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REPORT OF THE MEETING OF EXPERTS FOR THE ELABORATION OF THE ACTION PLAN CONCERNING SPECIES INTRODUCTIONS AND INVASIVE SPECIES IN THE MEDITERRANEAN SEA

Introduction

1. At the suggestion of the Meeting of National Focal Points for SPAs, the Contracting Parties to the Barcelona Convention asked RAC/SPA to work on elaborating an Action Plan on the introduction of species and on invasive species in the Mediterranean Sea. To this end, RAC/SPA invited the National Focal Points for SPAs to appoint experts to represent their respective countries in elaborating the said Action Plan and at the Meeting of Experts to be organised on the subject. RAC/SPA then consulted with the appointed experts (by e-mail) with a view to preparing a draft Action Plan, to be submitted as a working basis for the Meeting of Experts.
2. The objective of the Meeting of Experts (Barcelona, 24-26 October 2002) was to review the draft **Action Plan on the introduction of species and on invasive species in the Mediterranean Sea**. The draft Action Plan will also be reviewed by the Sixth Meeting of Focal Points for SPAs with a view to its being submitted to the Contracting Parties for adoption.
3. The Meeting was organised thanks to the generous contribution made by the Autoritat Portuària de Barcelona and the Departament di Medi Ambient (Generalitat de Catalunya).

Participants

4. At the Meeting were experts appointed by the following Contracting Parties to the Barcelona Convention: Albania, Bosnia-Herzegovina, Croatia, Cyprus, Egypt, Greece, Israel, Italy, Lebanon, Morocco, Slovenia, Spain, Syrian Arab Republic, Tunisia and Turkey.
5. The following organisations were represented by observers: the Barcelona Port Authority, the Faculté des Produits de la Mer of the Université d'Égée (Izmir), the Grupo Especies Invasoras (GEI), the International Maritime Organization (IMO) and the IUCN-Centre for Mediterranean Cooperation.
6. RAC/SPA provided the Secretariat for the Meeting.
7. A complete list of participants appears in Appendix I to the present Report.

Agenda item 1: - Opening of the Meeting

8. The Meeting was opened at 9.45 a.m. in the auditorium of the Consorci del Far, Centre dels Treballs del Mar (Carrer Escar 6-8, 08039 Barcelona), on Thursday

24 October 2002. The opening session was chaired by M. Josep Oriol, the Director of the Autoritat Portuària de Barcelona (APB).

9. At the opening session, Mr. Mohamed Adel Hentati, the Director of RAC/SPA, welcomed participants and thanked the local authorities for the generous contribution they had made in organising the Meeting. He paid particular tribute to the Barcelona Port Authority and to the Generalitat de Catalunya's General Environment Board. He then recalled the objectives of the Meeting of Experts, stressing the importance of the subject of species introduction, the pertinence of which had been brought up on several occasions at international gatherings, particularly at the last Earth Summit, held in Johannesburg.
10. Then Mr. Jordi Romeva, speaking on behalf of the Director of the General Environment Board, welcomed participants and expressed pleasure in seeing RAC/SPA continue its collaboration with the Catalan authorities. On this subject, he referred to the March 2002 joint organising by RAC/SPA and the Ministry of the Environment of Catalonia of a Mediterranean Symposium on marine and coastal protected areas, which had been extremely successful. Mentioning the subject of the Meeting, Mr. Romeva emphasized the need to give greater importance to the introduction of species and to promote collaboration to face up to this and avoid its negative effects. He said that RAC/SPA's choice of the Barcelona Port Authority as partner for organising this Meeting was extremely judicious, in that the Port of Barcelona had done so much in the field of the environment generally, and that of ballast water management in particular.
11. In his opening speech, Mr. Josep Oriol said that the problems posed by the introduction of invasive species did not concern experts only, since these were complex issues that required the collaboration of several actors as well as international cooperation. He then enumerated the known sources of species introduction into the marine environment, giving some concrete examples, and showing to what extent the introduction of species via ballast water could harm the natural environment and considerably hamper human activity. After enumerating the many environmental initiatives carried out by the Port of Barcelona at national and European level, Mr. Oriol said he was extremely satisfied to see the Port of Barcelona host this Meeting, and wished the Meeting the greatest success in its work.
12. As part of this opening session, three presentations were made, by (i) Mr. Jordi Vilà (head of the APB's environmental department), on the studies done by the Port of Barcelona concerning ballast water, (ii) the Secretariat, on the Meeting's objectives and institutional and thematic frameworks, and (iii) Mr. Steve Raaymakers (IMO), on the aims and activities of the GLOBALLAST project.
13. Participants were then requested to give short presentations to inform the Meeting about the activities their countries were undertaking to control the introduction of non-indigenous marine species and/or to mitigate the impact of invasive marine species. Summaries of these presentations appear in Appendix III to the present Report.

Agenda item 2: - Rules of procedure

14. The Meeting noted that the rules of procedure adopted for meetings and conferences of the Contracting Parties to the Convention for the Protection of the Mediterranean Sea against Pollution, and its related Protocols (UNEP(OCA)/IG.43/6, Annex XI), would apply *mutatis mutandis* to its deliberations.

Agenda item 3: - Election of officers

15. After the customary informal consultations, the Meeting unanimously elected the following officers:

Chairperson: Mrs. Stavroula Spyropoulou (Greece)
Vice-Chairpersons: Mr. Sükran Cirik (Turkey)
Mrs. Marie Abboud-Abi Saab (Lebanon)
Rapporteur: Mr. Abdellatif Bayed (Morocco)

Agenda item 4: - Adoption of the Agenda and organisation of work

16. The Meeting adopted the provisional Agenda, proposed by the Secretariat, distributed as UNEP(DEC)/MED WG.213/1 and annotated in document UNEP(DEC)/MED WG.213/2. The Meeting also reviewed and adopted the proposed timetable appearing at the end of document UNEP(DEC)/MED WG.213/2. The Agenda appears in Appendix II to the present Report.

Agenda item 5: - Elaboration of the Action Plan concerning species introductions and invasive species in the Mediterranean Sea

17. The Secretariat presented the document UNEP(DEC)/MED WG.213/3, the DRAFT ACTION PLAN ON THE INTRODUCTION OF SPECIES AND ON INVASIVE SPECIES IN THE MEDITERRANEAN SEA. It indicated that the draft Action Plan suggested to the Meeting was devised as a short-term strategy for strengthening the Mediterranean countries' capacities to control species introduction and mitigate its negative effects.

