. Audit the MPAs' revenues and expenses annually.
	67. Review and update if needed the database developed by the MoE for available sources of funding for PAs among international sources which includes a list of potential donors, conditions and procedures for applications, and highlight among the donors where relevant those dedicated specifically to MPAs and marine ecosystems.
	68. Disseminate the database of all accessible international and national sources of funding for PAs.
	69. Prepare and distribute annually a report on MPAs contributors.
Objective 15: Update and Monitor Existing Business Plans	70. Hire a business planning/financial expert to assist the management team of TCNR in making best use of its business plan, to be updated when needed.
	71. Prepare a business plan for the PINR.
	72. Prepare business plans for the new MPAs once declared.
Strategic Area II: Contribution through MPAs to resource management and sustainable development	
Objective 1: Promote alternative socio-economic activities in MPAs	73. Determine what facilities are needed in MPAs and ensure the adequate field infrastructure and equipment.
	74. Build visitor facilities and provide necessary maintenance.
	75. Develop standards and incentives for setting up Bed & Breakfasts.
	76. Develop ecotourism in MPAs while reducing its impact (shore and sea).
	77. Assess MPAs' carrying capacity for tourism (development and frequentation) per site.
	78. Identify local eco-guides for each marine protected area.
	79. Train and certify eco-guides for MPAs
	80. Advertise the services of eco-guides through the MoE and MoT.
	81. Promote high quality local handicrafts, especially those which benefit resident communities.

	82. Initiate pilot projects on alternative modes of development, building on success stories and exchanges at regional level.
	83. Minimize the impact of human populations on the environment through a systematic situation analysis, the implementation of appropriate technologies and the adoption of community-based rules.
	84. Promote jobs in MPAs for local communities
	85. Preserve and promote archaeological, historical and cultural features inside MPAs
	86. Encourage traditional industry like handicraft facilities for tourism and provide opportunities for alternative tourism
Objective 2: Establish participatory mechanisms for sustainable local development	87. Define the roles and responsibilities of the stakeholders involved in managing and enhancing the profile of MPAs.
	88. Propose alternative socio-economic and cultural development plans based on local experiences at MPA level.
Objective 3: Enhance the value of MPA fishery resources in a way which encourages their restoration and respects ecological balances, to the benefit of responsible fisheries	89. Establish rules on the sustainable use of fisheries resources in MPAs which give priority to resident communities and have no adverse effect on the regeneration of nationally or regionally important resources.
	90. Promote better value enhancement, processing and marketing of fisheries.
	91. Establish programs to offer financial support for fishermen and their families in cooperation with relevant stakeholders.
	92. Carry out surveys for fishermen, fishing boats and fishing sites and integrate the datas in the evaluation of the carrying capacity within MPAs.
	93. Provide alternative for removal of prohibited fishing tools.
	94. Prohibit fishing activities during breeding or nursing seasons and provide compensation or alternative activities during the relevant period.
Objective 4: Use the MPA network to promote sustainable management of shared resources	95. Promote pilot development activities on a local scale (e.g. aquaculture: encourage fish farming especially for endangered and over exploitation species).
	96. Contribute to the debate on the development of undersea mining in general and of offshore oil drilling in particular.
Strategic Area III: Developing scientific research in MPAs	
Objective 1: Organize information using standardized approaches and methodologies	97. Review MoE databases that were generated through previous field work, surveys and assessments about marine environment and biodiversity in the coastal zone.
	98. List the most significant research conducted to date in relation to marine biodiversity and MPAs.
	99. Identify and collect major multidisciplinary research studies carried out for the Mediterranean coastal zone, and more specifically about the regional network of MPAs.
	100. Use the existing data about the marine environment and MPAs available in the MoE and organise it using a pre-defined classification system (e.g. Database, GIS, etc...) and pre-agreed selection criteria.
	101. Prepare layers maps showing important ecosystems and the distribution of important marine habitats.
	102. Prepare scope for future marine field surveys work based on the analysis of data mentioned above to provide the necessary complement of information.
Objective 2: Develop monitoring and decision-making tools and use them toward sustainable management of MPAs in Lebanon	103. Define an environmental monitoring program for MPAs in Lebanon.
	104. Establish sets of framework indicators to be used as management and decision-making aids, covering the ecological, biological, social, economical and cultural aspects of the MPAs.
	105. Identify MoE and other stakeholder capacity to gather the information related to these indicators and establish the environmental monitoring programme for MPAs
	106. Define and implement a system for collecting, storing and analysing the data collected (database, GIS, etc.)
	107. Prepare monitoring results reports including recommendations concerning habitats management.
	108. Integrate the recommendations into the existing protected areas management system.
Objective 3: Support the emergence of scientists qualified to deal with scientific issues specific to the Lebanon coastal zone using new tools.	109. Develop environmental courses on the marine and coastal environment in relation to marine conservation, coastal issues and protected areas, to be adopted in Universities or Institutes.
	110. Develop environmental awareness programmes on the marine and coastal environment to be used by environmental clubs in schools.
	111. Using the website of the MoE/MPAs, set up an internet forum or discussion groups for scientists and if appropriate the general public.
	112. Develop a method to support marine environment education especially dedicated to postgraduate studies.
	113. Highlight the importance of research on MPAs and marine habitats management and encourage scientists and students to develop research on these topics.
	114. Use national and international experts to carry out biodiversity studies and surveys where needed in the marine environment and MPAs and mobilize funds to locate these studies.

The proposed marine protected area network



3. The proposed Marine Protected Area Network

The following table illustrates the proposed MPA network:

1. Proposed Marine Protected Area sites:	Site 1: **Nakoura**	الناقورة
	Site 2: **Sidon rocks**	صخور صيدون
	Site 3: **Raoucheh cliffs and caves**	الروشة
	Site 4: **Beirut Port outer platform**	حاجز ميناء بيروت
	Site 5: **Byblos**	الجبيل
	Site 6: **Medfoun rocky area**	المدفون
	Site 7: **Batroun Phoenician wall**	البترون
	Site 8: **Ras Chekaa cliffs**	رأس الشقعة
	Site 9: **Enfeh Peninsula**	أنفه
2. Proposed MPA Estuary sites:	Site 10: **Litani Estuary**	مصب نهر الليطاني
	Site 11: **Awally estuary**	مصب نهر الأولي
	Site 12: **Damour estuary**	مصب نهر الدامور
	Site13: **Nahr Ibrahim estuary**	مصب نهر ابراهيم
	Site 14: **Areeda estuary**	مصب نهر العريضة
3. Proposed Deep sea sites: (more than 1000m depth)	The area could be declared an MPA as one unit (site 15) or considering the 4 specific sites (sites 15 to 18) corresponding to the four identified features. The management regulations could be the same in both cases.	

3.1. Proposed Marine Protected Area sites

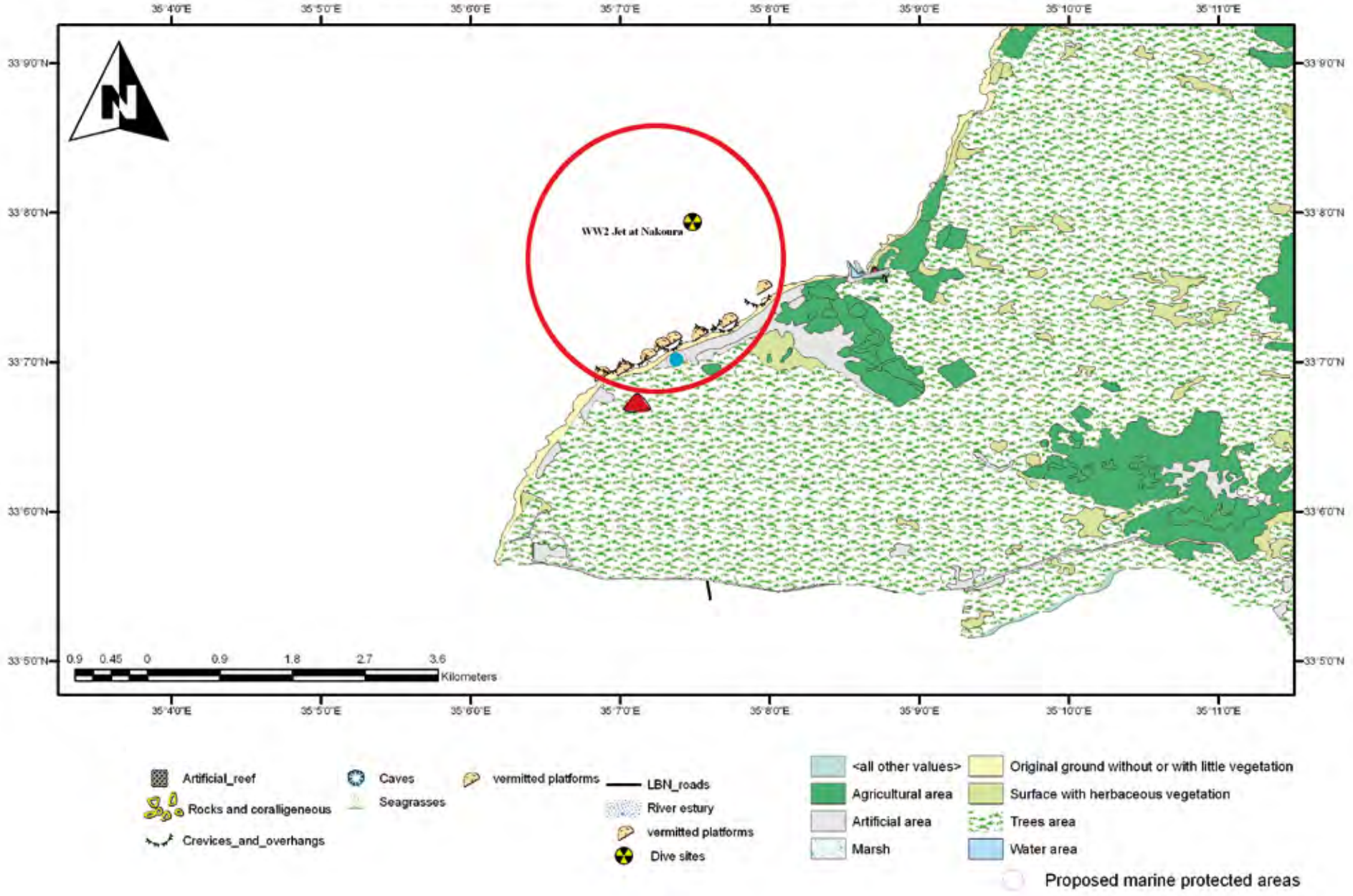
SITE 1: NAKOURA

الناقورة

Location	33° 07' 0.92" 35° 07' 22.48" Located in south Lebanon governorate, on a beautiful sandy and rocky cape. It is about 90 km south of Beirut and 10 km south of the city of Tyre, which was built by the Sidonians.
Quality and importance	The Nakoura site is unique for vermetid platforms of relatively small size; rocks and coralligeneous concretions at shallow depths; crevices and overhangs common; soft bottom areas of small sizes occasionally present in patches. The site provides nurseries, spawning and feeding grounds.
Vulnerability	The area under threat from fishing, traditional agriculture, sewage/ industrial runoffs.
Conservation status	To be defined.
Habitat types	The proposed area consists of limestone cliffs with hard underwater bottoms and occasional soft bottom patches.
Criteria applicable	Importance of threatened species and habitats, fragile habitats, low recovery.

Nakoura Beach. © Ziad Samaha.

