



**STRATEGIC ACTION PLAN FOR
THE CONSERVATION OF THE BIOLOGICAL
DIVERSITY (SAP BIO) IN THE MEDITERRANEAN
REGION**

**NATIONAL REPORT
OF ISRAEL**

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Ministry of the Environment



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THE BIOLOGICAL DIVERSITY (SAP BIO)
IN THE MEDITERRANEAN REGION
NATIONAL REPORT OF ISRAEL

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I. PREFACE

The Mediterranean region is one of the richest areas of biodiversity in the world. The historical development, long cultural history and dense population of the region have placed stress on the health of the biodiversity. Therefore, it is extremely important to protect what exists and this integrated effort by the parties to MAP was most welcomed. The initiation of the SAP BIO program was a further step towards preparation of a national strategy for the conservation and wise use of biodiversity.

As we received no budget for the project, the Israel Ministry of the Environment tried to link the preparation of the present report to other existing national activities. The on - going activities being carried out within the Ministry are mainly for the preparation of NAPs within the framework of the Barcelona Convention and the Convention on Biological Diversity. The Steering Committee for the Advancement of the NAP at the Ministry, headed by the Chief Scientist and coordinated by the Division of International Relations, monitored and accompanied the preparation of the present document.

Israel is a small country rich in biodiversity. This results from its location at the crossroads of three biogeographical regions (Mediterranean, Desert and Steppe) of various climatic conditions, topography, geomorphology, geology and soils. Its biodiversity was enhanced by the historical and geological events in the area. The area remains, however, mostly arid and lacking in natural resources.

Increasing population pressures, industrial development and economic growth have had negative environmental implications on the country. Thus, environmental awareness and nature conservation efforts recently have become more prominent on the national agenda. (The area of nature conservation has been well established in Israel for many years, through law enforcement, management, research and education.) High rates of industrialisation and urbanisation make the protection of nature reserves essential for securing the biodiversity of the natural environment. Israel's reserves vary in size, character and use. Only 3% of the Mediterranean region consists of protected nature reserves, with nearly 20% of the desert protected (half of that overlaps with military training areas). Rapid development of housing, tourism, road construction, afforestation, industry and agriculture, and further development programs threaten the continued existence and role of protected areas.

The Israel Ministry of the Environment is responsible for the protection of the environment. Already in 1963, recognition of the need to protect natural and landscape resources led to the enactment of the National Parks and Nature Reserves Law. It was revised in 1992 and in 1997, and provides the present legal structure for the protection of natural habitats, natural assets, wildlife and sites of scientific, historic, architectural and educational interest in Israel, the establishment of nature reserves and the designation of protected natural assets.

The concerted efforts to prepare a regional strategy for the protection of the Mediterranean area is essential for the benefit of all countries involved.

II. LIST OF ACRONYMS USED

CBD – Convention on Biological Diversity;
GEF – Global Environmental Facility;
IMMRAC – Israel Marine Mammal Research and Assistance Centre;
IOLR – Israel Oceanographical and Limnological Research
IUED – Israel Union for Environmental Defense;
JNF – Jewish National Fund;
MAP – Mediterranean Action Plan;
MENCA – Middle East Nature Conservation Association;
NAP – National Action Plan;
NGOs – Non-governmental Organisations;
NNPPA – Nature and National Parks Protection Authority;
RAC/SPA – Regional Activity Centre/Specially Protected Areas;
SAP BIO – Strategic Action Plan for the Conservation of the Biological Diversity;
SPA Protocol – The new Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean Sea;
SPAMIs – The Specially Protected Areas of Mediterranean Importance;
SPNI – Society for the Protection of Nature in Israel;
UNEP – United Nations Environment Programme.

III. METHODOLOGIES

The methodologies followed for the preparation of Israel's National Report were:

- Collection and classification of findings: Collection based on existing data. Information has been collected about the Conservation of the biological diversity values in the Mediterranean Region, relevant to Israel;
- Evaluation of various resources: Evaluation of the collected data is undertaken in each of the fields of information, compilation and synthesis of the existing data. Consultation with the national correspondent for the redaction of the national report;
- Integration of data and evaluation: The data and the evaluations in the various fields of information are integrated into summarising texts and tables, which can serve as background for existing or proposed plans.
- Redaction and edition of the national report, according to the Guidelines for the preparation of the national reports.

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1 INTRODUCTION

1.1 Background information

In 1975, the Mediterranean Action Plan (MAP) was ratified and approved during an Inter-Governmental Meeting convened by the United Nations Environment Programme (UNEP) in Barcelona, Spain. In 1976, the Barcelona Conference was convened by UNEP, during which representatives of the Mediterranean countries adopted the legal support needed to implement the MAP Programme. The document signed that year became known as the Barcelona Convention, an international agreement between Mediterranean countries for the protection of the Mediterranean Sea against pollution. The legal framework of the MAP programme has been enlarged and modified several times since the Barcelona Convention was adopted.

The Strategic Action Plan for the conservation of coastal and marine biodiversity in the Mediterranean Region, namely the SAP BIO project, is being implemented within the framework of MAP. The main objective of the SAP BIO project is to establish a logical base for implementing the new Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean Sea (SPA Protocol), in order to produce a SAP for the conservation of biodiversity.

The new Protocol entered into force on 12 December 1999, replacing the Protocol concerning Mediterranean Specially Protected Areas adopted in 1982. It represents a strengthening of the Geneva Protocol in several respects:

- The extension of the Protocol to the protection and management of endangered and threatened species, and to the conservation and sustainable use of biodiversity;
- The extension of its geographical coverage to the international waters of the Mediterranean;
- The establishing of a new international category of protected area, the "Specially Protected Areas of Mediterranean Importance" (SPAMIs);
- The drawing up of a list of endangered or threatened species and of a list of species whose exploitation should be regulated;
- Provisions concerning environmental impact assessment, establishing inventories, and the introduction of non-indigenous or genetically modified species.

In 1981, the Second Meeting of the Barcelona Convention decided that a Regional Activity Centre for Specially Protected Areas (RAC/SPA) would be established in Tunisia as a national institution with a regional (i.e. Mediterranean) role to play.