18. The Meeting first reviewed the general structure of the Action Plan. Several representatives spoke to express the need (or not) to include in the Action Plan a lexicon containing definitions of the main terms used. To conclude the debate on this subject, the Meeting decided to use, for the purposes of the Action Plan, the definitions adopted within the framework of the Convention on Biological Diversity (CBD), until these were reviewed and possibly adapted to the Mediterranean context at the Mediterranean workshop proposed in paragraph 21 of the Action Plan.

19. The Meeting also agreed to refer, within the framework of the Action Plan, to the guiding principles set out in the CBD's Decision VI/23, until these were submitted for in-depth discussion at the said Mediterranean workshop, with a view to

arriving at guiding principles and approaches to be included in the guidelines provided for in paragraph 20 of the Action Plan.

20. The Meeting then proceeded to an in-depth examination of the suggested Action Plan. During the discussion on the Action Plan, speakers raised several points and suggested changes to a certain number of paragraphs. The Meeting's work led to a version of the draft Action Plan that was approved by all participants. This version appears in Appendix IV to the present Report. However, it was not possible to adopt for paragraph 7 language that satisfied all the participants. Therefore, it was decided to keep paragraph 7 between brackets with a view to submitting it in two versions (the version elaborated during the Meeting, along with the version of the same paragraph appearing in document UNEP(DEC)/MED.WG 213/3) to the next Meeting of the NFPs for SPAs.

Agenda item 6: - Any other matters

21. No other points than those on the Agenda were raised by participants.

Agenda item 7: - Adoption of the Report of the Meeting

22. The Meeting adopted its Report along with the draft Action Plan concerning species introductions and invasive species in the Mediterranean Sea, as amended.

Agenda item 8: - Closure of the Meeting

23. After the customary exchange of courtesies, the Meeting was closed by the Chairperson on Saturday 26 October 2002 at 5 p.m.

Appendix I

LIST OF PARTICIPANTS

**REPRESENTATIVES OF THE CONTRACTING PARTIES
REPRESENTANTS DES PARTIES CONTRACTANTES**

ALBANIA – ALBANIE**Mr. Arian PALLUQI**

Specialist
Fishery Directorate
Ministry of Agriculture and Food
Tirana
Albania
Tel: +355 42 228 621
Fax: +355 42 228 621
E-mail: Roland.Kristo@dfishery.gov.al

**BOSNIA AND HERZEGOVINA
BOSNIE-HERZEGOVINE****Mr. Ivan BUNTIC**

Head of Environment Department
Cantonal Ministry of Civil Engineering, Physical
Planning and Environment Protection
3, Stjepana Radica
88000 Mostar
Bosnia and Herzegovina
Tel: +387 36 312 189
Fax: +387 36 312 190
E-mail : ivan.buntic@tel.net.ba

CROATIA – CROATIE**Ms. Sanda MARINOV**

Institute for Oceanography and Fisheries
Laboratory of Phytoplankton
Setaliste Ivana Mestrovica 63
21 000 Split
Croatia
Tel: +385 21 358 688
Fax: +385 21 358 650
E-mail : sanda@izor.hr

CYPRUS – CHYPRE**Mrs. Marina ARGYROU**

Fisheries and Marine Research Officer
Marine Biology and Ecology Section
Department of Fisheries and Marine Research
13 Aeolou Street
1416 Nicosia
Cyprus
Tel: +357 22 303 864
Fax: +357 22 775 955
E-mail: margyrou@cytanet.com.cy

EGYPT – EGYPTE**Dr. Nasser GALAL**

Assistant Director for Planning
Protected Areas Sector in South Sinai
Egyptian Environmental Affairs Agency (EEAA)
30 Misr Helwan Al-Ziraei Road
Maadi - Cairo
Egypt
Tel: +202 5248 792 / 5271 391
Fax: +202 5248 792 / 5271 391
E-mail: ngalal@link.net

GREECE – GRECE**Mrs. Stavroula SPYROPOULOU**

Ministry of the Environment, Physical Planning and
Public Works
General Directorate for the Environment
Environmental Planning Division
Nature Management Section
36, Trikalon Street
GR-11526 Athens
Greece
Tel: +30 210 69 18 202
Fax: +30 210 69 18 487
E-mail: tdfp@minenv.gr

ISRAEL – ISRAËL**Prof. Bella GALIL**

Senior Scientist
National Institute of Oceanography
Israel Oceanographic and Limnological Research
P.O.B. 8030
Haifa 31081
Israel
Fax: +972 48 511 911
E-mail: bella@ocean.org.il; Galil@post.tau.ac.il

ITALY - ITALIE**Prof. Anna OCCHIPINTI**

Full Professor of Ecology
Dip. Genetica e Microbiologia
Sez. Ecologia
Università di Pavia
Via Sant'Epifanio, 14
27100 Pavia
Italy
Tel: +39 382 304876
Fax : +39 382 304610 / 528496
E-mail: occhipin@unipv.it

LEBANON – LIBAN

Prof. Marie ABOUD-ABI SAAB

Directrice des Recherches
Centre National des Sciences Marines
P.O.Box 534
Batroun
Liban
Tel: +961 6 741 582/3
Fax: + 961 6 741 584
E-mail: mabisaab@cnsr.edu.lb

MOROCCO – MAROC

Prof. Abdellatif BAYED

Professeur responsable de l'Unité d'Océanologie
Biologique
Université Mohamed V - Agdal
Institut Scientifique
Département de Zoologie et Ecologie Animale
Av. Ibn Battota
B.P. 703, Agdal
10106 Rabat
Maroc
Tel : +212 37 77 45 48/49/50/55
Fax : +212 37 77 45 40
E-mail: bayed@israbat.ac.ma

SLOVENIA – SLOVENIE

Mr. Matej DAVID

Assistant
University of Ljubljana
Faculty of Maritime Studies and Transportation
Pot pomorscakov 4
SI-6320 Portoroz
Slovenia
Tel:+386 5 6767 222
Fax:+386 5 6767 150
E-mail: matej.david@fpp.uni-lj.si

SPAIN – ESPAGNE

Ms. Laura CAPDEVILA

Invasive Species Group
C/ Tarifa, 7
24012 – Navatejera (León)
Spain
Tel: +34 626 169 568
Fax: +34 987 263 527
E-mail: gei.invasoras@wanadoo.es
ayr.org@wanadoo.es

**SYRIAN ARAB REPUBLIC
REPUBLIQUE ARABE SYRIENNE**

Dr. Amir IBRAHIM

Head of the High Institute of Marine Research
Tishreen University
P.O.Box 2242
Lattakia
Syria
Tel: +963 41 428 690
Fax: +963 41 428 780
E-mail: tu-himr@scs-net.org