Nakoura proposed marine protected area



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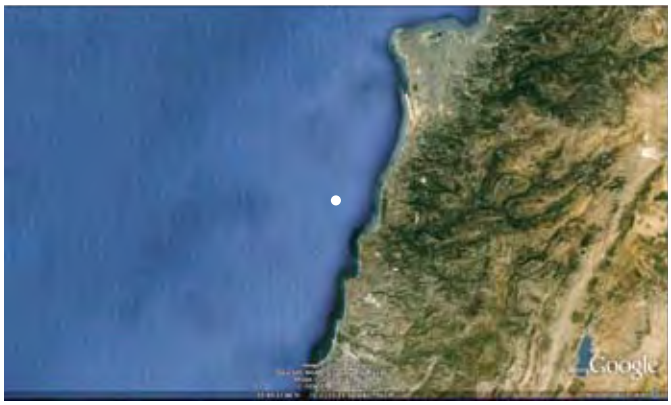
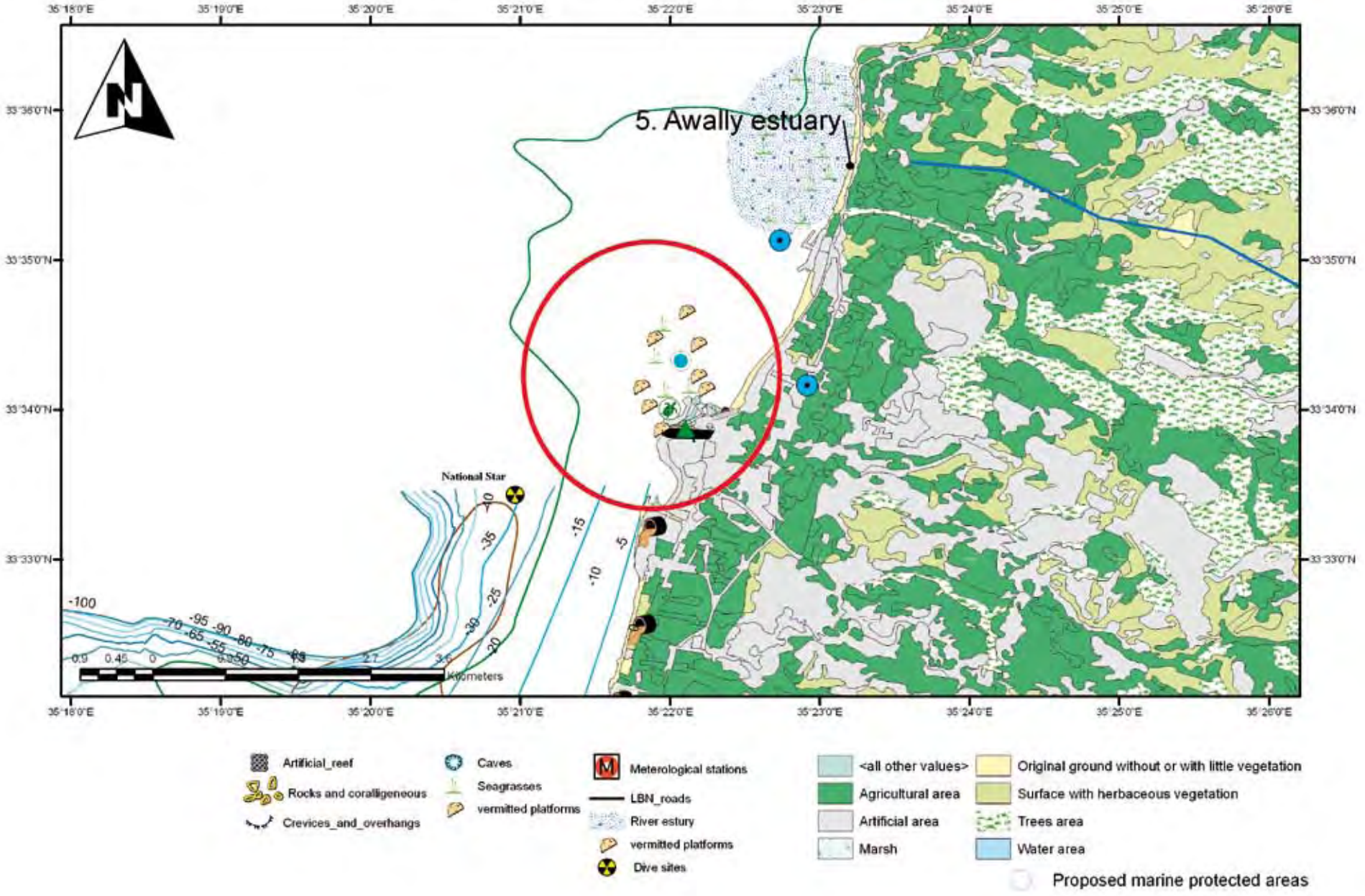
SITE 2: SIDON ROCKS

صخور صيدون

Location	33° 44' 19.67" 35° 22' 4.32" Sidon Rocks is located in the marine waters of the city of Saida, located in the governorate of South Lebanon.
Quality and importance	Islets of rocks and vermetid reefs in the vicinity of Saida. A beach composed of gravel found nearby as well as the estuary of the Awally River. Hard bottom in shallow areas and surrounded by a sandy soft bottom. Saida (Sidon) includes an archaeological and historic features site that was nominated (1984) as a UNESCO World Heritage Site. Very low biodiversity, dominated by introduced species.
Vulnerability	Pressure on vermetid platforms, fishing activities, harvesting activities, spear-fishing, blast fishing (capsoon), agricultural runoffs, sewage/industrial runoffs, eutrophication and recreational activities.
Conservation status	Isolated island, UNESCO site.
Habitat types	Vermetid platforms of small to moderate size; rocks and coralligeneous concretions at shallow depth; large surrounding soft bottom area constituted mainly of sand and silt; vestige of a seagrass meadow.
Criteria applicable	Nurseries, feeding grounds, habitat for soft bottom communities, habitat for seagrass meadow communities.



Sidon jzeereh proposed marine protected area



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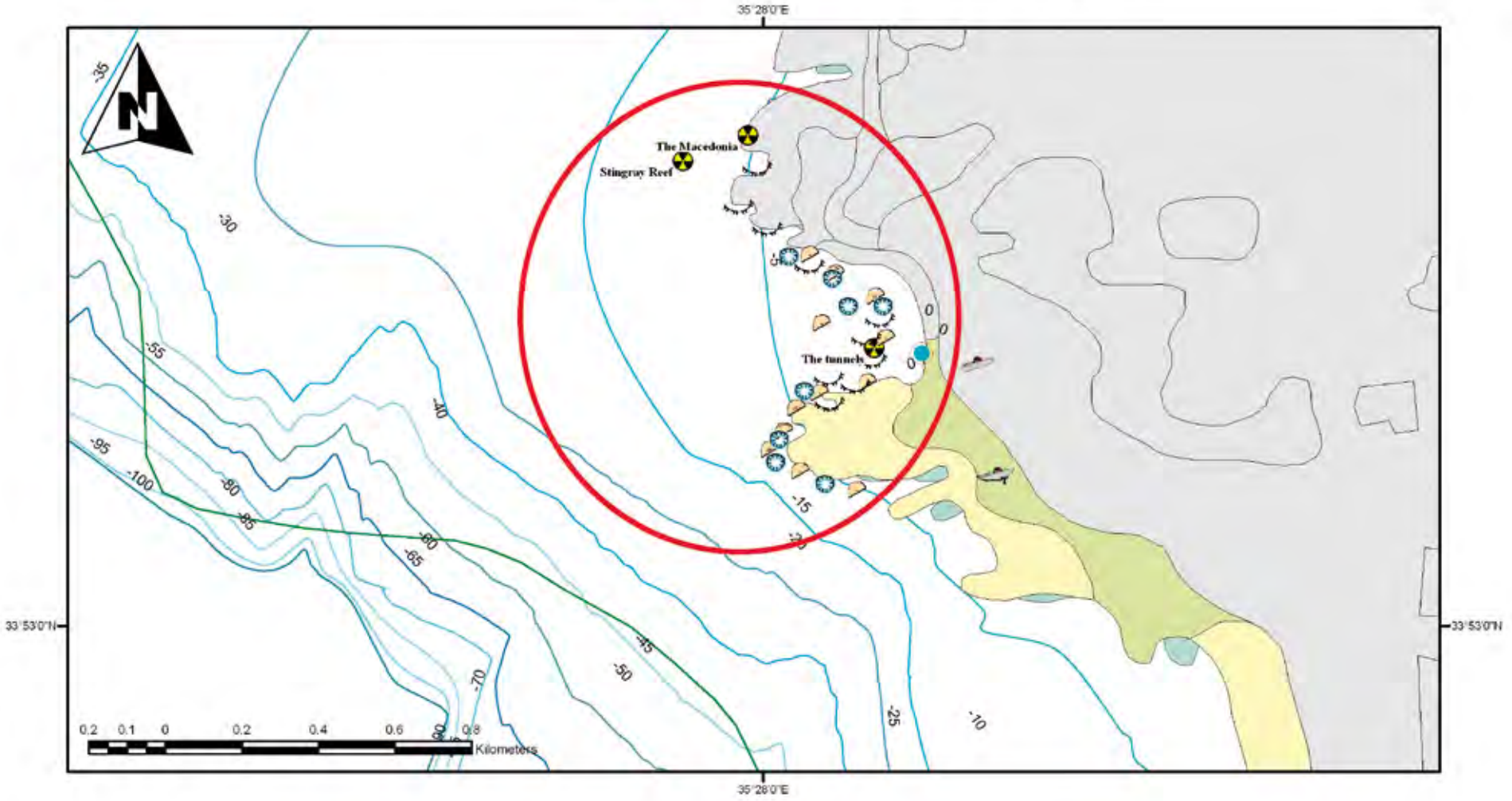
SITE 3: RAOUCHEH CLIFFS AND CAVES

الروشة

Location	33° 53' 32.04" 35° 28' 13.38" Located at Beirut's western-most tip in the governorate of Beirut.
Quality and importance	Beautiful limestone cliffs area with two large standing rock formations (Pigeons' Rocks). Shallow hard underwater bottoms extending over most of the area. Soft bottoms found at greater depths. Archaeological and historic site and a popular tourist destination (scale bar 250m).
Vulnerability	Pressure on vermetid platforms, fishing activities, harvesting activities, spear fishing, blast fishing (capsoon), agricultural runoffs, sewage/industrial runoffs, eutrophication and coastal development.
Conservation status	To be defined. The area is one of the most touristic sites in Lebanon.
Habitat types	Vermetid platforms of moderate size; rocks and coralligeneous concretions at shallow depth; caves (underwater or at surface), crevices and overhangs common; soft bottom area in deeper water.
Criteria applicable	Nurseries, spawning grounds, feeding grounds, habitat for hard bottom communities, habitat for soft bottom communities.