Under a GEF PDF-B grant, a Strategic Action Programme to address pollution from land-based activities in the Mediterranean Region (SAP MED) was developed within MAP, and was adopted by the Tenth Ordinary Meeting of the Contracting Parties to the Barcelona Convention, held in Tunis in 1997. As follow-up, the "Determination of priority actions for further elaboration and implementation of the Strategic Action Programme for the Mediterranean Sea" project was developed in the framework of the Barcelona Convention and approved by the GEF council in April 2000, and it included

the preparation of a “Strategic Action Plan for the conservation of coastal and marine biodiversity in the Mediterranean Region”, with the RAC/SPA as the Lead Agency. In formulating this project, particular attention was paid to existing plans and programmes and in particular to the Convention on Biological Diversity (CBD) signed in 1992, in Rio de Janeiro.

1.2 Objectives of the national report

The Israeli National Report, like the national reports written by the rest of the participating countries, will constitute a major input for preparing the SAP BIO. It will constitute the main output of processes to be carried out at national level, aiming at:

- identifying problems affecting biodiversity and their proximate/ultimate,
- assessing their relative importance,
- identifying national conservation priorities,
- identifying remedial actions such as: (a) preserving single endangered/threatened species/populations by special protection plans; (b) conservation of threatened habitats, communities, ecosystems, landscapes by creating Marine and Coastal Protected Areas; (c) limiting some fishing activities by instituting Fishing Exclusion Zones for some gear and/or some period of time; and (d) other actions.

1.3 Target users

The National Report is intended to be used by the SAP BIO National Action Plans for the preparation of the SAP BIO document and for national programs implementing SAP BIO. It will be used by Researchers, natural resources managers and stakeholders.

2 BASIC INFORMATION ON STATUS IN THE COUNTRY

2.1 Description of the main components of marine and coastal biodiversity

In juxtaposition to its small land area, Israel is characterised by a wide range of physical conditions and by a rich variety of fauna and flora. Israel's biodiversity is affected by its special climatic diversity (both in temperature and rainfall variation), by the human factor and by the country's geographical placement at a crossroads of continents (Africa, Asia and Europe) and biogeographical regions (the Saharo-Arabian, the Irano-Turanian and the Mediterranean). Consequently, the overall species richness is very high, peripheral populations represent most of the species, and though most of the species are not endemic to Israel, the communities are unique. The wealth of Israel's biological diversity is expressed in some 2,780 plant species, 7 amphibian, 97 reptile, 511 bird and 116 mammal species (106 terrestrial and 10 marine mammals).

The flora of Israel comprises 2,780 wild plants, including exotic species. A recent analysis for 2,412 species found in the country reveals that they belong to 700 genera and 126 families. Of these, 1,558 species are concentrated in the Mediterranean zone and 600 in the desert. Only 6 percent of the plants are endemic. The flora of Israel is generally divided into seven groups on the basis of the following distribution: Mediterranean species, distributed around the Mediterranean Sea; Euro-Siberian species, growing mainly in wet habitats and along the Mediterranean coasts; Irano-Turanian species; Saharo-Arabian species; Sudano-Zambesian species; Bi-regional, tri-regional and Alien species from remote countries.

As in the case of flora, Israel's fauna is extremely varied due to the fact that Israel is the meeting point of three climatic and vegetation regions. However, unlike its flora, which has been well studied and surveyed, Israel's fauna is not extensively known. There are 229 recognised species of inland aquatic and terrestrial molluscs with 20 exotic species and 15 species which have become extinct, largely through drainage of swamps and wetlands, pollution of coastal rivers and stream diversion. The marine fauna on the coasts of Israel appears to have been less depleted during human history than land animals. On the Mediterranean coast, the composition of fauna is determined by the relatively high salinity of the sea. Water temperature, salinity and other factors in this sea give rise to an Atlantic type of fauna, with the addition of some tropical species. Israel's marine fauna is represented by about 850 mollusc species and 410 fish species in the Mediterranean Sea.

Because invertebrates were less decimated by human activity than were the higher classes, they are the best example of the country's position as a meeting ground for creatures of extremely divergent geographic origin. In addition to countrywide species, many are restricted to limited areas such as those, which abound in the Hula Valley, the valley around the Sea of Galilee and the northern parts of the Coastal plain.

Amphibians naturally decline in number from the coast inland and from north to south with the increasing aridity in these two directions. Swamp drainage in Israel has greatly

reduced the number of local amphibians and is responsible for the extinction of one species.

Reptiles, belonging to the three orders of tortoises, lizards and snakes, are widely represented in Israel. The local species include several which are almost extinct in other parts of the world.

The number of birds species in the country (511), include 204 breeding species. There are several vagrant species and their numbers may be assumed to be on the rise.

Finally, the variety of terrestrial mammals, 106 species, is relatively large for the small area of the country.

2.2 New Protocol concerning Specially Protected Areas and Biological Diversity

2.2.1 Available documents and information in Israel

The available documents in Israel concerning Biological Diversity and Specially Concerning Areas are the following:

- “The Conservation and sustainable use of biological diversity in Israel – Report of the State of Israel on the implementation of Article 6 of the Convention on Biological Diversity”, written by the Ministry of the Environment in December 1997;
- “The Biological diversity and Sustainable Development”, written by the Ministry of the Environment in January 2002;
- “Coastal Area Management Programme (CAMP) Israel – Final Integrated Report”, written by the UNEP/MAP/PAP in 2000.
- “The Environment in Israel”, written by the Ministry of the Environment in 1998.
- “Conservation of wetlands in Israel: Israel National Report on the Implementation of the Ramsar Convention”, written by the Ministry of the Environment in 1999.
- “National planning tool for the implementation of the Ramsar Convention on Wetlands”, written by the Ministry of the Environment in 2002.

2.2.2 Activities concerning Specially Protected Areas and Biological Diversity in Israel

Israel’s national biodiversity strategy is based on a national vision whereby society appreciates and respects all life forms and sustainably uses natural resources while preserving and conserving the country’s rich biological diversity for the benefit of future generations. In order to fulfil this national vision, Israel hopes to meet its goals by the implementation of several targets:

- Developing and implementing a comprehensive plan for preserving biodiversity and for sustainable use of its components;
- Establishing a network of protected areas for the preservation of ecosystems, species and genetic resources which are capable of functioning ecologically and which are related to other open spaces such as agricultural fields;
- Rehabilitating damaged ecosystems in order to promote biodiversity;

- Coordinating the implementation of the plan among all stakeholders including governmental and non-governmental bodies, the private sector, community groups and other target populations;
- Utilising legislation, rules and procedures, budgetary allocations and other regulatory measures to establish methodologies for conservation of biological diversity and for sustainable use of resources;
- Advancing public awareness concerning the advantages of biodiversity conservation and sustainable development;
- Promoting knowledge and expertise through formal and non-formal education, ongoing research, and increased institutional capabilities;
- Harmonising national action with international and regional conventions, activities and plans;
- Implementing the precautionary approach through measures intended to forecast, prevent and combat the causes for reduction or loss of biodiversity at source;
- Integrating traditional knowledge on the conservation of biodiversity.