TUNISIA – TUNISIE

Mr. Mohamed Nejmeddine BRADAI

Maître de Recherche
Département Biodiversité et Biotechnologie
Institut National des Sciences et Technologies de
la Mer (INSTM)
Centrale de Sfax
BP 1035
3018 Sfax
Tunisie
Tel: +216 74 49 71 17
Fax: +216 74 49 79 89
E-mail: mednejmeddine.bradaï@instm.rnrt.tn

TURKEY – TURQUIE

Prof. Sükran CIRIK

Dokuz Eylül Üniversitesi
Deniz Bilimleri ve Teknolojisi Enstitüsü
Institut des Sciences et Technologies Marines
Département des Ressources Vivantes
Haydar Aliyev Bulvarı No:10
İnciraltı 35340 Izmir
Turkey
Tel: +90 232 278 52 62/278 65 15
Fax: +90 232 278 50 82
E-mail: cirik@imst.deu.edu.tr

UNITED NATIONS BODIES AND SECRETARIAT UNITS
SECRETARIAT DES NATIONS UNIES

REGIONAL ACTIVITY CENTRE FOR SPECIALLY PROTECTED AREAS (RAC/SPA)
CENTRE D'ACTIVITES REGIONALES POUR LES AIRES SPECIALEMENT PROTEGEES (CAR/ASP)

Mr. Mohamed Adel HENTATI
Director

Mr. Chedly RAIS
Scientific Director

Ms. Souha EL ASMI
Assistant to Projects

Mrs. Anne MURRAY
Reviser

Regional Activity Centre for Specially Protected
Areas (RAC/SPA)
Boulevard de l'Environnement
BP 337
1080 Tunis Cedex
Tunisie
Tel: 216.71.795 760
Fax: 216.71.797 349
E-mail: car-asp@rac-spa.org.tn

Mrs. Jacqueline BUISSERET
Interpreter

Mr. Lindsay KEAN
Interpreter

INTERNATIONAL MARITIME ORGANIZATION (IMO)
ORGANISATION MARITIME INTERNATIONALE (OMI)

Mr. Steve RAAYMAKERS
Technical Adviser
International Maritime Organization
Marine Environment Division
4 Albert Embankment
London SE1 7SR
UK
Tel: +44.20.7587 3251
Fax: +44.20.7587 3261
E-mail: sraaymak@imo.org

**REPRESENTATIVES OF PARTNERS PARTICIPATING IN THE ORGANISATION OF THE
MEETING**
***REPRESENTANTS DES PARTENAIRES CONTRIBUANT A L'ORGANISATION DE LA
REUNION***

BARCELONA PORT AUTHORITY
AUTORITE PORTUAIRE DE BARCELONE

Mr. Josep ORIOL

Director
Autoritat Portuària de Barcelona
Tram VI, Sector 6
08039 Barcelona
Catalunya - Spain
Tel: +34.93 298 21 00
Fax: +34.93 298 21 29

Mr. Jordi VILA

Head of the Environment Service
Autoritat Portuària de Barcelona
Tram VI, Sector 6
08039 Barcelona
Catalunya - Spain
Tel: +34.93 298 21 00
Fax: +34.93 298 21 29
E-mail: jordi_vila@apb.es

Mr. Agusti PALAU

Environmental Service
Autoritat Portuària de Barcelona
Tram VI, Sector 6
08039 Barcelona
Catalunya - Spain
Tel: +34.93 298 21 00 / +34 64 6695 205
Fax: +34.93 298 21 29
E-mail: agusti_palau@apb.es / eboreal@hotmail.com

Ms. Oihane CABEZAS

Tecnic Environmental
Pilar Kalea 1-3.EZK
20304 IRUN (Guipúzcoa)
Spain
Tel: +34 65 8731 274
E-mail: oihanecb@hotmail.com

ENVIRONMENT DEPARTMENT OF THE GENERALITAT DE CATALUNYA
DEPARTMENT DE L'ENVIRONNEMENT DE LA GENERALITAT DE CATALUNYA

Mr. Jordi ROMEVA

Director
Direcció General de Patrimoni Natural i del Medi Físic
Departament de Medi Ambient
Generalitat de Catalunya
Dr Roux, 80
08017 Barcelona
Spain
Tel: +34.93 567 41 65
Fax: +34 93 280 33 20
E-mail: ajromma1@correu.gencat.es

**INTERNATIONAL AND/OR NON-GOVERNMENTAL ORGANIZATIONS
ORGANISATIONS INTERNATIONALES ET/OU NON GOUVERNEMENTALES**

**FACULTE DES PRODUITS AQUACOLES DE L'UNIVERSITE D'EGEE (IZMIR)
THE FACULTE OF AEGEAN UNIVERSITY OF AQUACULTURE PRODUCTS (IZMIR)**

Mrs. Semra CIRIK ALTINDAG

Prof. Dr Enseignante-chercheur
Faculté des Produits Aquacoles de l'Université d'Egée
Département Aquaculture
Izmir - Turquie
Tel: +90 232 388 3225
Fax:+90 232 388 3685
E-mail: cirik@sufak.ege.edu.tr

**INVASIVE SPECIES GROUP
GRUPO ESPECIES INVASORAS (G.E.I.)**

Mr. Bernardo ZILLETI

Co-ordinator
C/ Moisés de León nº 22 Bajo
E-24006 León
Spain
Tel: +34 987 263 527 / +34 609 859 119
Fax: +34 987 263 527
E-mail: gei.invasoras@wanadoo.es

**IUCN CENTRE FOR MEDITERRANEAN COOPERATION
CENTRE DE COOPERATION MEDITERRANEENNE DE L'UICN**

Ms. Imène MELIANE

Marine Programme Officer
Parque Tecnológico de Andalucía
Calle Maria Curie, 35
Campanillas
29590 Malaga
Spain
Tel: +34 9 52 028 430
Fax: +34 9 52 028 145
E-mail: imene.meliane@iucn.org

Appendix II

AGENDA OF THE MEETING

AGENDA OF THE MEETING

1. Opening of the Meeting
2. Rules of procedure
3. Election of officers
4. Adoption of the Agenda and organisation of work
5. Elaboration of the Action Plan concerning species introductions and invasive species in the Mediterranean Sea
6. Any other matters
7. Adoption of the Report of the Meeting
8. Closure of the Meeting

Appendix III

**BRIEF REPORTS GIVEN BY THE REPRESENTATIVES OF THE
CONTRACTING PARTIES WITHIN THE FRAMEWORK OF THE
OPENING SESSION (AGENDA ITEM 1)**

Brief report given by the representative of Albania within the framework of the opening session (Agenda item1)

INTRODUCTION OF NON-INDIGENOUS MARINE SPECIES IN ALBANIA AND MITIGATE MEASURES

Prepared by
Arian PALLUQI

Ministry of Agriculture and Food
Department of Fisheries
Pilot Fishery Development Project

The problem of prevention and control of the introduction of new non-native species is arranged by the Law No. 7908 date 05/04/1995 "For Fishery and Aquaculture". In the article 265 of this law is expressed that: "The import of eggs, larvae and fingerlings of every aquatic organism should be done upon a particular authorisation from the Ministry of Agriculture and Food". Furthermore, in the article 27 is precised that in the licences' Board for this purpose "take place representatives of the Ministry of Environment and other research institutes in the fishery sector".