Raoucheh proposed marine protected area



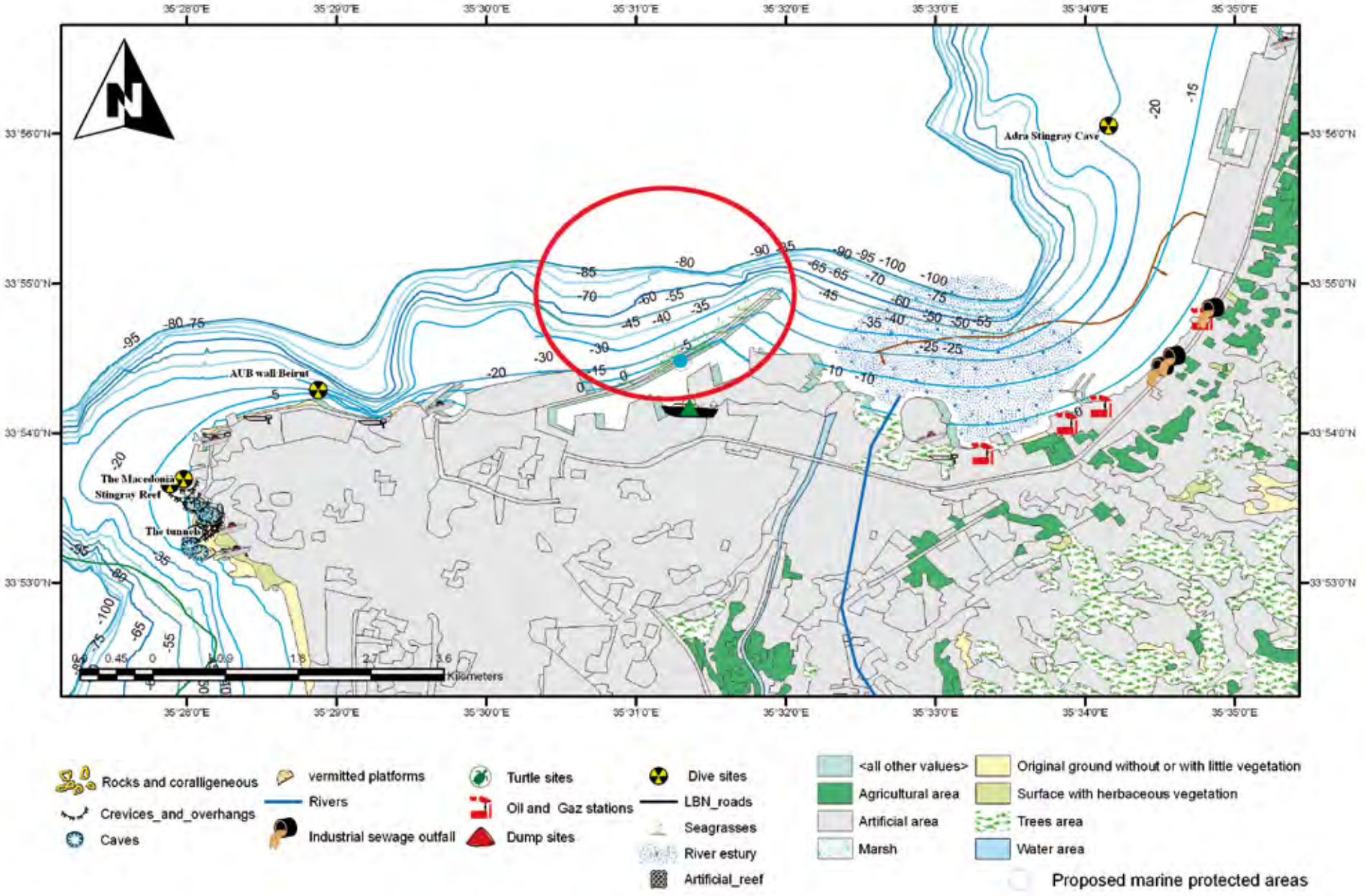
© Ministry of Tourism in Lebanon

SITE 4: BEIRUT PORT OUTER PLATFORM

حاجز ميناء بيروت

Location	33°54'29.07" 35°31'17.82" Located in Beirut city, in the governorate of Beirut.
Quality and importance	Artificial site composed of a long jetty (>2km) that protects the port of Beirut. Concrete structures as well as rocks and boulders of various sizes create artificial caves and crevices which act as an artificial reef.
Vulnerability	Fishing activities, harvesting activities, spear fishing, blast fishing (capsoon), agricultural runoffs, sewage/industrial runoffs, eutrophication and important maritime traffic.
Conservation status	To be defined.
Habitat types	Artificial reef at shallow depth; soft bottom area; vestige of a seagrass meadow.
Criteria applicable	Nurseries, spawning grounds, feeding grounds, habitat for hard bottom communities, habitat for soft bottom communities.

Beirut port outer platform proposed marine protected area



SITE 5: BYBLOS

الجبيل

Location	34º 07' 18.00" 35º 38' 38.35" This site is located in the city of Byblos. Governorate of North Lebanon. 40 km of Beirut.
Quality and importance	Large vermetid reefs with significant ponds. A beach composed of gravel is found north of the area and the Byblos historic port lies to the south. Hard bottom found in shallow areas and soft bottom with a seagrass meadow dominates deeper waters. Archaeological and historic features.
Vulnerability	Pressure on vermetid platforms, fishing activities, harvesting activities, spear fishing, blast fishing (capsoon), traditional agricultural runoffs, sewage/industrial runoffs, eutrophication.
Conservation status	Jbail (Byblos) is a UNESCO World Heritage Site (cultural, III, IV & VI).
Habitat types	Vermetid platforms of relatively large size; rocks and coralligenous concretions at shallow depth; soft bottom areas with large seagrass meadow in deeper water.
Criteria applicable	Nurseries, spawning grounds, feeding grounds, habitat for hard bottom communities, habitat for soft bottom communities, habitat for seagrass meadow communities.

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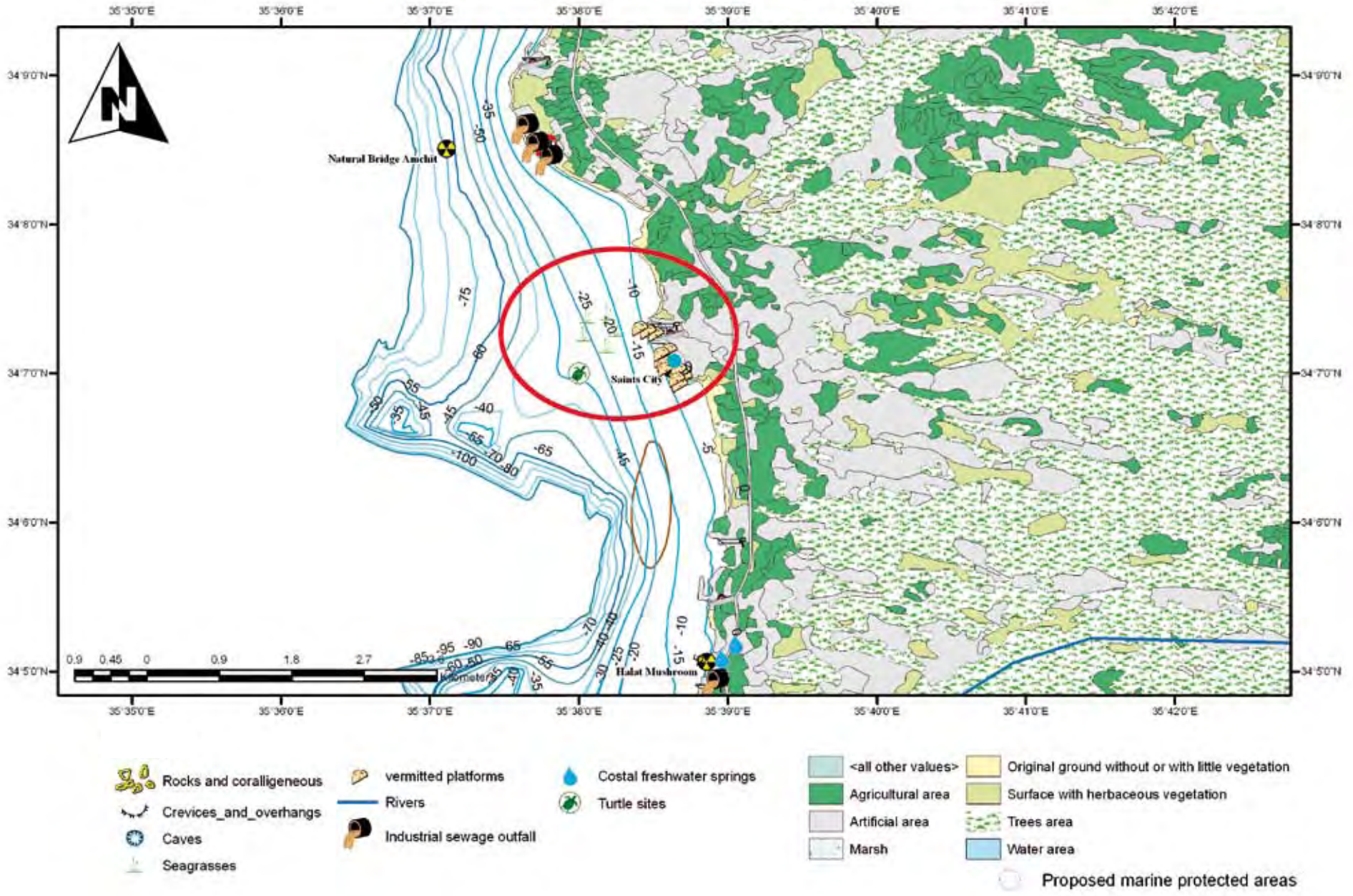
Byblos proposed marine protected area



SITE 6: MEDFOUN ROCKY AREA

المدفون

Location	34º 12' 29.49" 35º 38' 37.89" Located in North Lebanon Governorate, 50 km from Beirut.
Quality and importance	Rocky area with moderate cliffs. Hard underwater bottoms with occasional soft bottom patches. This area could be considered as partly protected since it lies within a military area
Vulnerability	Pressure on vermetid platforms; fishing activities, harvesting activities, spearfishing, blast fishing (capsoon), traditional agricultural runoffs, sewage/industrial runoffs.
Conservation status	To be defined.
Habitat types	Vermetid reefs and pools of moderate size close to the surface; rocks and coraligenous concretions at greater depths; crevices and overhangs common, and occasional soft bottom patches present.
Criteria applicable	Nurseries, spawning grounds, feeding grounds, habitat for hard bottom communities, habitat for soft bottom communities.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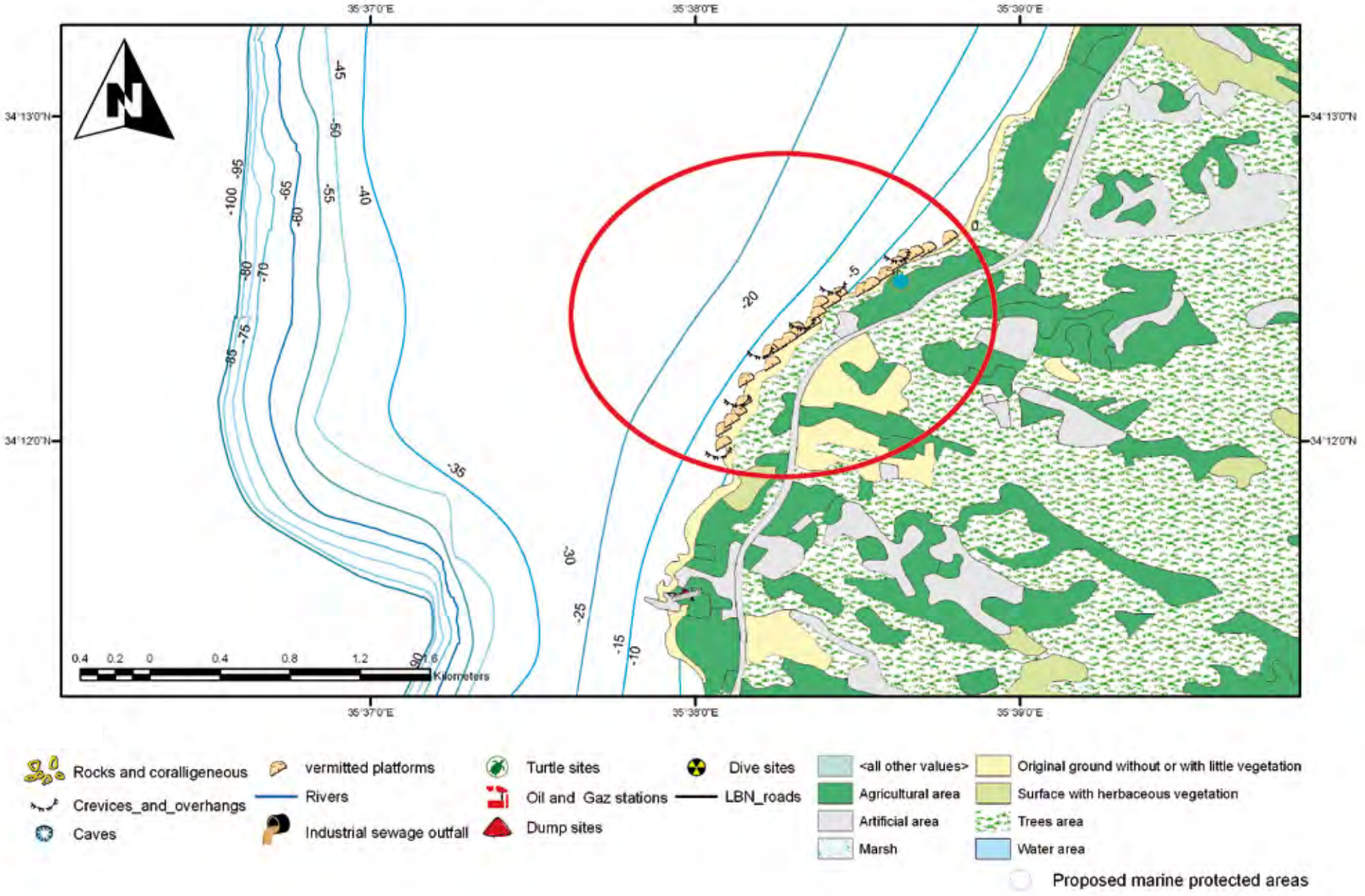
Medfoun proposed marine protected area