Every effort is being made to identify organisational frameworks capable of implementing the program and to strengthen the role of non-governmental organisations. In addition, new or amended legislation is being developed in order to strengthen natural resource conservation, to accord protection from exotic species and to prohibit commerce in indigenous species. High priority will be accorded to integrating the principles of biodiversity in educational programs on all levels.

Initiatives are also being launched to incorporate ecosystems, which are not currently represented in the national network of protected areas, marine reserves and population inventories and surveys. Recommendations for conserving and using different biotic resources are formulated, and plans for research and management of isolated populations for the purpose of their preservation are being drafted.

On the research front, efforts are concentrating on strengthening taxonomic and systematic research and monitoring global impacts and ozone depletion. An economic assessment of indigenous genetic resources, genetic engineering and use of popular knowledge of these resources is planned as well.

Recognition of the unique character of many of Israel's ecosystems has led to a number of initiatives. Thus, special protection and/or management strategies have been formulated for such unique and sensitive ecosystems as Israel's coastlines. The National Masterplan for the Mediterranean Coast, approved in 1983, aims to prevent development, which has no need for a coastal location, to protect large sections of the coastline and to allocate coastal areas for tourism and recreation activities. Furthermore, in November 1996, Israel embarked on an ambitious coastal initiative within the framework of the Coastal Areas Management Programme (CAMP) of the Mediterranean Action Plan (MAP). The program has two main objectives, which are also expected to facilitate the preparation and implementation of Israel's biodiversity strategy:

- To encourage policy makers of economic development sectors to take responsibility for the environmental impacts of their decisions and to incorporate environmental considerations in their decision-making processes;
- To provide the professional basis for policy making on issues not sufficiently covered in current coastal zone management.

2.2.3 Responsible national structures or institutions in Israel

The Ministry of the Environment is the government ministry responsible for the protection of the environment. It is also responsible for the Nature and National Parks Protection Authority, Israel's statutory agency for nature conservation. Other governmental bodies, such as the Ministry of the Interior and the Ministry of Agriculture, constitute additional partners within the framework of their responsibility for various laws that are related to the protection of biodiversity.

The Ministry of the Environment is responsible for implementation of the Biodiversity Convention. The Nature Reserves Authority is Israel's scientific advisory body to the Convention. An interministerial committee for conservation of biodiversity was selected in May of 1996 and included 12 representatives from the Ministries of Finance, National Infrastructures, Defence, Education, Foreign Affairs, Agriculture, Science, Commerce and Industry, Interior, Transport, Tourism and Environment. Several other governmental and non-governmental organisations also take part in the preparations toward the formulation and implementation of Israel's national strategy for biodiversity conservation.

The Israel Oceanographical and Limnological Research (IOLR) is a governmental, non-profit corporation. It is dedicated to advancing knowledge about the aquatic world and developing methodologies and technologies for sustainable use of coastal, marine and freshwater resources. IOLR's is providing a scientific basis for decision making on the utilisation, conservation and management of the Mediterranean Sea. Much of its scientific effort is directed to monitoring and assessing the status of this water body and predicting its response to environmental perturbations.

2.2.4 Level of awareness in Israel

In Israel the general public only awakened to the need for environmental protection in the 1980s and 1990s. Yet, despite a slow start, recent years have witnessed a dramatic increase in environmental awareness and activism. To a large extent, the growth of environmental consciousness is reflected in the growing numbers of non-governmental organisations (NGOs), which have taken root and sprouted in recent years.

Education and public awareness programs are largely promoted by NGOs, principally by the Society for the Protection of Nature in Israel (SPNI). Every year, this organisation reaches hundreds of thousands of children, youth and adults through its educational

trips, courses, training programs, public campaigns and publications. Major emphasis is placed on conservation of biodiversity. The SPNI and Tel Aviv University have launched scientific, educational and conservation activities on avian fauna.

Other important NGOs play a role in the conservation process:

The Jewish National Fund (JNF) has been instrumental in reclaiming, developing and afforesting the land of Israel since its establishment;

The Israel Marine Mammal Research and Assistance Centre (IMMRAC) is dedicated to gaining biological and ecological knowledge on populations of marine mammals in the southeastern Mediterranean and northern Red Sea;

The Israel Union for Environmental Defense (IUED) has been especially active in river rehabilitation and coastal and open space conservation;

GreenAction, which was set up in 1994 to raise consciousness in the Israeli community and provide a forum for the public to express grievances over environmental issues;

The Public Council for the Preservation of Open Landscapes and Land Resources has taken an active part in classifying open space landscapes into units according to criteria, which relate to the characteristics and functions of landscape units;

Green Course is an NGO launched on a dozen university and college campuses throughout the country. It has concentrated on environmental campaigns for the preservation of the coasts as open spaces;

Middle East Nature Conservation Association (MENCA) is a member of IUCN and its aim is to promote nature conservation and environmental protection in the Middle East;

GreenPeace inaugurated its Israeli office in 1995 and their initial campaigns have focused on prevention of Mediterranean pollution;

Finally, EcoPeace, founded in 1994 by Egyptian, Jordanian, Palestinian and Israeli environmentalists, is actively involved in assessing and monitoring environmental implications of projects or activities that are likely to have transboundary impacts and to addressing common regional environmental issues. In 1998, EcoPeace became the Middle East chapter of Friends of the Earth.

The Nature and National Parks Protection Authority (NNPPA) is a governmental body that operate local and regional visitor and instruction centres in nature reserves throughout the country. The centres provide information on the landscape, geology, botany and zoology of a given area by means of creative displays, maps and pamphlets. They work alongside local schools in providing information on the biodiversity of a given region. A few publications in Hebrew, notably Ecology and the Environment which includes English abstracts, provide information on biodiversity issues in Israel. The Israel NNPPA has recently inaugurated a new Internet site, which presents its animal and plant observation database. The database is open to the public and provides tools for querying on observations of species in specific areas, inventories of species in specific areas, and observations of specific species in the entire area of Israel.

The level of government and local authority sensitivity and awareness of nature conservation is well developed in Israel. This is manifested in legislation and in the establishment of institutions that concentrate themselves on to the subject.