Besides what expressed above, every importer of live fish organisms, indigenous or non-indigenous species, following the provisions of the Law No 7674, date 23/02/1993 "For veterinary service and inspectorate", is obliged to have a specific veterinary import permission firstly submitting the appropriate documentation on the country of origin and veterinary certificate.

Situation in the past

Fishery sector is of a specific importance for the Albanian economy, not only for the revenues that it generates, but also for the fact that this sector is one of the main suppliers of domestic market with high-value proteins food products.

Based on the conditions offered by the country, agriculture development and construction of more than 600 irrigation reservoirs, as well as low cost and high growth rate of Chinese fish species, their intentional introduction was the first done in our country in the early '60ies.

The fact that Chinese fish species: silver carp (*H. molitrix*), big head carp (*A. nobilis*), and grass carp (*C. idella*) are not reproduced in the nature, except their original country, minimize their environmental impact and does not bring a direct threat for the biodiversity. Furthermore, this fact is more obvious in comparison with another species such as crucian carp (*C. auratus*) that is introduced accidentally. The proliferation of this species have caused a biological invasion in the Shkodra Lake and caused the decline of the native species of the lake as common carp and unfavourable socio-economic effects.

Other species, accidentally introduced in our boundary waters are pikeperch (*S. lucioperca*) and perch (*P. fluviatilis*), but in this case, it can be assessed that socio-economic affects of introduced species are beneficially.

Another species, intentionally introduced for scientific research purposes is Nile tilapia (*O. niloticus*), but the fact that in all natural waters in Albania the average temperature is 5-6° Celsius during winter time, helps in not having survival meaning not having spreading and invasion of this species.

Marine aquaculture was not developed in our country and the first efforts have been taken in the early '90ies. This period has been characterised by changes in the socio-economic system and by an obvious lack of the legal framework in general and environmental legislation, in particular. As a result of the development of private initiative in the marine aquaculture sector, during 93-94 were introduced two non-native species, such as shrimp (*M. japonicus*) and manila clam (*R. philipinarum*).

In the first case, an existing fish farm (approximately 200 ha) designed for the cultivation of Chinese fish species and situated at the seashore, was re-designed for the cultivation of carp. This activity is ongoing nowadays.

For the next year, it is foreseen to be undertaken a study in the Adriatic coast to find out if the individuals that has been escaped from the farm has caused any defect in the population of the native species *M. kerathurus*.

On the other hand, Manila clam has been cultivated in an area of 200 ha in the Velipoja Lagoon, north of Albanian coast, but till now it has not been observed any distribution of this species in other coastal lagoons.

However, it should be stressed that both species have been introduced through larvae importing from Mediterranean countries, in particular, shrimp from Greece and Clam from Italy.

Legal framework

In Albania has been approved the Law No. 7664 date 21/01/1993 "For the Protection of environment" and in the article 4 of this law is expressed that the biodiversity problems will be arranged by a specific law. The Ministry of Environment has prepared the Law "On the Biodiversity" and it is hoped to be approved in the Parliament within this year. In this law it is foreseen a specific Chapter for the prevention and control of the introduction of new non-native species in our country.

Till now the problem of prevention and control of the introduction of new non-native species is arranged by the Law No. 7908 date 05/04/1995 "For Fishery and Aquaculture". In the article 26 of this law is expressed that: "the import of eggs, larvae and fingerlings of every aquatic organism should be done upon a particular authorisation from the Ministry of Agriculture and Food". Furthermore, in the article 27 is precised that in the licences' Board for this purpose "take place representatives of the Ministry of Environment and other research institutes in the fishery sectors".

Besides what expressed above, every importer of live fish organisms, indigenous or non-indigenous species, following the provisions of Law No 7674, date 23/02/1993 "For veterinary service and inspectorate", is obliged to have a specific veterinary import permission firstly submitting the appropriate documentation on the country of origin and veterinary certificate.

Brief report given by the representative of Bosnia and Herzegovina within the framework of the opening session (Agenda item1)

STATUS OF INTRODUCED SPECIES IN BOSNIA & HERZEGOVINA

Prepared by
Ivan BUNTIC

We may consider two areas of B&H waters separately. First area is marine waters and second estuarine-wetland area of Hutovo Blato.

Marine area

As this area is practically part of inshore Mali Ston Bay (Croatia), we may conclude based on these data. In the last few years, no non-native species were observed in this area, or in vicinity. Contrarily, in near offshore Croatian waters (for example), we observed significant number of new species (previously not recorded in Adriatic), such as *Caulerpa taxifolia*, *Caulerpa racemosa*, or fish species such as groupers, *Epinephelus aeneus* or *Mycteroperca rubra*. However, these fish species are native for Mediterranean waters and their recent colonization of Adriatic waters was explained as result of warming of Mediterranean waters.

Finally, we may conclude that B&H marine waters are still free of any introduced species. But, final confirmation of this statement is possible only after research of marine ecosystems.

Estuarine-wetland area of Hutovo blato

This area is presently object of research under EU-Life Third Countries funded project. Among other subjects, ichthyology survey was also executed. Composition of specific wetland habitats was evaluated quantitatively and qualitatively. This shows that abundance of introduced species is on critical level, especially in the Svitava and Deran Lake. The greatest threat is pumpkinseed, *Lepomis gibbosus*, which today present second fish in number, after native roach, *Rutilus basak*. In general, all shallow and warmer lakes are dominated with introduced species, such as tench, *Tinca tinca* or goldfish, *Carassius auratus auratus*. Native species still dominate in the colder water bodies, such as Jelim and Škrka Lake and small colder streams. The most abundant native species is roach.

The main reason for introduction of new species was to enhance economic properties of the wetlands, due to the fact that except eel and mullet, there is no interesting commercial commodity among native fish composition. The target species was common carp and practice of its introduction is 100 years old. It started in the late 19-th century during ruling of Austro-Hungarian Empery. The massive common carp repopulation was especially frequent in the last thirty years. Managed badly and uncarefully, and without scientific support, this practice was source of constant introduction of other species of no economic value, and in most cases harmful to native species.