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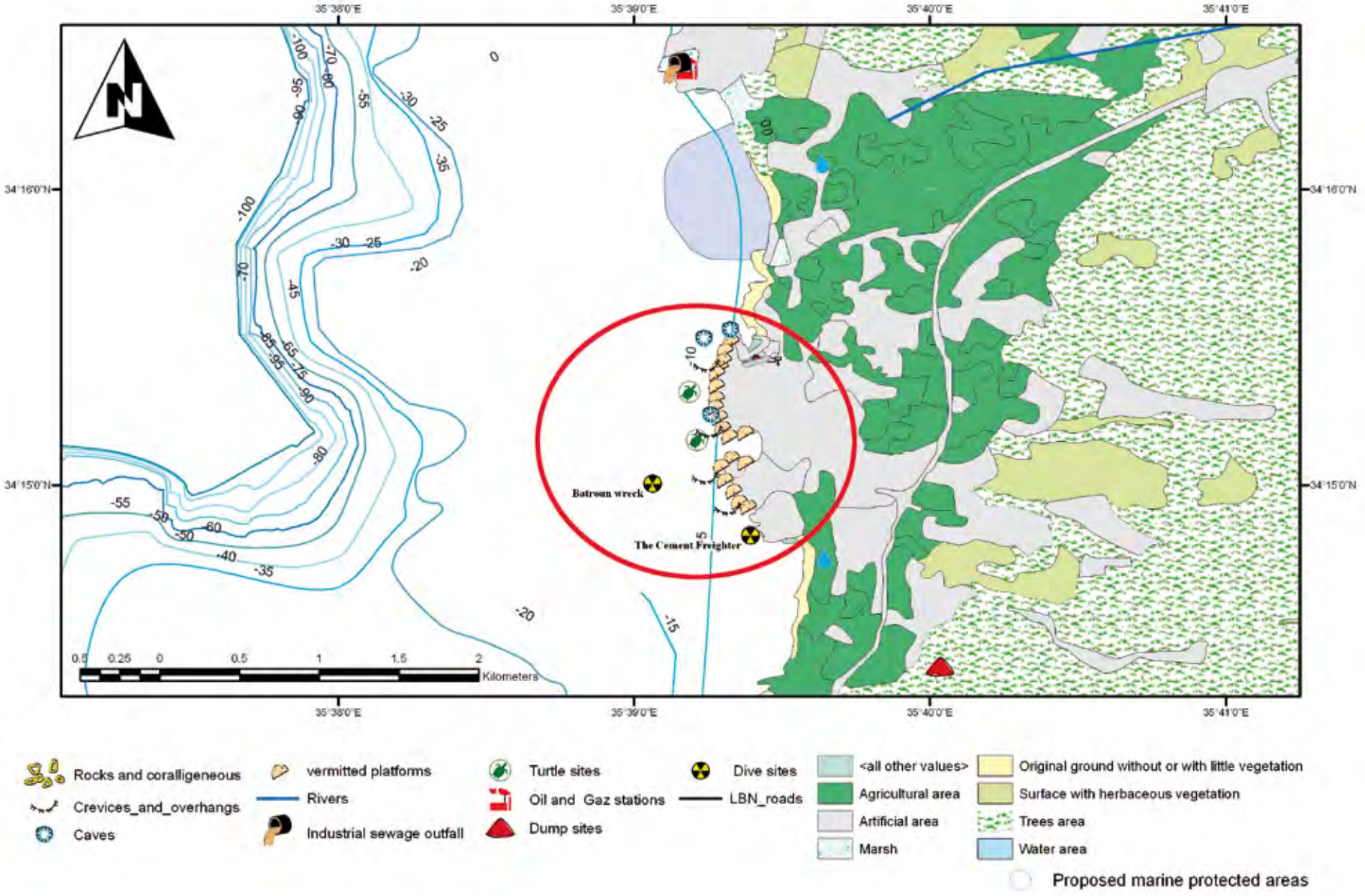
SITE 7: BATROUN PHOENICIAN WALL

البترون

Location	34º 15' 3.54" 35º 39' 20.45" Located in the Governorate of North Lebanon, 55 km from Beirut
Quality and importance	Rocky area with important vermetid reefs and hard underwater bottoms. Shallow hard underwater bottoms extend over most of the area. Soft bottoms found at greater depths. Archaeological and historic site and a popular tourist destination. A historic wall is believed to have been erected by the Phoenicians for protection from waves.
Vulnerability	Pressure on vermetid platforms, fishing activities, harvesting activities, spear fishing, blast fishing (capsoon), traditional agricultural runoffs, sewage/industrial runoffs.
Conservation status	To be defined.
Habitat types	Vermetid platforms of moderate size; rock and coraligeneous concretions at shallow depth with boulders, crevices and overhangs. Soft bottom areas of small sizes occasionally present in patches below 15-20 m depth.
Criteria applicable	Nurseries, spawning grounds, feeding grounds, habitat for hard bottom communities, habitat for soft bottom communities, habitat for seagrass meadow communities.

Batroun proposed marine protected area



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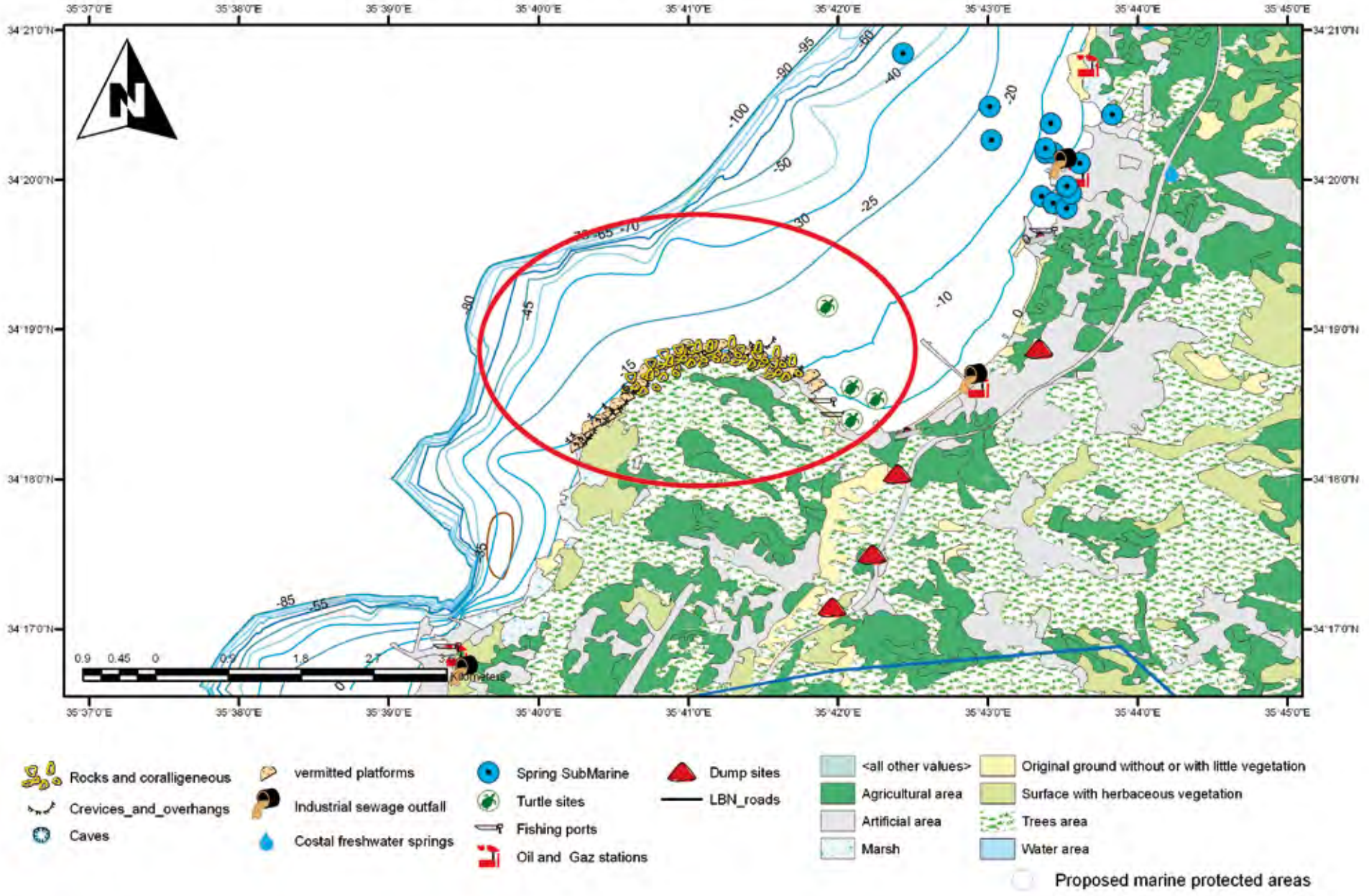
SITE 8: RAS CHEKAA CLIFFS

رأس الشقعة

Location	34º 18' 47.56" 35º 40' 58.03" Located in North Lebanon Governorate, 60 km from Beirut.
Quality and importance	Limestone cliffs area with hard underwater bottoms and caves. Landscape and seascape with cultural and religious importance.
Vulnerability	Pressure on vermetid platforms, fishing activities, harvesting activities, spearfishing, blast fishing (capsoon), agricultural runoffs, sewage/industrial runoffs.
Conservation status	Ramsar site.
Habitat types	Vermetid platforms of relatively moderate size; rocks and coralligenous concretions at shallow depth; caves (underwater or at surface), crevices and overhangs common; a few soft bottom areas of small sizes occasionally present. The caves are characterized by the diversity of sponges and associated species.
Criteria applicable	Nurseries, spawning grounds, feeding grounds, habitat for hard bottom communities, habitat for soft bottom communities.