2.2.5 Major stakeholders involved

The major stakeholders involved in the process are the governmental and non-governmental institutions, the universities and research institutions, development agencies and banks.

The major governmental institution is the Ministry of the Environment that operates on three levels - national, district and local.

At the national level, the Ministry is responsible for formulating an integrated and comprehensive national environmental policy; developing specific strategies, standards and priorities for environmental protection; coordinating cooperation with other agencies; and guiding the district and local levels in the implementation of national policy.

At the district level, the Ministry has six district offices that coincide with the administrative boundaries established under the Planning and Building Law in order to facilitate administrative coordination with both planning authorities and the municipal sector. The district administration is charged with implementing national environmental policy on a district level.

Local authorities serve as the implementing arm of the central government in carrying out environmental policy on the local level. Municipalities are responsible for local environmental planning, operation and maintenance of environmental infrastructures. In improving environmental services at the local level, the Ministry of the Environment has assisted local municipalities for the past 20 years in establishing professional environmental units.

In 1998, the Nature Protection and National Parks Authority (NNPPA) was set up under the responsibility of the Ministry of the Environment. The new administration unites the Nature Reserves Authority (NRA) and the National Parks Authority (NPA). The NRA was originally established to preserve and cultivate nature reserves and natural assets, and to protect wildlife and the beauty, diversity and integrity of Israel's landscapes. The National Parks Authority (NPA) was originally created for the purpose of dealing with the design, restoration, care and development of national parks. The union of the two authorities, legislated in April of 1998, constitutes an effective framework for enforcement and conservation, dedicated to developing, protecting and promoting Israel's natural, historical and recreational sites that have been, and are currently, in the process of formally becoming, national parks and nature reserves.

Other governmental institutions involved in the process of formulating and implementing Israel's national strategy for biodiversity conservation are the ministries of Finance, National Infrastructures, Defence, Education, Foreign Affairs, Agriculture, Science, Commerce and Industry, Interior, Transport, Tourism and Environment.

The major non-governmental institutions are the Society for the Protection of Nature in Israel (SPNI) and the Israel Union for Environmental Defence (IUED), which have been taking a lead role in increasing public awareness of coastal conservation issues. They have issued a series of position papers, booklets and status reports on coastal protection

and on principles for sustainable development of urban shores. Their objective is to initiate an open and transparent planning procedure based on discussions with all stakeholders and interaction between the public, planners and decision makers.

The major universities and research institutions involved are the Israel Marine Mammal Research and Assistance Centre (IMMRAC), established in 1995 under the Centre for Maritime Studies of Haifa University. It is dedicated to surveying marine mammals, especially dolphins, along the Mediterranean coastline and gaining biological and ecological knowledge on populations of marine mammals in the southeastern Mediterranean and northern Red Sea. A National Rescue Centre for Marine Turtles was established in 1999 to provide hurt or weak marine turtles with medical attention before release.

2.2.6 Legal regulations for the protection of biological diversity:

Sensitivity to and awareness of nature conservation is well developed in Israel; in fact, it preceded environmental awareness by about two decades. This is manifested in legislation and the establishment of institutions that address themselves to the subject. The following list of existing legislation enables the implementation of any national plan for the protection of biological diversity:

- Forest Ordinance, 1926;
- Fishing Ordinance, 1937;
- Petroleum law, 1952;
- Wildlife Protection Law, 1955;
- Plant Protection Law, 1956;
- Water Law, 1959;
- Port and Trains Authority Law, 1961;
- Bathing Places Law, 1964;
- Streams and Springs Authorities Law, 1965;
- Planning and Building Law, 1965;
- Ports Ordinance, 1971;
- Prevention of Marine Pollution by Oil Ordinance, 1980;
- National Masterplan for National Parks, Nature Reserves and Landscape Reserves, 1981;
- Planning and Building Regulations (Environmental Impact Statements), 1982;
- Prevention of Marine Pollution (Dumping of Waste) Law, 1983;
- National Masterplan for the Mediterranean Coast, 1983;
- Prevention of Marine Pollution from Land Based Sources Law, 1988;
- National Parks, Nature Reserves, Memorial Sites and National Sites Law, (Henceforth “the Nature Reserves Law”), 1992;
- Hazardous Substances Law, 1993;
- Prohibition of Vehicle driving Along the Coast Law, 1997.

2.2.7 List of international Conventions, Protocols signed or ratified by Israel

- International Convention for the protection of new varieties of plants signed in 1961 and revised in 1972, 1978 and 1991;
- International Convention for the Prevention of Pollution from Ships, ratified in 1973. The Convention was modified by the Protocol of 1978, is now called MARPOL 73/78;
- Convention of Wetlands of International Importance (Ramsar), signed in 1971 and ratified in 1996;
- Barcelona Convention for the Protection of the Mediterranean Sea against pollution, signed in 1976;
- Protocol concerning cooperation in combating pollution of the Mediterranean Sea by Oil and Other Harmful substances in case of emergency, signed in Barcelona in 1976;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), signed in 1980;
- Protocol for the Protection of the Mediterranean Sea against pollution from land-based sources, signed in 1980;
- Protocol concerning Mediterranean Specially Protected Areas, signed in 1982;
- Convention on the Conservation of Migratory Species of Wild Animals, signed in 1983;
- Pollution Preparedness Response and Cooperation Convention (OPRC), signed in 1990;
- Convention on Wetlands of International Importance, signed in 1993 and ratified in 1996;
- Convention on Biological Diversity (Rio de Janeiro), ratified in 1995;

2.2.8 International cooperation and assistance in the country

Israel's contribution to the protection of the Mediterranean Sea environment has been carried out within the framework of the Mediterranean Action Plan (MAP). MAP is widely acclaimed as a model of regional cooperation. Since its creation in 1975, it has constituted a forum, which enables direct contact and professional cooperation between Israel and its Arab neighbours. Although the initial focus of the MAP was on marine pollution control, experience soon confirmed that environmental protection is inseparably linked to social and economic development. Therefore the MAP has gradually shifted from a sectoral approach to pollution control, to integrated coastal planning and management. Twenty years after the initial adoption of the MAP, Phase II was introduced along with a new "Action Plan for the Protection of the Marine Environment and the Sustainable Development of the Coastal Areas of the Mediterranean". Israel has been an active member of the organisation throughout the years, and has contributed to all components of the action plan: legal, socio-economic and scientific.