Brief report given by the representative of Croatia within the framework of the opening session (Agenda item1)

**THE INTRODUCTION OF MARINE SPECIES IN THE MEDITERRANEAN SEA
(PATHWAYS AND RECOMMENDATIONS TO PREVENT AND CONTROL THEIR
NEGATIVE IMPACTS)**

Presented by
Sanda MARINOV

Institute of Oceanography and Fisheries
Tel: (385) 21 358 688
Fax: (385) 21 358 650

In the last few decades new species of phytoplankton, zooplankton, benthic algae and fishes have been observed in the eastern Adriatic Sea.

A considerable number of non-indigenous phytoplankton species are recognised out of which *Spatulodinium pseudonoctiluca* and *Pseliodinium vaubanii* (Dinoflagellatae) are important due to their establishment in eutrophic neritic communities. For some species, such as *Alexandrium minutum* and *Prorocentrum minimum* that cause red tides, it is not certain, due to their small sizes, whether they existed in the Adriatic before or it is a recent introduction. In 1989 toxic shellfish poisoning (DSP) has been recorded, caused by members of genus *Dinophysis*. It is not certain whether poisoning was caused by occurrence of new morphotypes or environmental changes brought upon species.

Among new zooplankton species, it is interesting to mention the following species *Xystonellopsis brandti*, *Amphorides laackmanni*, *Protorhabdonella simplex*, *Acantostomella lata*, *Petalotricha ampulla*, *Cadonaria cistellula* (Tintinidae) that can be considered as indicators of water mass movements.

Benthic algae *Caulerpa taxifolia* was first found in 1994 and *Caulerpa racemosa* in 2000. Due to their fast spreading they represent considerable threat to regional biodiversity. For many new species of fishes we cannot define their exact ecological impact.

Brief report given by the representative of Cyprus within the framework of the opening session (Agenda item1)

CONTROLLING INTRODUCTIONS IN CYPRUS

Presented by
Marina ARGYROU

Legislative and Statutory Measures

A number of laws exist in Cyprus, which are related directly or indirectly with the control of the introduction of live animals into the Republic. Some of these address, in general, the veterinary aspects of introduction concerning mainly the welfare of animals and the spreading of contagious diseases and though, these may prevent in some degree the control, they cannot prohibit the importation.

To the contrary, importation and introduction of aquatic species into the Cyprus Republic is controlled by the provisions of the Fisheries Law (Cap 135) and Regulations (1990-2000). According to these Regulations, no person can import into the Republic alive aquatic animals at any stage of growth, without securing a written permit by the Director of the Department of Fisheries and Marine Research (DFMR). The Regulations also state that no live aquatic animal can be introduced into any inland waters without acquiring a written permission by the Director of DFMR.

The main scopes of these Regulations are:

- to control the import of aquatic species into Cyprus, which are intended for ornamental or aquaria or culture purposes. Permission for imports is granted after examining each application on its own merits. The Director may refuse to grant permits for a number of reasons e.g., if there is evidence that the introduction of any species into the island is likely to contravene any International Convention or Agreement the country has ratified, or if such an introduction is likely to have adverse effects on the biodiversity or ecology of the island,
- to discourage unauthorized stocking of inland waters with fish etc. and at protecting and regulating the exploitation of the existing ichthyofauna by anglers. The stocking of inland waters (man-made reservoirs) and the fish management is implemented by the Department of Fisheries and Marine Research (DFMR). DFMR introduced mainly in the late 60s and early 70s about 20 species of freshwater fish in the reservoirs for stocking and recreational purposes (angling), since no indigenous freshwater fish exist in Cyprus (except eels *Anguilla anguilla*).

Moreover, within the framework of the CITES Convention, a Technical Committee was established under the coordination of the Environment Service of the Ministry of Agriculture, Natural Resources and Environment, consisting mainly by the relevant Departments, such as Department of Fisheries and Marine Research (DFMR),

Veterinary Services etc., which are dealing with the importation and introduction of live animals into the Republic. Its main aim is to control the introduction of the species, which are likely to be a potential threat to the island's biodiversity.

Cyprus also in its accession process into EU is making the necessary preparations for adopting the Acquis Communautaire into the National Legislation.

To this end, a new Law on Nature Conservation has recently been drafted and is now on the final stages of its adoption. In relation to the aspects of importation of alien species into the Republic, this Law provides the establishment of four Committees, which will deal with 1) Aquatic/marine species, 2) Terrestrial fauna Species, 3) Flora and 4) Birds. This Law provides *inter alia* of the control of the importation of species into the country. It includes species, which are protected under the EU Habitat Directive and a number of Conventions (i.e., CITES etc.).

As far as the aquaculture aspects is concerned, the Government of Cyprus took the decision, applying the principle of precautionary approach, that the species used for marine aquaculture will be only Mediterranean species, in order to avoid the risk of releasing into the marine environment of non-indigenous species. Furthermore, for the establishment and/or expansion of existing fish farms in Cyprus, an E.I.A. study on the impacts on the environment from aquaculture activities is a prerequisite according to the E.I.A. Law N. 57(I) 2001.

License for permission for the establishment and operation of a fish farm as well as for the discharge or disposal of fish farm products in the waters of any sea area or in the inland waters of the Republic is granted by the Director of DFMR according to the Aquaculture Law N. 117(I) 2000.

Research Activities in relation to the Invasive Marine Species

The DFMR carries out comprehensive studies on the marine macrobenthos and a list of soft-bottom macrobenthic species, which includes *inter alia* the lessepsian species appeared in the coastal waters of Cyprus, has been published and is regularly updated. Research Activities include also studies on the distribution and expansion of non-native macroalgae, such as the Red Sea migrant *Caulerpa racemosa* and its impact on the marine macrobenthos of Cyprus.

Brief report given by the representative of Greece within the framework of the opening session (Agenda item1)

PRESENTATION OF GREECE

Presented by
Stavroula SPYROPOULOU

The coastline of Greece extends to 17,000 km and is the longest in the Mediterranean. Six species of macrophytes can be considered as probably introduced species to the Greek coasts. The species *Caulerpa racemosa* represents the most recent and important expansion along the Aegean coasts. Moreover, the seagrass *Halophila stipulacea*, represents a considerable expansion from southern to central Aegean coasts.

With regard to Alien Gastropod Species, only 6 out of the 9 reported can be considered as true alien species. Considering the Bivalvia, only 1 alien species has been so far from the Greek Seas.

Up to 13 fish species, considered as Lessepsian migrants, have been recorded in the Greek seas. Most of them have been recorded up to the Dodekanese area, five of them further up to the central Aegean and one in the Ionia Sea. Their population in the Dodekanese and the rest of the Aegean are relevantly small and first indications in the Aegean show that the abundance of native species has not been affected as yet.