Ras Chekaa proposed marine protected area



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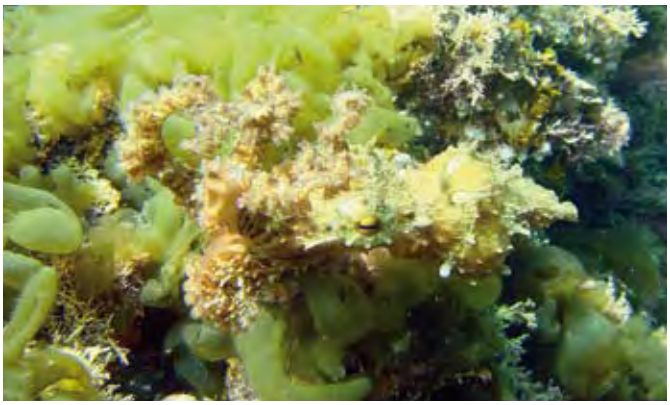
SITE 9: ENFEH PENINSULA

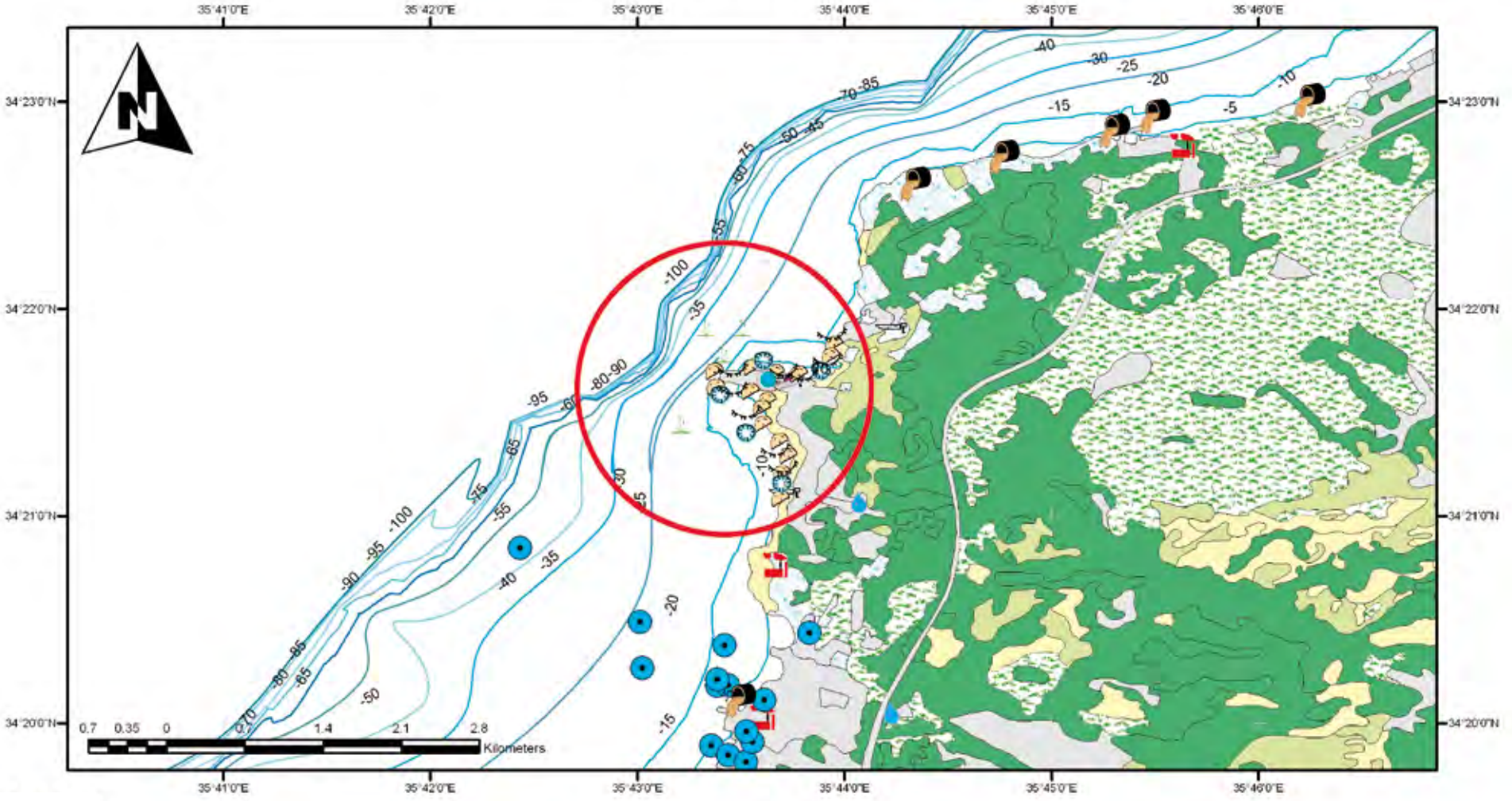
أنفه

Location	34º 21' 39.54" 35º 43' 37.93" Located in the North Lebanon Governorate. 63 km from Beirut.
Quality and importance	Limestone rocks and vermetid reefs forming a peninsula. Shallow hard underwater bottoms; soft bottom in deeper waters. Archaeological and historical site.
Vulnerability	Pressure on vermetid platforms, fishing activities, harvesting activities, spearfishing, blast fishing (capsoon), agricultural runoffs, sewage/industrial runoffs, eutrophication.
Conservation status	To be defined.
Habitat types	Vermetid platforms of relatively moderate size; rocks and coralligenous concretions at shallow depth; crevices and overhangs common; soft bottom areas of small sizes are occasionally present in patches.
Criteria applicable	Nurseries, spawning grounds, feeding grounds, habitat for hard bottom communities, habitat for soft bottom communities

Octopus at enfeh. © Marcos.

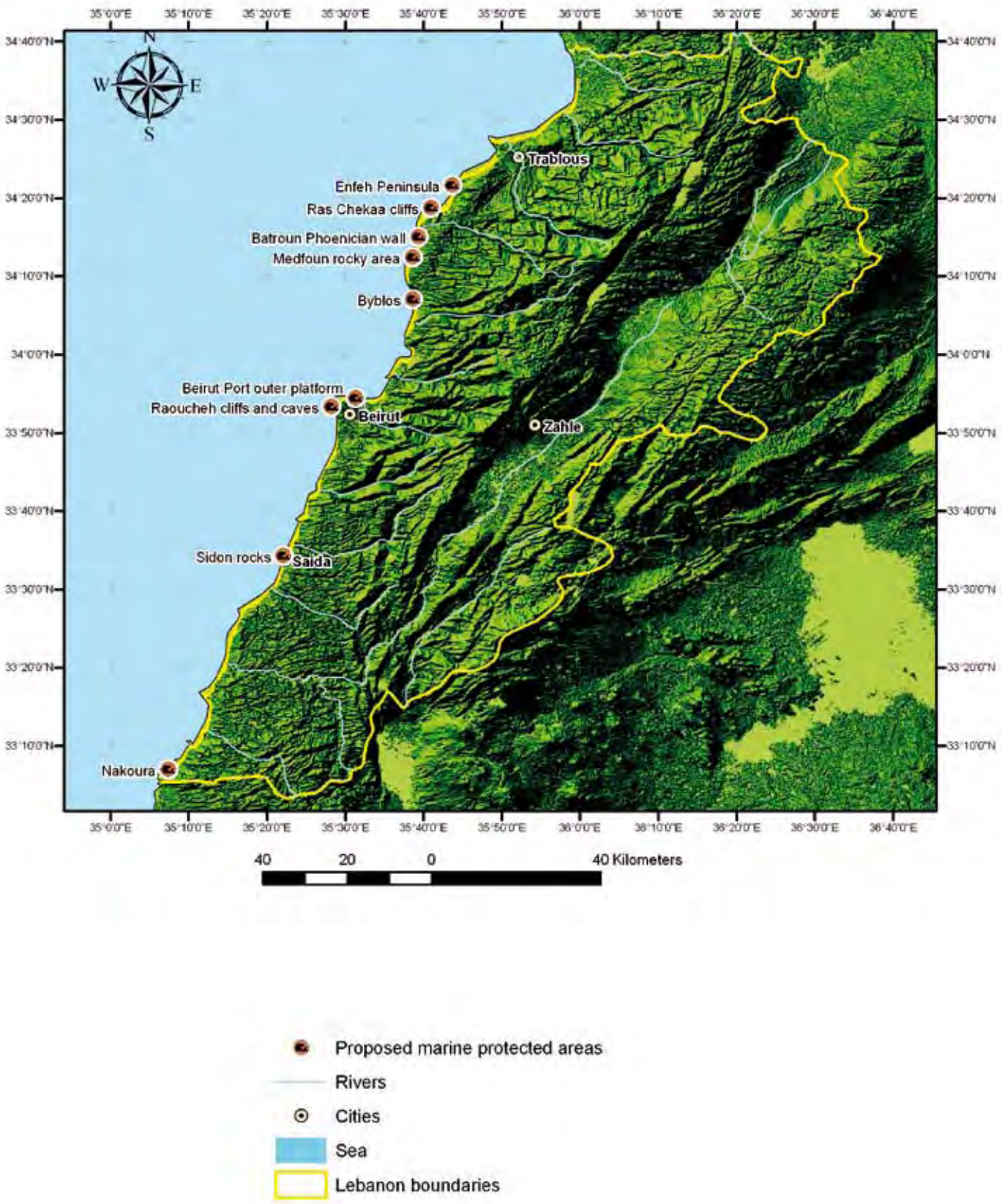


Enfeh proposed marine protected area

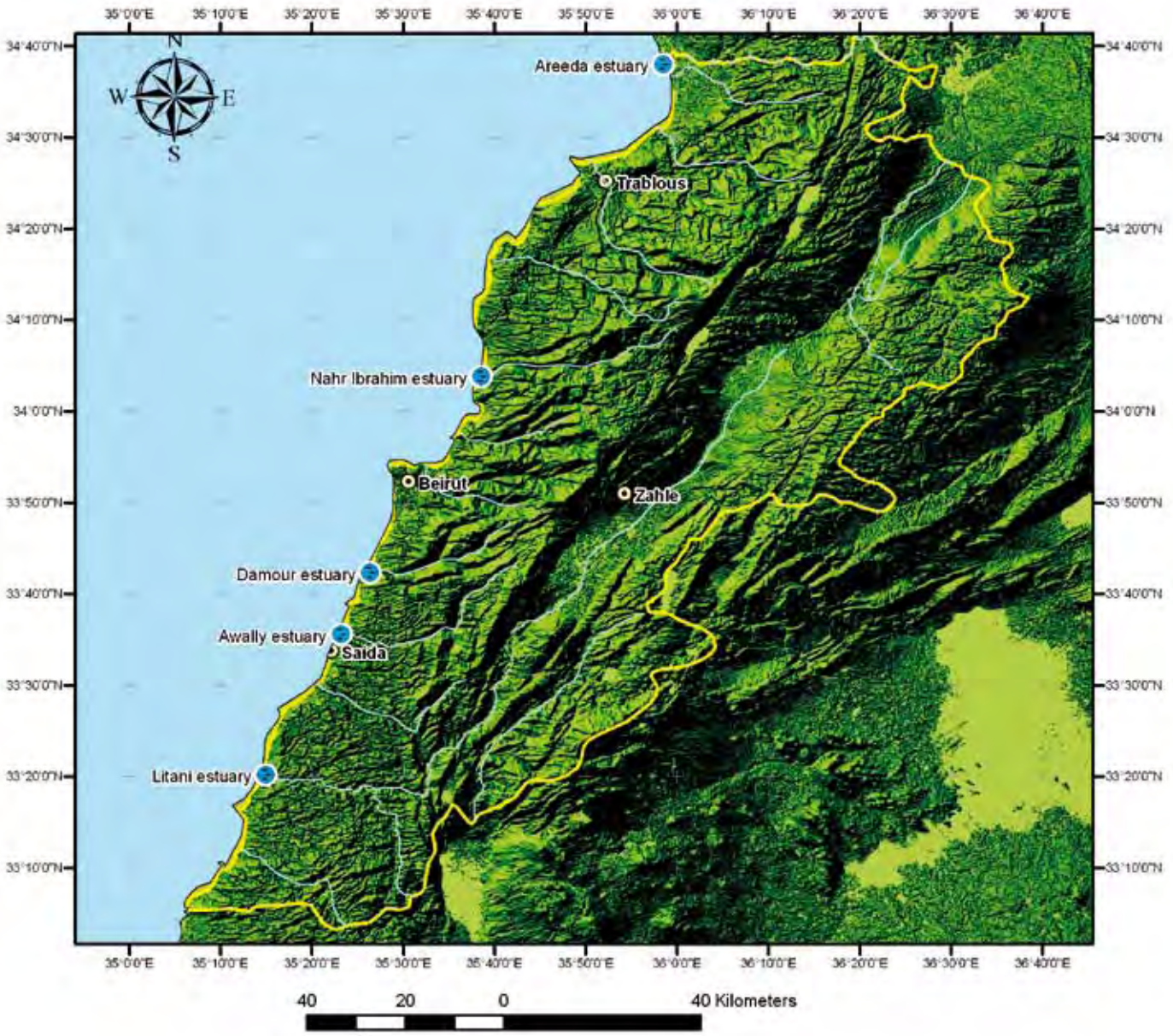


Rocks and coralligeneous
Crevices_and_overhangs
Caves
Seagrasses
vermitted platforms
Industrial sewage outfall
Costal freshwater springs
Spring SubMarine
Oil and Gaz stations
<all other values>
Agricultural area
Artificial area
Marsh
Original ground without or with little vegetation
Surface with herbaceous vegetation
Trees area
Water area
Proposed marine protected areas