After Israel's ratification of the Barcelona Convention for the Protection of the Mediterranean Sea against pollution, it has actively participated in all components of the plan (the Blue Plan, the Priority Actions Programme and the monitoring and research program known as MEDPOL).

Ratification of the 1990 Pollution Preparedness Response and Cooperation Convention (OPRC) is expected shortly. This will allow Israel to take part of in regional arrangements for combating marine pollution and to develop and implement a national contingency plan and its regional agreements for marine pollution prevention.

In addition, efforts are now focused on ratifying international agreements for compensation in case of large-scale accidents – the civil liability Convention (CLC) and the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (Fund Convention). The decision to allow the voluntary TOVALOP and CRISTAL arrangements to expire in February 1997 has crystallised preparations for ratifying the two conventions.

2.2.9 Need for technical assistance in the country

In general, national and regional plans prepared in Israel since 1990 have included new features in terms of the environmental issues addressed and the tools for addressing those issues. Some innovations were first introduced into masterplans during the 1990s, such as the National Plan for the Mediterranean. In addition, there has been a shift from a reactive approach to an active approach in environmental planning. While previously the goal of most environmental planning efforts was to mitigate deleterious effects of various projects, the environmental goals of the new national masterplans are increasingly to improve resource protection and promote sustainable development.

Clearly, Israel already has the necessary legal framework to protect its biodiversity, and therefore, a national strategy plan for biological diversity may be implemented through the enforcement of these laws.

To date, Israel has not given high priority to conservation and sustainable use of biodiversity, largely due to its uncertain political, social and regional circumstances. These circumstances are also expressed in financial constraints. As a result, the programs of work for implementing different articles of the Biodiversity Convention have not yet been integrated into national policy and action plans, and financial allocations for implementation have been inadequate.

3 ANALYSIS OF THE PRESENT SITUATION

3.1 Assessing the status of marine/coastal biodiversity at national level

Israel is characterised by a wide range of physical conditions and by a rich variety of fauna and flora. Historic, geographical, geological and climatic factors contribute to the high rate of species diversity in Israel, when compared to other regions of Mediterranean climate and European neighbouring countries. The rough topography, lithological diversity and climatic heterogeneity have given rise to a wide variety of life zones, habitats, and accordingly to a multitude of vegetation units. Israel is generally divided into three longitudinal belts – the Coastal plain, the Mountain Ridge and the Rift Valley – and it is the geographical limit of distribution of numerous species: the southern limit of species widely distributed over the entire Mediterranean climate; the northern limit of Saharan or Asian desert species and the western limit of Irano-Turanian species.

Israel's geographic location at the junction of three continents coupled with the climatic changes throughout the history of this region have been largely responsible for this country's high diversity of species. Furthermore, Israel is a main migration route for Palearctic birds and it is the only terrestrial meeting point for organisms from Europe, Asia and Africa. It serves as a terrestrial bridge connecting the temperate zone in the north with arid desert areas and further south with the rainy and hot forests of Africa and Asia.

The wealth of Israel's biological diversity is expressed in some 2,780 plant species, 7 amphibian, 97 reptile, 511 bird and 116 mammal species.

Some species of fauna and flora are endemic and have remained in this country and its vicinity from prehistoric times when climatic conditions were different than today's. Present geographical conditions are not conducive to an increase in this endemic, residual component since Israel constitutes a bridge between continents and is open to invasion from three directions.

Israel's Mediterranean coastline stretches some 195 kilometres from north to south. The major ecological feature of the Mediterranean coast of Israel is that it constitutes the northernmost sector of the Nile littoral cell, which extends from the coastal zone of the Nile Delta to the end of Haifa Bay at Acre.

The northern (Mediterranean) component is particularly significant in Israel's world of flora and fauna and encompasses species, which abound in Israel's Mediterranean coastline. These species may have invaded this area from the north at a relatively late period, when present climatic conditions began to stabilize in this region, along with the development of the evergreen scrubland.

In 1997, a first list was drawn to estimate the numbers of all of the country's living species based on the findings of several individual reports and surveys undertaken by numerous investigators. There are about 51,000 living species in Israel. About 47,000 (92 percent) species are known, or thought to be known, and another 4,000 (8 percent)

are species, which are assumed to be found or identified in the future. Heywood and Watson (1995) list some 1,750,000 living described species, based on several sources, as the total global biodiversity, meaning that Israel's biodiversity (including viruses) comprises about 3 percent of the global biodiversity. This rich biodiversity is largely attributed to the Mediterranean and the Red seas, the two species-rich seas around Israel.

Little is known about many *Protoctista* phylums. Some, like the *Formanifera* phylum, is estimated to be represented by about 300 species in the Mediterranean, including deep seawater species.

The algae taxa include about 500 macro-algae species mainly in the Mediterranean. While the micro-algae number is not yet clear, it may elevate the total number even higher.

The 2,780 wild plant species include exotic species. Of these, 1,558 species are concentrated in the Mediterranean zone and 600 in the desert. Only 6 percent of the plants are endemic. About 500 of the plant species are found in wetlands and moist habitats, including marine habitats. A recent analysis for 2,412 species found in the country reveals that they belong to 700 genera and 126 families. Only 6 percent of the plants are endemic.

The insect species number – 20,500 – (45 percent of all species) is lower than the global percentage due to two factors: the presence of two species-rich seas around Israel and the fact that most of the global insect fauna is in the tropics, while Israel is depauperated because it is situated in a largely arid region.

The unique phenomenon of the vermetid reefs¹, and the low-diversity native flora and fauna species of the eastern Mediterranean, include high numbers of Indo-Pacific immigrants through the Suez Canal. Some 410 fish species including 55 (13.5 percent) Indo-Pacific species and 850 mollusc species are recorded along the Mediterranean Sea. (2,200 total mollusc species is 1,728 total fish species in Israel).

The number of bird species (511) includes 204 breeding species. Marine birds nest on some islets situated on the Mediterranean coast of Israel, and about 2,000 cormorants (*Phalacrocorax carbo*) winter on the northern islets. The large bird species number is due to the fact that Israel is on the migration route from Europe and West Asia to Africa and back, that there are many different habitats in the country, and that Israel is a crossroad of three continents, climatic regions and biogeographical units.

The 97 reptile species belong to the three orders of tortoises, lizards and snakes, widely represented in Israel. The local species include several which are almost extinct in other parts of the world.