Legislative measures (e.g. license by the fisheries department) govern the introduction of species in aqua culture in lagoons, lakes, rivers and the sea. However, there is growing concern that more research has to be carried out to clarify the status in all vectors of introduction, including those of the aquaculture.

Brief report given by the representative of Israel within the framework of the opening session (Agenda item1)

**MEETING OF EXPERTS FOR THE ELABORATION OF A DRAFT ACTION PLAN
FOR THE CONTROL OF INVASIVE SPECIES INTRODUCTION
SUBMISSION BY ISRAEL**

Presented by
Bella GALIL

Shipping is considered the largest single vector for the movement of non-indigenous aquatic species across the globe. However, in the Mediterranean, vessel transported exotics and intentional and unintentional mariculture transfers lag far behind the number of species introduced through the Suez Canal. Erythrean macrophytes, invertebrates and fish are found in most coastal habitats in the Eastern Mediterranean. Some invaders have outcompeted or replaced native species locally, some are considered pests or cause nuisance, whereas other invaders are of commercial value. The rate of marine biotic invasions has increased in recent decades; collectively they exert significant ecological or economic impacts.

Already some Erythrean invaders spread as far as Malta, Sicily and Southern Adriatic Sea; were global warming to affect the Mediterranean sea-water temperature, thermophilic invasive species would gain a distinct advantage over the native fauna.

Considering that most non-indigenous and invasive species in the Mediterranean arrived through the Suez Canal, we call for creation of an expert group to study the possible impact of a freshwater or hypersaline lock in the Suez Canal on reducing the risk of transport of Erythrean species into the Mediterranean.

Brief report given by the representative of Italy within the framework of the opening session (Agenda item1)

ACTION PLAN ON THE INTRODUCTION OF SPECIES AND ON INVASIVE SPECIES IN THE MEDITERRANEAN SEA

Presented by
Anna OCCHIPINTI

The Italian Marine Biology Society (SIBM) has appointed a special working group on non-indigenous species that has been operating since 1999, preparing an annual report, following the standard of ICES Working Group on Introductions and Transfers of Marine Organisms (WGITMO). In 2001, SIBM produced a study under contract by the Ministry of Environment (Inspectorate for the Defence of the Sea) including survey of the ports of Genoa, Salerno and Palermo. The final report on the activity, aimed at preparing the information basis and guidelines for regulatory activities in the field of marine biological invasions. Sheets illustrating the main introduced species are also included.

A convention has been signed this year in order to support continuously the Ministry of Environment in matters dealing with biological aspects of marine environment included introduced species.

A two-year program is starting to provide a geographical data bank, foster taxonomic expertise and perform risk assessment.

Italy has signed and ratified international acts and has issued laws to implement European Directives; the regional laws are following the precautionary approach. Nevertheless a strong effort is needed to co-ordinate and organise the relevant institutions in order to assess the actual situation and manage the risk from invasions in the marine environment. This aim can only be achieved through a real international co-ordination.

A code of practice, similar to that of ICES, on the introductions and transfers of marine organisms is strongly needed.

Brief report given by the representative of Lebanon within the framework of the opening session (Agenda item1)

RAPPORT DU LIBAN SUR LA SITUATION ACTUELLE RELATIVE AUX INTRODUCTIONS D'ESPECES ET AUX ESPECES INVASIVES EN MER MEDITERRANEE

Présenté par
Dr Marie ABBOUD-ABI SAAB

Centre National des Sciences Marines
B.P. 534, Batroun - Liban

Le Liban présente une côte de 220 km sur la façade Est de la Méditerranée. Outre les entrées progressives d'espèces à travers le canal de Suez (Migration Lessepsienne), les principales causes d'introduction d'espèces dans les eaux libanaises sont : le transport des espèces par les coques des navires (fouling) et le déversement des eaux de Ballast.

Les travaux de recherches ont montré qu'en cas des poissons, 30 espèces sur environ 222 sont d'origine indo-pacifique dont 12 sont commercialement importantes. Concernant les espèces benthiques, sur 662 espèces 37 sont introduites. La flore benthique lessepsienne, établie sur la côte libanaise, ne cause pas actuellement des problèmes majeurs à l'exception de l'algue *Styopodium schimperi* qui est bien installée et peut envahir de grandes surfaces dans la région tout en produisant saisonnièrement des couvertures denses quasi-monospécifique. En ce qui concerne le plancton, et vue l'absence de recherches en Méditerranée Orientale avant l'ouverture de canal de Suez, on peut dire qu'un grand nombre d'espèces est commun entre la mer Rouge et la Méditerranée et sur 750 micro et mésozooplancton, environ 200 espèces sont communes entre les deux mers (e.g. 40 % d'espèces de tintinnides sont indo-pacifiques) et autant de phytoplancton, particulièrement les dinoflagellés.

Sur le plan national, le Liban a un programme de surveillance des zones littorales dans le cadre des activités du Centre National des Sciences Marines. Sur le plan régional, plusieurs projets en coopération bilatérale avec des pays méditerranéens sont en cours, le Liban participe à toutes les activités et les projets relatifs à la protection du milieu marin. Beaucoup de groupes taxonomiques restent à explorer dans le domaine d'introduction d'espèces en milieu marin libanais et à surveiller la tendance d'organismes déjà introduits.

Brief report given by the representative of Morocco within the framework of the opening session (Agenda item1)

RESUME POUR PAM RELATIF AUX INTRODUCTIONS D'ESPECES ET AUX ESPECES ENVAHISSANTES EN MER MEDITERRANEE

Présenté par
Abdellatif BAYED

Unité d'Océanologie Biologique
Institut Scientifique
Université Mohammed V – Agdal
B.P. 703, Agdal
10000 Rabat - Maroc

La façade méditerranéenne du Maroc longue d'environ 600 km se trouve à l'extrême ouest de la Méditerranée et est contiguë avec le détroit de Gibraltar par lequel les eaux atlantiques de surface pénètrent dans ce bassin. En plus du contingent d'espèces atlanto-méditerranéennes déjà présentes, beaucoup d'espèces d'origines atlantiques entrent, s'installent et se développent en populations viables et sont nouvellement signalées dans plusieurs secteurs de la mer Méditerranée. Au Maroc, les activités aquacoles entreprises dans la lagune de Nador ont permis l'introduction d'espèces commerciales non-indigènes comme l'huître japonaise *Crassostrea gigas* et la crevette japonaise *Penaeus japonicus*. La première est originaire d'une souche produite en éclosérie dans la lagune atlantique de Oualidia et la seconde provient d'Europe. D'autres espèces de Méditerranée sont élevées aussi dans cette lagune : la Dorade royale *Sparus aurata*, le Bar européen *Dicentrarchus labrax*, le Bar tacheté *D. punctatus*, l'huître plate *Ostrea edulis*, le Sar à museau pointu *Diplodus puntazzo* et la Palourde européenne ou Clovisse *Tapes decussata*. Les espèces non-indigènes qui se sont installées dans la lagune (*C. gigas* et *P. japonicus*) ne semblent pas être des formes envahissantes et ne dominent pas les espèces indigènes. En mer ouverte, des prospections sont nécessaires en Méditerranée marocaine pour mesurer à sa juste valeur le niveau de présence des espèces non-indigènes qui se sont installées dans cette région de la mer d'Alboran.