The proposed marine protected area sites



The proposed marine protected area estuary sites



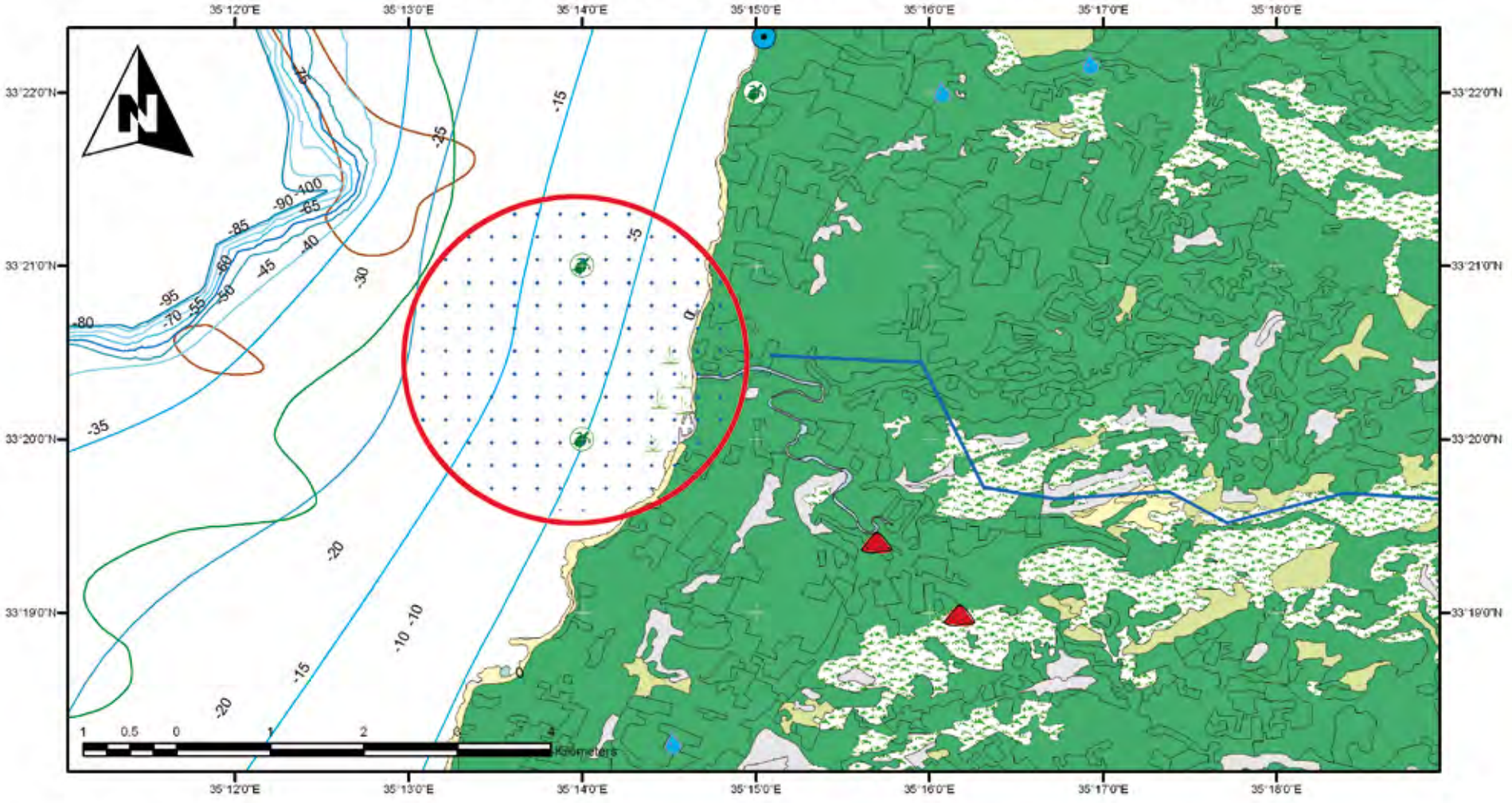
3.2. Proposed Marine Protected Area estuary sites

SITE 10: LITANI ESTUARY

مصب نهر الليطانى

Location	33° 20' 19.28" 35° 14' 42.05" Located in South Lebanon Governorate. The river rises in the fertile Beqaa Valley, west of Baalbek, and empties into the Mediterranean Sea north of Tyre.
Quality and importance 	The Litani River is an important water resource in southern Lebanon. Exceeding 140 km in length, it is the longest river in Lebanon and provides an average annual flow estimated at 920 million cubic meters. The waters of the Litani both originate and flow entirely within the borders of Lebanon. The site is important for fisheries, and in relation to the presence of marine turtles and seagrass meadows. The habitat, a combination of physical features and living organisms that provide food, nesting, resting and shelter for fish and wildlife, has recently experienced significant changes in benthic community structure, possibly as a result of anthropogenic activity. The potential of the site for restoration is therefore apparent. Being a distinct topographic entity, identification of the Litani estuary as a protected area with defined boundaries is relatively straightforward.
Vulnerability	The Litani estuary river has been targeted by fishing activities for many years, and chemical pollution is important due to agricultural, urban and industrial sewage.
Conservation status	Status to be defined. According to Lebanese law (Act no. 1/385, issued January 26, 1997), fishing activities are prohibited in all estuaries all year round.
Habitat types	Coastal wetlands (estuaries), sandy beaches and marine vegetation beds.
Criteria applicable	Importance of threatened species and habitats, fragile habitats, low recovery.

Litani estuary proposed marine protected area



Proposed marine protected areas

Seagrasses
Rivers
Costal freshwater springs
Spring SubMarine
Turtle sites
River estury

<all other values>
Agricultural area
Artificial area
Marsh
Original ground without or with little vegetation
Surface with herbaceous vegetation
Trees area
Water area

SITE 11: AWALLY ESTUARY

مصب نهر الأولي

Location	33° 35' 18.90" 35° 23' 8.58" The Awali is a perennial river flowing in South Lebanon Governorate.
Quality and importance 	The Awali is a perennial river flowing in Southern Lebanon. It is 48 kilometres (30 mi) long, originating from the Barouk mountain at a height of 1,492 metres (4,895 ft) and the Niha mountain. The Awali is supplemented by two tributaries, the Barouk and Aaray rivers. The Awali is also known as the Bisri river in its upper section; it flows through the western face of Mount Lebanon and into the Mediterranean. The Awali river has a discharge of 10.1625 m^3/s (358.89 cu ft/s), it forms a watershed with an area of about 294 km^2 (114 sq mi). The Awally river estuary is important in terms of fisheries and seagrass meadows. Habitat is a combination of physical features and living organisms that provide food, nesting and resting areas, and shelter for fish and wildlife.
Vulnerability	The Awally river estuary has been targeted by fishing activities, and chemical pollution resulting from agricultural, urban and industrial sewage.
Conservation status	MPA status to be determined. According to the decision of the Ministry of Agriculture no. 385/1 dated January 26, 1997, fishing activities are prohibited in all estuaries all year round.
Habitat types	Coastal wetlands (estuaries), sandy beaches and marine vegetation beds.
Criteria applicable	Importance of threatened species and habitats, fragile habitats, low recovery.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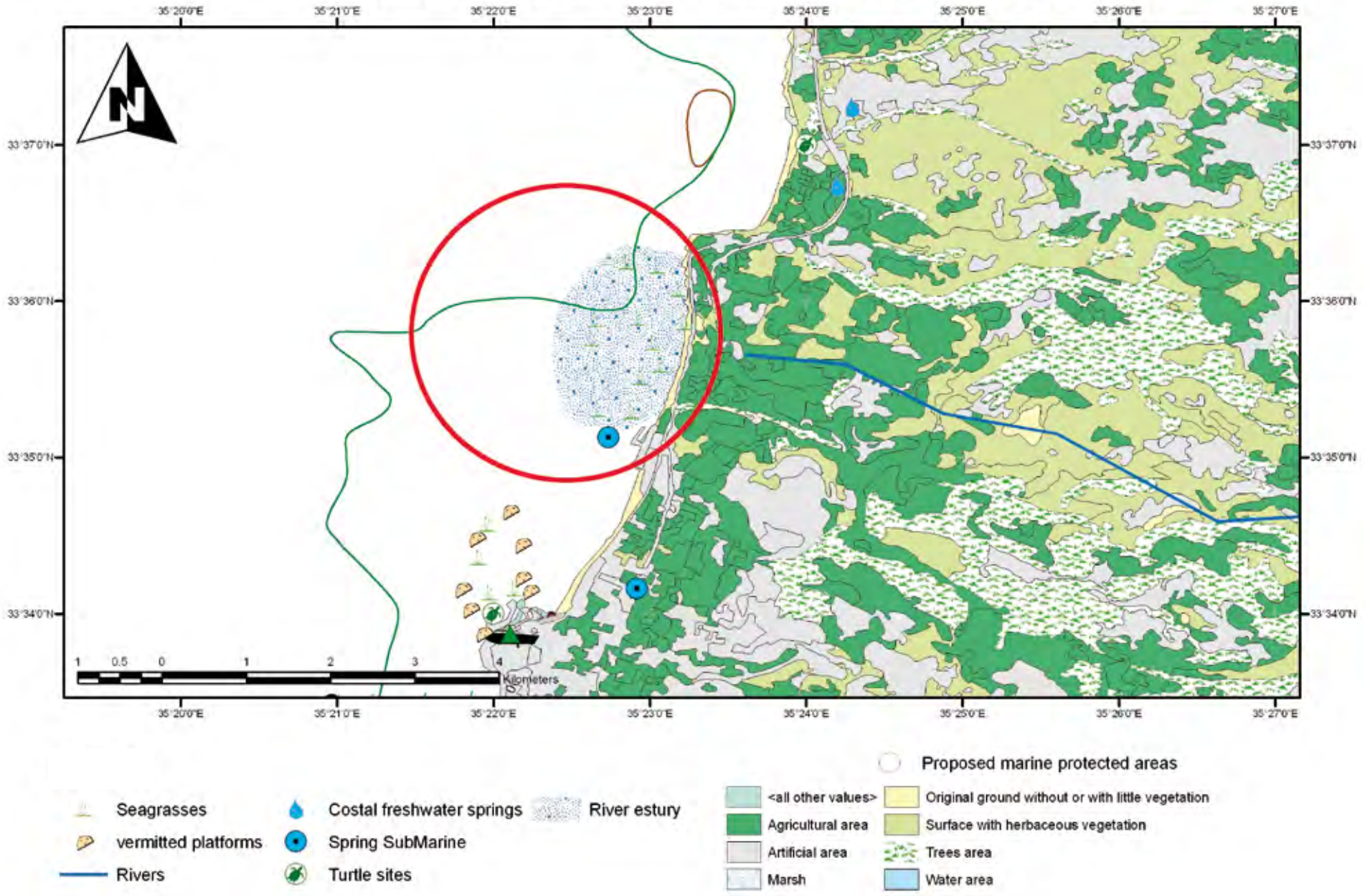
Awaly estuary proposed marine proteced area



SITE 12: DAMOUR ESTUARY

مصب نهر الدامور

Location	33° 42' 20.82" 35° 26' 23.15" Located in South Lebanon Governorate, in Damour city which is situated at 24 km south of Beirut.
Quality and importance	The site is characterised by a sandy bottom area with seagrass meadow in patches. The estuary is a nursery, spawning and feeding ground for numerous species. The green turtle (Chelonian mydas) has been recorded in this site.
Vulnerability	An area targeted by fishing activities, agriculture activities, sewage/industrial runoffs.
Conservation status	MPA status to be determined. According to the decision of the Ministry of Agriculture no. 385/1 dated January 26, 1997, fishing activities are prohibited in all estuaries all year round.
Habitat types	Coastal wetlands (estuaries), sandy beaches and marine vegetation beds.
Criteria applicable	Importance of threatened species and habitats, fragile habitats, low recovery.