Finally, there are 106 terrestrial mammals species and an estimated ten more marine mammal species. This number is relatively large for the small area of the country,

¹ Vermetid reefs are unique phenomena that occur in the Mediterranean, only on the eastern coasts. These reefs are small-rimmed intertidal structures, which developed in the subtropical marine water of the southern Levant, and the Atlantic (Bermuda) coasts at about the same latitude. They are also known as "serpulid reefs", although in both areas they are mainly built by molluscs (*Dendropoma spp.* in both places and *Vermetus triquetrus* only in the Levant). They can exist only where soft and erodable coastal rocks rise at an appropriate rate relative to the marine erosion. The rim of *D. petraeum* is about 10 cm high, creating an interface shallow lagoon where dense algal meadows develop with diverse and rich intertidal fauna.

however the number of individuals has greatly decreased, especially in the last century, due to hunting in the beginning of the century and, more recently, habitat destruction and poisoning.

Although additional surveys and studies are required to fill gaps in knowledge concerning the status of Israel's fauna, the country's foremost zoologists believe that almost one third of Israel's vertebrates have suffered either extinction or a reduction in their populations in this century alone due to human activity, whether hunting, agricultural practices, urban and industrial development, or poisoning. While some of these changes were inevitable (e.g., veterinary supervision and increased irrigation), others were preventable such as the controversial draining of Lake Hula in the 1950s, which destroyed a unique wetlands ecosystem.

3.2 Issues affecting the marine and coastal biodiversity status at national level

In Israel, there are several issues adversely affecting the status of the marine and coastal biodiversity at national level.

About 70 percent of Israel's population lives within 15 kilometres of the Mediterranean coastline and the country's major economic and commercial activity is concentrated there. Other activities, which affect the coastal environment, are the industry, refining and commerce that take place in the ports of Haifa, Ashdod and Ashkelon. The damage caused to beaches by marinas and other offshore structures is another matter of serious concern. These structures have depleted the coastline of sand, on the one hand, and have diminished the coastal resources available to the general public, on the other hand. Furthermore, power generating facilities along the coast use Mediterranean waters for cooling, consequently heating up the water of the nearby environment and modifying the basic conditions of the habitats.

Another factor affecting biodiversity is environmental pollution, especially sewage. The discharge of raw or partially treated sewage mainly affects the breeding places of amphibians. As an arid country, Israel has only six amphibian species; a seventh, newly described, became extinct as a result of habitat destruction soon after it was discovered. The flow of sewage into their habitats has polluted some breeding sites.

The Israeli Mediterranean coastline includes 14 proposed marine nature reserves with a total length of about 35.5 km and another 20 declared and proposed coastal reserves extending about 44 km, mostly in parallel sections. Ten national parks dot the Mediterranean coastline. Nevertheless, the main problem facing nature conservation in the Mediterranean region is habitat fragmentation. The Mediterranean region, and in particular the coastal plain, is densely populated and only 3% is currently protected within nature reserves (most of the country's nature reserves are found in the desert area

of Israel, and a large number overlap military training). Protection of many populations is impossible to achieve within the reserve system in the Mediterranean region.

Many reptiles have a restricted distribution in certain habitats so that development threatens their survival. For example, the lizard, *Acanthodactylus schreiberi*, lives in the coastal plain on sand-loam soils, which are developed for agriculture and settlements. Since no nature reserves exist to preserve this habitat, this lizard is threatened by extinction.

Another problem that occurred lately is the increasing jeeps and cars driving on the coastal plain of the Mediterranean Sea, during the day and at night. This issue is not only problematic for the sensitive fauna and flora, but also for the public.

In the past, marine turtles were frequently seen on the Israel coasts. The main problem that caused their extinction was the heavy turtle hunting between the two World Wars. In the 50s, the coasts destruction influenced strongly the marine turtles' reproduction and the number of nests continued to drop. One additional problematic issue that rose in recent times is the lightening of coastal roads. Those relatively new structures have hurt on marine turtles and other organisms that depend on light and darkness navigation sources for their own location.

Finally fishing on the Mediterranean coast is a questionable issue, being the main problem for biodiversity conservation in the last 50 years, causing the decrease of fish population and other marine organisms. Even though fishing is less popular nowadays, marine turtles are regularly wounded and killed. In the Mediterranean Sea, hundreds specimens are hurt each year.

Table 3.1: Table representing the issues adversely affecting the status of marine and coastal biodiversity.

ISSUES	PROBLEMS	STATUS	TREND
1. Coastal tourism or mass tourism along the coast	Trampling, driving, making noise.	Israel's Mediterranean coastal plain.	Increase
2. Extensive infrastructure development	Construction of buildings, harbours and marinas. Destruction of sea cliffs and beaches.	Israel's Mediterranean coastal plain.	Slow increase
3. Lightening of beach roads	Lightening of parking areas and roads close to the sea.	Israel's Mediterranean coastal plain.	Slow increase
4. Environmental Pollution	Raw or partially treated sewage and heavy metals.	Coastal areas close to cities, Kishon River and Shafdan.	Slow decrease
5. Thermal pollution	Heating up of seawater close to the power station.	Hadera, Ashdod and Haifa.	Stable
6. Invasive species	Invasion of alien specie on the Mediterranean coastline.	Israel's Mediterranean coastal plain.	Stable
7. Habitat fragmentation.	Protected habitat fragmentation in the Mediterranean region.	Israel's Mediterranean coastal plain.	Increase
8. Fishing	Fishing on the Israeli Mediterranean coast	Israel's Mediterranean coastal plain.	Stable

Table 3.2: Assessing the problems resulting form the former issues.

ISSUES	THREATS	CAUSES	IMPACT	SIGNIFICANCE
1. Coastal tourism or mass tourism along the coast	Damaging nesting sites, hurting and disturbing organisms in their reproduction.	Mechanical damage caused by illegal entrance on the coastal zone. Over frequentation of beaches.	High	Damaging nesting sites of marine turtles.
2. Extensive infrastructure development	Habitats destruction	Mechanical damage, destruction of habitats.	High	Disturbing and damaging sensitive fauna and flora.
3. Lightening of beach roads	Affects organisms using light and darkness for their location.	Electric lightening at night.	Medium	Affects marine turtles and other organisms using light and darkness for their location.
4. Environmental Pollution	Pollution of the marine habitats and of the organisms.	Low implementation of the water protection laws.	Medium	Affects the breeding places of amphibians.
5. Thermal pollution	Damaging and modifying habitats near the power station. Disturbing marine organisms.	The power station uses seawaters for cooling, thus heating up the water of the nearby environment.	Medium	
6. Invasive specie	Invasive specie domination on local flora.	Domination of invasive specie on local species.	Medium	Invasion of <i>Acacia saligna</i> (introduced for sand stabilisation)
7. Protected habitat fragmentation.	Restricted distribution and extinction of some species.	Some protected populations protection is impossible due to the natural reserves position.	High	The lizard <i>Acanthodactylus schreiberi</i> is threatened by extinction.
8. Fishing	Capture of juvenile, reproduction rate reduction.	Fishing in sensitive zones, physical damage to marine organism.	Medium	Hundreds hurt marine turtles each year.