Brief report given by the representative of Slovenia within the framework of the opening session (Agenda item1)

THE ACTIVITIES OF SLOVENIA TO CONTROL THE INTRODUCTION OF NON-INDIGENOUS SPECIES IN THE MARINE ENVIRONMENT

Presented by
Matej DAVID

Biodiversity, as well as integrity, of aquatic ecosystems of Slovenia, are being challenged by the introductions of non-indigenous organisms via natural way as well as by human activities. Nevertheless, no case of the introduction of non-indigenous organisms in our sea that would badly affect the human health, environment or economy has been recorded to date.

At present, the activities of Slovenia are focused on the maritime transport as a vector. On 1 July 2001 the **national research project** "*Harmful introductions and Ballast Water Management in the Slovenian Sea*" started. The project is financially supported by the Ministry of Education, Science and Sports of the Republic of Slovenia and Port of Koper, who are also beneficiaries. The **main research organisation** is the Faculty of Maritime Studies and Transportation (University of Ljubljana, Slovenia). The project will terminate on 31 December 2003.

The main aims of the project are:

- to research the extent of the ballast water "phenomenon" in the Slovenian sea with the emphasis on the Port of Koper; and
- to propose guidelines for the prevention of harmful introductions, according to the international and Slovenian legislation and the organisation of parties involved in the maritime transport in Slovenia.

Since 1 October 2001 all ships calling to the Port of Koper are required (on voluntary basis) to submit Ballast Water Reporting Form (BWRF) to the Port Authority. The origin and quantity of ballast water released in the Port of Koper has been assessed. A ballast water sampling and analysing protocol was prepared. The protocol includes new sampling methods and equipment, which were especially developed/designed to facilitate the shipboard sampling. The shipboard sampling commenced.

According to the Draft general guidelines for preparing action plans (SAP BIO), the draft text of the **National action plan** on Biological invasions and possible effects on biodiversity was prepared by the Marine Biology Station (National Institute of Biology, Slovenia).

Dealing with the introduction of non-indigenous species is a very complex issue, especially in the case of ballast water. Nature on one side demands our soon response, but on the other side, our knowledge is far from reliable. Therefore, further research work should be supported, and this should be done on the regional and concerted action approach.

Brief report given by the representative of Spain within the framework of the opening session (Agenda item1)

Presented by
Laura CAPDEVILA

During the last decades several species have appeared in the Spanish Mediterranean Sea. These species have been accidentally introduced. Actions have focused on the marine chlorophyceae *Caulerpa taxifolia*, now settled in the Balearic Islands. At present, the control and the eradication of this species is carried out by means of divers (manual control) and suction bombs. Furthermore, an alert network has been set in the Balearic Island and in the Spanish east coast to prevent the appearance of new focuses. Local governments have written out and enforce laws prohibiting its sale and distribution in areas of potential risk (Decree 125/1995 and Decree 257/1992). Public awareness has been made by means of alert campaigns directed to fishermen, divers, etc.

A monitoring system works in fishing-related marine reserves. This, although not at a specific level, could alert of new introductions.

A public awareness campaign on invasive alien species has been carried out at a national level. This campaign also includes the problem of marine invasive species.

These initiatives have been carried out by central, regional and local Iberian governments and NGO's.

The Government of the Balearic Islands is currently developing a project. The project consists of a database of the species introduced in the Balearic Islands. Additionally it sets up criteria to control them.

In 2003, the First National Conference on Exotic Invasive Species will be held in León (Spain). The conference will include a Workshop on the management of invasive alien species in insular ecosystems.

Brief report given by the representative of Syrian Arab Republic within the framework of the opening session (Agenda item1)

REPORT OF SYRIA ON INVASIVE SPECIES

Presented by
Dr Amir IBRAHIM

Syrian coastline is relatively short (182Km in length) and the continental shelf is rather small (about 900 Km²). The main features of coastal waters in regard of Biodiversity and species introduction are:

1. Continuous increase in salinity level (up to 40%) because of low input of freshwater due to dams building on coastal rivers, and consequently:
 - i. Disappearance of some local valuable species which could not tolerate high salinity levels,
 - ii. Migration or introduction of species of higher tolerance to salinity, where 34 species of fish, 29 of mollusks and 12 of crustacea were recorded; the majority of these are from the Red Sea.
2. Unproductive water (due to low input of nutrients), which can not accommodate or sustain high level of biodiversity.
3. Continuous increase in water temperature (Global).

Some measures have already been taken to control species introduction:

1. Improving the quality of coastal habitat by allowing more water to flow into the Sea.
2. Renewing the previous legislation to take into account biodiversity conservation.
3. A ministerial decree was imposed to cease the discharge of ballast water without proper treatment for chemical and biological pollution.
4. The national biodiversity strategy and action plan was issued, and strict measures were imposed to eradicate harmful foreign species and to stop introduction of species for aquaculture. Now, 7 foreign fish species have been introduced for freshwater farming and, till now, no single species has been introduced for Mariculture.

Brief report given by the representative of Tunisia within the framework of the opening session (Agenda item1)

ETAT DES CONNAISSANCES SUR LES ESPECES EXOTIQUES EN TUNISIE ET EFFORT DEPLOYE POUR EN DIMINUER LES EFFETS NEGATIFS

Présenté par
Mohamed Nejmeddine BRADAI

La Méditerranée, zone de transition entre l'océan Atlantique à travers le détroit de Gibraltar et l'océan indien via la Mer Rouge et le canal de Suez, subit, suite à des perturbations de plusieurs ordres que connaît à la fin du 19^{ème} et au cours du 20^{ème} siècle, des modifications floristiques et faunistiques importantes.