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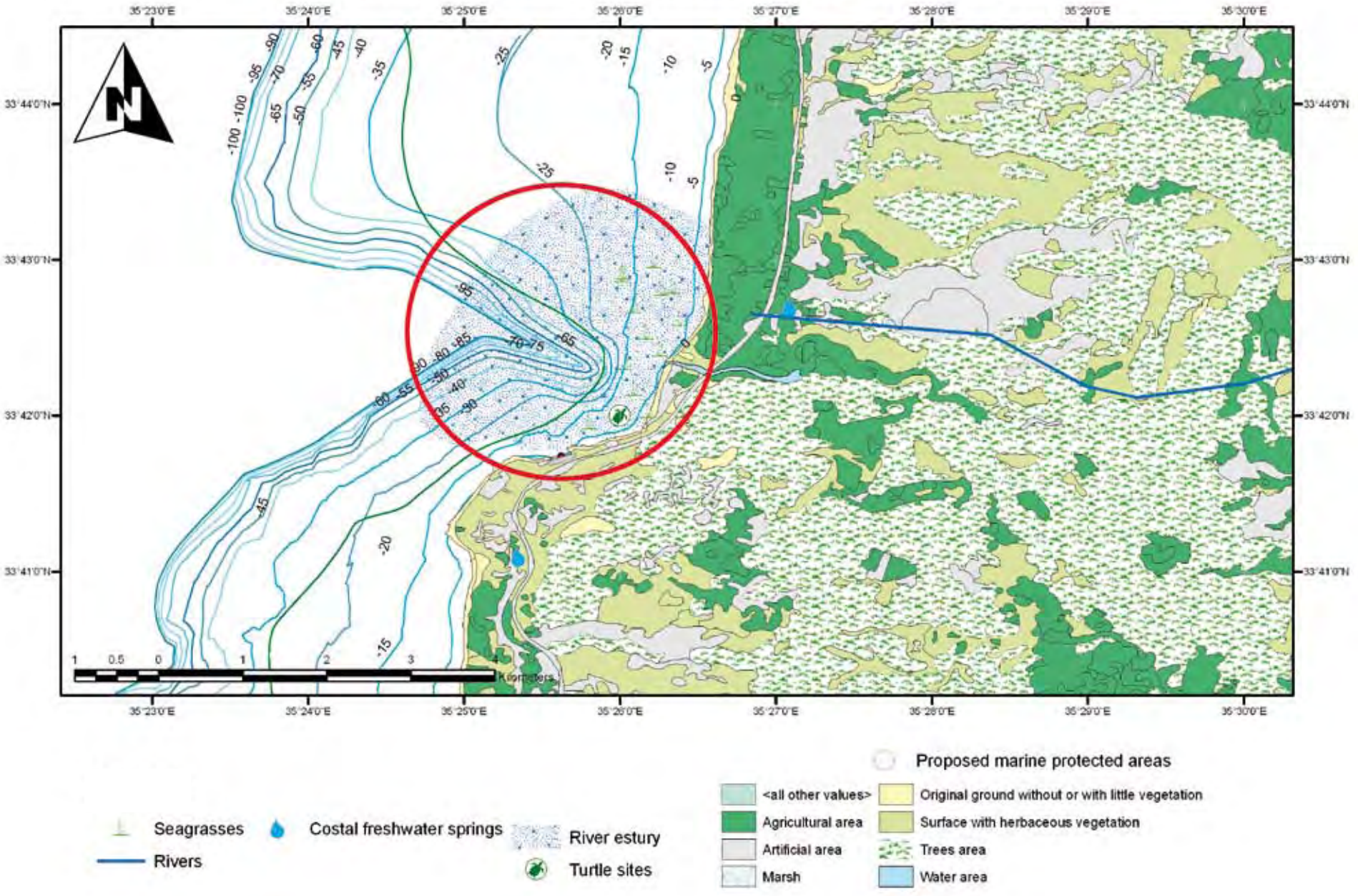
Damour estuary proposed marine proteced area



SITE 13: NAHR IBRAHIM ESTUARY

مصب نهر ابراهيم

Location	34° 03' 49.95" 35° 38' 33.67" Ibrahim River is a small river in the Mount Lebanon Governorate in Lebanon. It passes through the town of Nahr Ibrahim before emptying into the Mediterranean Sea. The town takes its name from the river. Today, it is one of the tourist attractions areas in Lebanon.
Quality and importance	The site is characterised by a sandy bottom area with seagrass meadow in patches. The estuary is a nursery, spawning and feeding ground for numerous species. The green turtle *(Chelonia mydas)* has been recorded here.
Vulnerability	The area is targeted by fishing activities, agriculture activities, sewage/industrial runoffs.
Conservation status	MPA status to be determined. According to the decision of the Ministry of Agriculture no. 385/1 dated January 26, 1997, fishing activities are prohibited in all estuaries all year round.
Habitat types	Coastal wetlands (estuaries), sandy beaches and marine vegetation beds.
Criteria applicable	Importance of threatened species and habitats, fragile habitats, low recovery.

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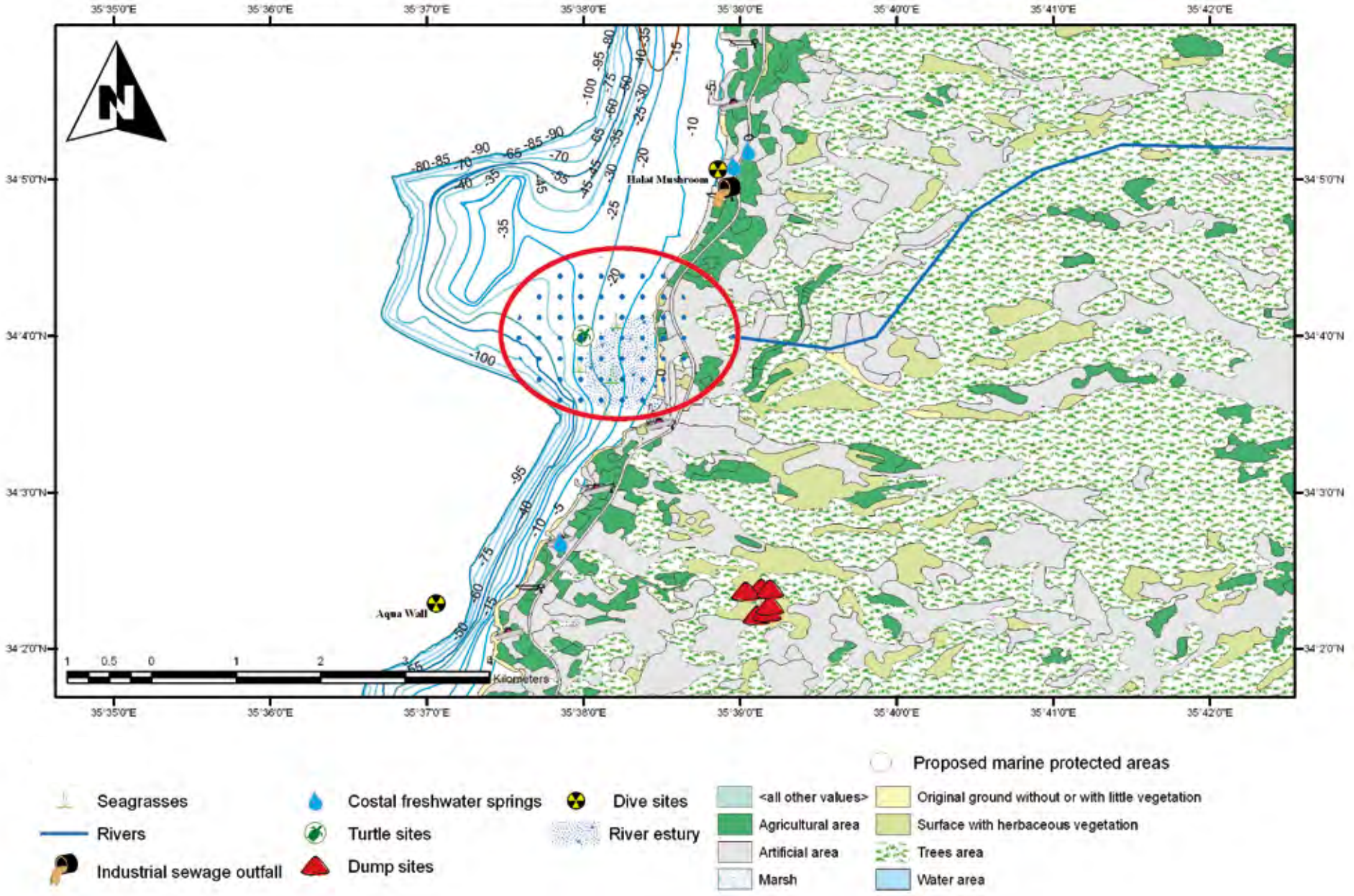
Nahr Ibrahim estuary proposed marine proteced area