4 PRIORITIES FOR ACTION

An indispensable part of any national strategy for the conservation of biodiversity is the setting of national conservation priorities for action. In Israel, the following priority actions have been selected:

Table 4.1: Priority action 1.

PRIORITY ACTION 1	Preparation of the National Biodiversity Strategic Action Plan - NB SAP
Justification	Importance for the country to define the aims and objectives of the National Plan, to prepare it and start implementing it.
Description	Cooperative work between different sectors, integration of the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies. Developing of national strategies, plans or programmes, taking into consideration the existing legislation, for the conservation and sustainable use of biological diversity.
Targets	Having a National Plan and its implementation.
Responsibility	Ministry of the Environment.
Prerequisites needed for implementation	Existing appropriate legislation and sufficient budget to engage experts and support the developing of the project.
Support needed	Budget, from inner and outside bodies.

Table 4.2: Priority action 2.

PRIORITY ACTION 2	Reducing the negative effects on coastal and marine biodiversity
Justification	The existence of factors negatively affecting the marine and coastal biodiversity.
Description	Reduction of the coastal tourism, mass tourism along the coast, extensive infrastructure development, lightening of beach roads, environmental pollution, thermal pollution, invasive species, habitat fragmentation and fishing.
Targets	Control of the invasive species entrance, reduction of the coastal infrastructure development and of pollution, developing a sustainable integrated national planning.
Responsibility	Ministry of the Environment.
Prerequisites needed for implementation	Existing appropriate laws, laws implementation and enforcement.
Support needed	Budget and awareness of local and governmental bodies.

Table 4.3: Priority action 3.

PRIORITY ACTION 3	Evaluation of the biodiversity situation
Justification	The current taxonomy and database is very limited.
Description	Development of biodiversity database, classification of the areas according to their importance for biodiversity conservation.
Targets	Israeli database strengthening, taxonomy collection. Mapping and listing Hot Spots and Red Book.
Responsibility	Ministry of the Environment.
Prerequisites needed for implementation	Research programs for database collection. Universities and research institutes support and cooperation for taxonomy collection.
Support needed	Budget.

5 INVESTMENT PORTFOLIO

The conservation of biological diversity and resources requires investments inter alia in staff, in infrastructure, in research and in education. The priority actions selected above have not yet been estimated financially.

Table 5.1: Investment portfolio for the priority actions.

PRIORITY ACTION	RESPONSIBILITY	TARGETS	ESTIMATED COST in US \$
Priority action 1 Preparation of the National Biodiversity Strategic Action Plan - NB SAP	Ministry of the environment	Having a National Plan and its implementation.	Not yet known
Priority action 2 Reducing the negative effects on coastal and marine biodiversity	Ministry of the environment	Control of the invasive species entrance, reduction of the coastal infrastructure development and of pollution, developing a sustainable integrated national planning.	Not yet known
Priority action 3 Evaluation of the biodiversity situation	Ministry of the environment	Israeli database strengthening, taxonomy collection. Mapping and listing Hot Spots and Red Book.	Not yet known

6 SUGGESTED FOLLOW-UP

6.1 Follow-up proposal at national level

6.1.1 Aims and general objectives

Israel's national biodiversity strategy is based on a national vision. In this vision, society values and respects all life forms and sustainably uses natural resources. At the same time the country's rich biological diversity is preserved and conserved for the benefit of future generations.

This national vision is based on the following principles:

- All forms of life have essential value;
- The survival of humankind is dependent on the conservation of biological diversity. Therefore humankind is obligated to preserve biodiversity and to sustainably utilise natural resources;
- The ecological approach is central to achieving the conservation of biodiversity;
- Development must be ecologically and economically sustainable;
- Biodiversity is best preserved in nature;
- Traditional expertise and knowledge must be preserved;
- Actions must be based on best available information, but they must also accord with the precautionary principle;
- Actions must be based on global cooperation in sharing information related to cost/benefit assessment.

In order to fulfil this national vision, Israel has formulated several objectives aimed at protecting, assessing, utilising and benefiting from biodiversity and its components. These general goals include:

- Increasing efforts to preserve biological diversity and sustainable use of biological resources;
- Initiating an ecological approach to management, which is based on an understanding of ecosystem functioning, biological inventory, reliable data, integrated planning and monitoring systems;
- Increasing public participation in planning, developing and implementing biological diversity policies in accordance with the provisions of the Biodiversity Convention;
- Striving to achieve an optimal balance between regulatory action, on the one hand, and education, on the other, in order to promote responsible public behaviour;
- Contributing to the international effort to preserve biological diversity.

6.1.2 Central components of the National Strategy

The central components of the National Strategy are the following:

1. Declaration of at least 10 percent of each ecosystem as a nature reserve;
2. Preservation of 20 percent of all open spaces as scrubland, half of which will be natural scrubland;
3. Establishment of regulatory and other controls on the use of biological resources;

4. Implementation of an environmental impact assessment system to control pollutants, which threaten to damage ecosystems;
5. Protection of the diversity of domesticated races;
6. Monitoring and establishment of a database to assess the status of species and ecosystems and to establish priorities for conservation;
7. Incorporation of such considerations as natural resource conservation and ecological functioning of ecosystems in development decisions;
8. Promotion of regional and international cooperation.

In addition, the general national policies proposed for coastal resource management contain the following points:

1. Development other than for essential coastal uses should not be permitted along the coast and its immediate surroundings;
2. Policies for recreation and tourist development should ensure that opportunities for a variety of daytime activity and overnight accommodation experiences are made available to the entire population;
3. Recreation and tourist development of the surroundings should be confined to centres. In order to protect as much open space as possible, linear development along the coastline should not be permitted;
4. Highly intensive uses should be confined to existing urban centres;
5. Sites not previously developed, where resources were identified as having recreation potential, could be designated for low intensity levels of development;
6. Offshore construction for recreation and water sport activities should be restricted to urban centres;
7. A public footpath should be designated along the coastline to ensure public access by foot to and along the coastline.