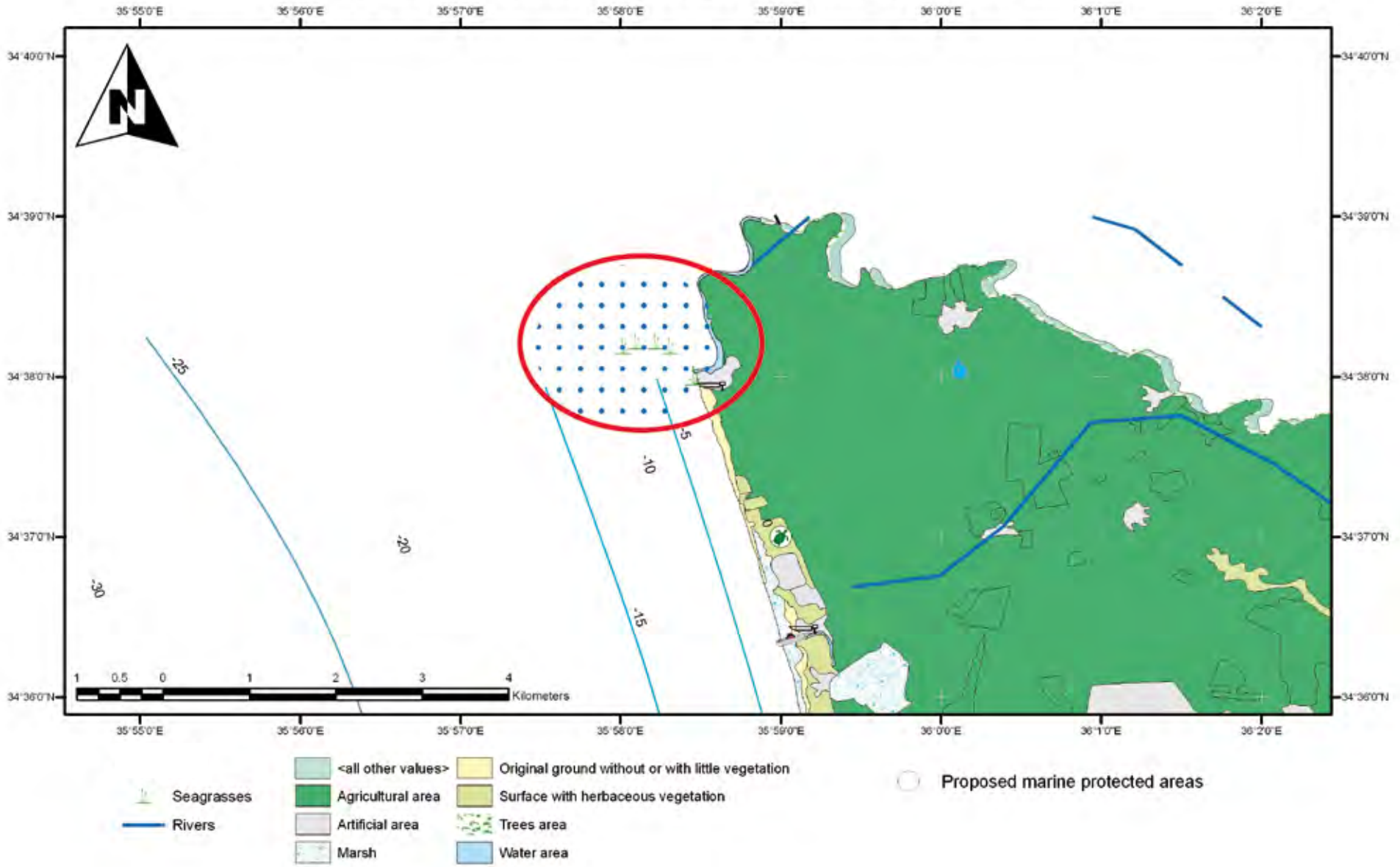


SITE 14: AREEDA ESTUARY

مصب نهر العريضة

Location	34° 37' 59.70" 35° 58' 34.20" The Areeda River is located in north Lebanon near the boundary between Lebanon and Syria.
Quality and importance	The site is characterised by a sandy bottom area with seagrass meadow in patches. The estuary is a nursery, spawning and feeding ground for numerous species. The green turtle (Chelonia mydas) has been recorded here.
Vulnerability	The area is targeted by fishing activities, agriculture activities, sewage/industrial runoffs.
Conservation status	MPA status to be determined. According to the decision of the Ministry of Agriculture no. 385/1 dated January 26, 1997, fishing activities are prohibited in all estuaries all year round.
Habitat types	Coastal wetlands (estuaries), sandy beaches and marine vegetation beds.
Criteria applicable	Importance of threatened species and habitats, fragile habitats, low recovery.

Areeda estuary proposed marine proteced area



3.3. Proposed deep sea sites

Lebanon's territorial water contains deep sea areas, more than 1000 m depth; these areas include a number of habitats that may represent potential "hot spots" of biodiversity. Knowledge of the biodiversity associated with these habitats and ecosystems is expected to enhance significantly our understanding of biodiversity and the functioning of the deep seas. A tentative, possibly not exhaustive list of these systems includes:

a. open slope systems,

b. submarine canyons,

c. deep basins,

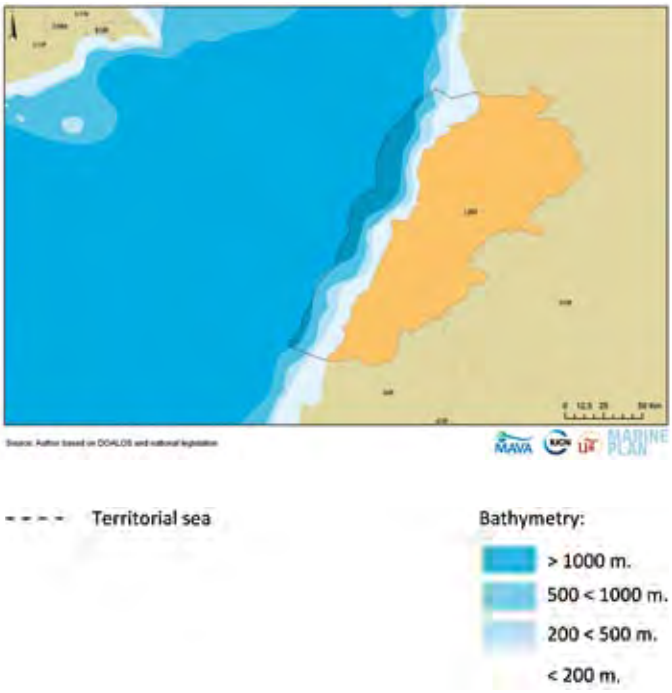
d. seamounts,

e. deep-water coral systems,

f. cold seeps and carbonate mounds,

g. hydrothermal vents, and

h. permanent anoxic systems.



OCEANA (2010) proposed 4 sites in deep water inside Lebanon's territorial waters:

1. Beirut Escarpment,

2. Saint Georges Canyon,

3. Junieh Canyon and

4. Sour Canyon.

According to the General Fisheries Commission for the Mediterranean (GFCM-FAO), a Fisheries Restricted Area (FRA) in the whole Mediterranean has been declared, concerning the ban of trawling techniques lower than 1000 m, and Lebanon territorial waters include an area of about 1240 km^2, which include the four previous features.

Lebanon could envisage two options: declare the whole area under 1000 m in the territorial waters as an MPA, or declare the four features presented above as four MPAs as a deep sea network with a common management plan.

In both cases, the following management measures could be envisaged:

a. ban of trawling as per the GFCM decision, keeping other fishing techniques (not disturbing the sea bottom) as per national legislation and

b. application of the existing national legislation and international conventions or agreements regulations for other human activities such as maritime traffic, cables and pipelines, exploration and exploitation of mineral resources (all new activities in the proposed MPA or MPAs being subject to EIA and SEA) and

c. specific conservation measures for submarine archaeological or historical sites or particular species of importance.

In addition, if considered appropriate, due to conservation elements such as the presence of marine mammals or deep sea cold corals, this site could be proposed as a SPAMI under the Barcelona Convention.

Conclusion

Marine Protected Areas are essential for healthy, functioning and resilient ecosystems in Lebanon; they help us deliver the Government's vision of a clean, healthy, safe, productive and biologically diverse sea. Some human activities damage or cause disturbance to marine habitats and their species. Within an MPA network such activities will be managed or restricted.

Specifically, MPAs enable us to:

1. Protect and restore the ecosystems in Lebanon's sea and coastline.

2. Ensure that the species and habitats found there can sustain and are not threatened or damaged.

3. Maintain a diverse range of marine life that can be resistant to changes brought about by physical disturbance, pollution and climate change.

4. Provide areas where the public can enjoy a healthy marine environment, learn about marine life and enjoy activities such as diving, photography, exploring rock pools, caves and coastal walking.

5. Provide natural areas for scientific study.

The main objective of the project **"Supporting the management of important marine habitats and species in Lebanon"** is to support the establishment of a network of marine protected areas along the Lebanese coast. The future vision for this network will be based on network design and approach applied during this study. Lebanon has declared two marine protected areas; the Palm Islands protected area in the north and the Tyre reserve in the south. According to the decision of the Ministry of Agriculture no. 385/1 dated January 26, 1997, fishing and human activities are prohibited in all estuaries which are protected all year round. This can be relied upon to protect six estuaries characterized by biological diversity.

Nine marine sites are proposed as marine protected areas for their biodiversity and the benefits for the marine environment resulting from protection. The network of marine protected areas proposed contain two declared sites, five river estuaries and nine marine locations to be declared in the future. The potential inclusion of offshore site(s) is presently under study by the MoE.

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Annex

Strategy Scientific Consultation:

Mr. Alain Jeudy de Grissac, Marine Programme Conservation Manager, IUCN Centre for Mediterranean Cooperation, Malaga (Spain) alain.jeudy@iucn.org

Gaby Khalaf , Prof., National Centre for Marine Research, National Council for Scientific Research bihar@cnrs.edu.lb, www.cnrs.edu.lb

Manal Nader, Ph.D, University of Balamond, Institute of the Environment / Marine Resources and Coastal Zone Management manal.nader@balamand.edu.lb

Michel Bariche, Ph.D, Department of Biology, American University of Beirut michel.bariche@aub.edu.lb

Dahij Mukdad, Ph.D, Ministry of Agriculture, Directorate of Rural Development & Natural Resources, Department of Fisheries & Wildlife

Seagrasses *(Cymodocea nodosa).* © Hany El Shaer.

Interviewed stakeholders:

Dahij Mukdad, Ph.D, Head of Service of Forest and Natural Wealth, Ministry of Agriculture

Mr. Samir Majdalani, Head of Department of Fisheries & Wildlife, Directorate of Rural Development & Natural Resources, Ministry of Agriculture

Mrs. Lina Yamout, Chief, Service of Environmental Guidance, Ministry of Environment. yamout@moe.gov.lb

Mrs. Viviane Sassine, Department of protection of Nature Resources, Ministry of Environment. v.sassine@moe.gov.lb

Nancy Awad, Land Use Planning Department, Council for Development & Reconstruction

Gaby Khalaf, Prof., Director, Marine Research Centre, National Council for Scientific Research. bihar@cnrs.edu.lb, www.cnrs.edu.lb

Milad Fakhry, Ph.D Océanographie opérationnelle, National Centre for Marine Research, National Council for Scientific Research milosman@cnrs.edu.lb

Manal Nader, Ph.D Director, Institute of the Environment, Marine Resources and Coastal Zone Management Programme, University of Balamond. manal.nader@balamand.edu.lb

George Mitri, Ph.D Director Biodiversity Programme, Institute of Environment, University of Balamand George.mitri@balamand.edu.lb

Manale N. Abou Dagher, M.Sc., Program Assistant, Marine Resources and Coastal Zone Management Programme, Institute of Environment University of Balamand manal.aboudagher@balamand.edu.lb

Ghassan Jaradi , Ph.D Professor of Ecology and Zoology, Faculty of Sciences, Lebanese University, Faculty of Sciences rjaradi@cyberia.net.lb

Michel Bariche, Ph.D Assistant Professor, Department of Biology, American University of Beirut. michel.bariche@aub.edu.lb

Grace Rachid, American University of Beirut. ecarg.rachid@gmail.com

Mr. Fadi Nejem, Fishermen president, Beirut, El Dora Port.

Mr. Walid Noshie, National Institute for Scuba Diving info@nisd-online.com

Mr. Roger A. Feitrouni, Atlantis Diving College, Jounieh / Lebanon

Mr. Mohamed Hamoud, Purple Reef Organization

Mr. Ziad Samaha, Purple Reef Organization

Kamal Azar, Ph.D., GIS Transport, Ltd. kazar@gistransport.com

INTERNATIONAL UNION
FOR CONSERVATION OF NATURE

IUCN-MED
Parque Tecnológico de Andalucia
Marie Curie, 22
29590 - Campanillas (Malaga), Spain
uicnmed@iucn.org
Tel +34 95 202 84 30
Fax +34 95 202 81 45
www.iucn.org/mediterranean

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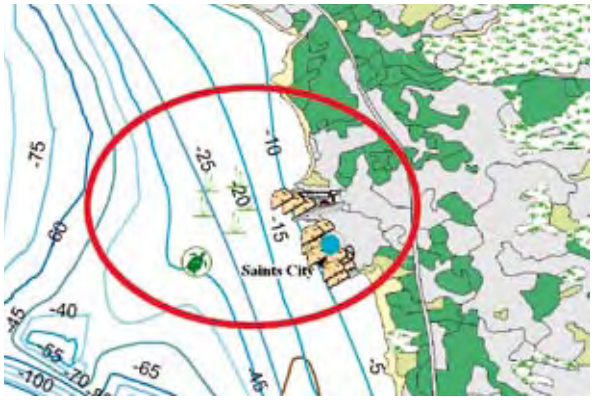

MINISTRY OF ENVIRONMENT

Lazarieh bldg. 8th flr.
P.O. Box 11- 2727
Beirut, Lebanon
Tel +9611976555 ext. 450
Fax +9611976530
www.moe.gov.lb