6.1.3 Actions towards the Strategic Action Plan

In order to conserve biodiversity, activities must be started in a number of areas. Of top priority is the continued development of the network of nature reserves in Israel and the preservation of essential habitats. If Israel's protected areas had been large enough, it is possible that the country's nature reserves would have been sufficient to preserve species diversity, the second component of biodiversity. However, since Israel is a small country and the areas left for nature protection are small and fragmented, additional steps must be undertaken to preserve the diversity of species.

The Mediterranean coast of Israel includes 14 proposed marine nature reserves with a total length of about 35.5 km and another 20 declared and proposed coastal reserves extending about 44 km, mostly in parallel sections. There are also two marine protected belts along the shore, between Rosh HaNiqra and Akhziv (north of Acre) and between Atlit and Dor (south of Haifa) where all fish, molluscs and most marine invertebrates are fully protected under separate bylaws. Marine protected belts are generally included in the proposed marine nature reserves. Ten national parks also dot the Israeli Mediterranean coastline.

In many cases, the need to protect specific species is clear and in such cases reserves are indeed declared for their protection. However, in order to determine for which species

such conservation activities are required, it is first necessary to assess the diversity of species in Israel. Therefore, the Nature and National Parks Protection Authority is currently preparing a comprehensive plan for preserving nature in Israel's open spaces. A central criterion in the assessment process is the potential of the area to protect biodiversity. Thus, the plan will also constitute an important step in preserving the diversity of ecosystems.

6.1.4 Responsibility for implementation

Israel's strategy relates both to habitats and to key species such as endangered species, endemic species, species of international importance and Red Book species. Indicators for implementation are being designated for both habitats and species.

Every effort is being made to identify organisational frameworks capable of implementing the national program and to strengthen the role of non-governmental organisations. Additionally, new or amended legislation is being developed in order to strengthen natural resource conservation, to accord protection from exotic species and to prohibit commerce in indigenous species.

6.1.5 National plan for research

The first step, toward the National Plan, is to develop a national biodiversity digital database on the species level. The biodiversity database will be used to assess biodiversity and classify areas by their importance for biodiversity conservation. The second step will be multivariate correlation of the biological and abiotic data and numerical classification of areas according to ecosystems.

The national biodiversity database will contain data from many sources currently spread among several bodies and non-governmental databases. This information, arranged on a GIS system, will cover a wide range of taxonomic groups at many temporal and spatial scales. This will allow analysis at many levels, from populations to landscapes, and from seasonal to long-term patterns. Priorities for data accumulation will be given to taxa whose members can serve as umbrella species².

In addition, it is currently envisaged that mapping will be a fundamental component of Israel's biodiversity strategy because it provides an estimate of the past and present distribution and abundance of many species found in Israel. Various types of analysis will be undertaken to determine areas of high species diversity, for each taxon separately and any combination of taxa. Comparing distribution and abundance of species from the past and their current distribution will point to the species and areas that are most threatened by human development. It will also help predict and explain "hot spots" in biodiversity in one or more taxonomic groups.

² Umbrella species have been defined by Heywood as "species whose occupancy areas (plants) or home range (animals) are large enough and whose habitat requirements are wide enough that, if they are given a sufficiently large area for their protection, will bring other species under that protection."

6.1.6 Major stakeholders involved

The major stakeholders who have a role in the conservation of coastal and marine biodiversity, and that would thus participate in the whole process, particularly in implementing the strategy at national level are governmental (Ministry of the Environment and the Nature Protection and National Parks Authority) and non-governmental institutions (Society for the Protection of Nature in Israel), the universities and research institutions, development agencies and banks.

6.2 Follow-up proposal at regional level

6.2.1 Suggested actions by national need

Some projects are suggested by national needs but their implementation requires being undertaken at regional level with the involvement of some bordering countries:

- Project on the sea turtles protection:

This project has been started a few years ago and it nowadays needs the involvement of neighbouring countries: Cyprus, Lebanon and the Palestinian Authority (Gaza strip).

- Invasive species project:

This project needs the cooperation of neighbouring countries, such as Egypt and Lebanon, in order to make the invasive species project more efficient. An actual example of invasive specie that needs a national management plan is the invasion of *Acacia saligna*.

- Fish management:

To have an efficient fish management, there has to be an involvement at regional scale, involving Israel's neighbouring countries.

6.2.2 Assistance for follow-up

- Professional training from the majority of the countries;
- Specific managing plan;
- Financial or professional support form countries, which are involved in the SAP BIO.

Several of the components of Israel's Strategic Action Plan for the conservation of the biological diversity are already in place. These components include legal framework, participation in international conventions and initiatives, surveys and research, and concrete programs for the conservation and sustainable use of ecosystems, species and genetic resources. The subject has been accorded greater priority in recent years with the growing awareness that land scarcity, coupled with unprecedented population and economic growth, threaten to deplete Israel's natural resources and open space landscapes. In Israel, experts believe that the disappearance of large tracts of the country's open spaces-and the biodiversity within them - may still be halted, but only if action is taken today to promote a policy of sustainable land development which integrates development needs with open space and biodiversity conservation. Israel is now investing additional efforts in drafting and implementing an integrated and comprehensive Strategic Action Plan for the conservation of the biological conservation, which will promote better coordination among all stakeholders.

REFERENCES

1. MINISTRY OF THE ENVIRONMENT, 1999. "Conservation of wetlands in Israel: Israel National Report on the Implementation of the Ramsar Convention".
2. MINISTRY OF THE ENVIRONMENT, 2002. "National planning tool for the implementation of the Ramsar Convention on Wetlands".
3. MINISTRY OF THE ENVIRONMENT, 2002. "The Biological diversity and Sustainable Development".
4. MINISTRY OF THE ENVIRONMENT, 1997. "The Conservation and sustainable use of biological diversity in Israel – Report of the State of Israel on the implementation of Article 6 of the Convention on Biological Diversity".
5. MINISTRY OF THE ENVIRONMENT, 1998. "The environment in Israel".
6. NIR PAPAYE, 2001. "Israel's beaches 2001 – The coastal organisations Forum Report about the Mediterranean Sea situation" (in hebrew).
7. NIR PAPAYE, 2002. "Israel's beaches 2002 – The coastal organisations Forum Report about the Mediterranean Sea situation" (in Hebrew).
8. UNEP/MAP/PAP, 2002. "Coastal Area Management Programme (CAMP) Israel – Final Integrated Report".