Les côtes tunisiennes, à cheval sur les bassins occidental et oriental de la Méditerranée, et particulièrement la région du golfe de Gabès subissent les conséquences de toutes ces perturbations et des modifications floristiques et faunistiques y sont apparus. Nous avons, en effet, recensé plusieurs espèces végétales et animales non indigènes sur les côtes tunisiennes et particulièrement dans la région du golfe de Gabès qui sont arrivées et de la mer rouge et de l'Atlantique principalement d'une façon spontanée ou dans les eaux de ballast. Ces espèces sont dites également exotiques. La liste actuelle comporte 22 espèces (14 de la mer rouge et 8 de l'Atlantique): 2 végétaux, 12 poissons, 3 mollusques et 5 crustacés dont plusieurs se sont bien acclimatés aux conditions de nos côtes et certaines sont exploitées actuellement d'une façon commerciale.

Par ailleurs, d'autres espèces ont été introduites pour les besoins de l'aquaculture en eaux marines (le bivalve :*Crassostrea gigas*) et de l'élevage et/ou la lutte contre l'eutrophisation ou également pour fourrage dans les eaux douces (9 poissons).

Soucieux de la prévention de la biodiversité marine, la Tunisie, à travers surtout l'INSTM, fait preuve de vigilance à l'encontre des phénomènes d'introduction (naturels ou anthropiques) de toute espèce animale ou végétale dans les écosystèmes littoraux tunisiens. A cet effet et bien avant l'apparition de *Caulerpa taxifolia* en Tunisie, deux axes de prévention ont été développés: (1) campagne de prospection des sites jugés sensibles (2) la distribution de 10.000 dépliants de sensibilisation et d'appel à signalisation auprès des pêcheurs et des utilisateurs de la mer. Une commission nationale est créée pour suivre l'évolution de cette algue et diminuer sa propagation et plusieurs axes de recherche concernant cette espèce ont été développés.

D'autres espèces font l'objet actuellement d'études biologiques et écologiques pour en savoir plus sur leur statut et ceci dans le cadre de mastères et de thèses. Un programme ambitieux sur les espèces exotiques, soumis au gouvernement, vise à mieux comprendre les causes de l'introduction d'espèces et génotypes exotiques et ses incidences sur la diversité biologique. Dans ce programme de recherche, nous nous intéressons principalement aux volets suivants :

- Inventaires / répartition ;
- Suivi de l'invasion ;
- Impact sur les espèces indigènes et la diversité biologique d'une façon générale.

Brief report given by the representative of Turkey within the framework of the opening session (Agenda item1)

**UNEP, MAP, RAC/SPA
ACTION PLAN ON THE INTRODUCTION OF SPECIES AND ON INVASIVE
SPECIES IN THE MEDITERRANEAN SEA**

Presented by
Prof. Dr. Sukran CIRIK

The Turkish Ministry of Environment has started research projects and working groups since 2000, to constitute the Action Plans for conserving the biological diversity and non-indigenous species. These studies have still been continuing.

At recent years lots of alien-invasive benthic and pelagic species introduced and expanded in around the Turkish seas where Turkey has more than 8000 km long shoreline, in different ways observed by the researchers. To propose of determining the ecological and economical effects of these species, to control their introduction, to make legislative arrangements and to improve eradication methods, the Action Plans have been constituted and applied. The Ministry of Environment has also started to constitute a data bank about the inventory of species and distribution of alien-invasive species in collaboration with the Turkish Scientific and Technical Research Council (TUBITAK).

Efforts of the informative meetings have been emphasized in order to improve the public awareness and collaboration as well as the administrators, and the various documents have been prepared for this purpose. Moreover, a workshop has been proposed about the Invasive *Caulerpa* species in Turkey (2003) under the sponsorship of UNESCO, to improve the regional collaboration and communication and to provide a workshop

Appendix IV

DRAFT ACTION PLAN CONCERNING SPECIES INTRODUCTIONS AND INVASIVE SPECIES IN THE MEDITERRANEAN SEA

DRAFT ACTION PLAN CONCERNING SPECIES INTRODUCTIONS AND INVASIVE SPECIES IN THE MEDITERRANEAN SEA

INTRODUCTION

1. The Contracting Parties to the Barcelona Convention, as part of the Mediterranean Action Plan, give priority to the conservation of the marine environment and to the components of its biological diversity. This has been confirmed on several occasions, particularly by the adopting (Barcelona, 1995) of the new Protocol on specially protected areas and biological diversity in the Mediterranean (SPA Protocol) and of its Annexes.
2. Elaborating and implementing action plans to confront the threats hanging over the elements that make up biological diversity is an effective way of guiding, coordinating and stepping up the efforts made by the Mediterranean countries to safeguard the region's natural heritage.
3. The SPA Protocol invites the Contracting Parties to take "all appropriate measures to regulate the intentional or non-intentional introduction of non-indigenous or genetically modified species into the wild and prohibit those that may have harmful impacts on the ecosystems, habitats or species".
4. As to those species which have already been introduced, the SPA Protocol stipulates that when a scientific assessment has revealed that these are causing or are likely to cause harm to ecosystems, habitats or species, the Contracting Parties strive to implement all possible measures to eradicate them.
5. The Convention on Biological Diversity calls in its Article 8 (h) on each Contracting Party, as far as possible and as appropriate, to prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.
6. The introduction of non-indigenous species into Mediterranean coastal waters has recently increased, and certain of these have proved to be invasive. Whether intentional or non-intentional, the introduction of a non-indigenous species can cause often irreversible damage to the receiving ecosystem, with harmful effects both ecologically and socio-economically.

7. [As well as the entry of species through the Suez Canal (Lessepsian migration), factors linked to geological history and the natural link with the Atlantic (Strait of Gibraltar), the main known paths of species introduction into the Mediterranean Sea are¹:
- species being transported by ships' hulls (fouling)²
 - the discharge of ballast water³
 - live fishing bait and the trade in living marine species
 - scientific research⁴
 - aquaculture⁵
 - the handling of aquarium species.]

¹ Other less important causes of marine species introduction into the Mediterranean Sea are reported (sea birds, epibiontes on migratory animals and on drifting plastics, boat anchors, indigestible eggs and spores in predator stomachs, etc.).

² Several species of alga and of marine invertebrate cling to ships' hulls and may thus travel over long distances and settle in new zones. Regular introductions happen all around the world through the movement of ships.

³ Ballast water is used to weight and thus stabilise ships, especially during trips when they are empty. In the past, ships were weighted with solid materials (stones, sand etc.), but for several years now sea water has been commonly used for all modern ships. Although most species contained in the ballast water are no longer alive when they reach the place where the ballast is discharged, or do not survive in the environment they are poured into, some of these species do manage to settle and form viable populations.

⁴ This is probably a vector that is not very common but that could be in the future as a consequence of the increase of international collaborative projects in the Mediterranean Basin.

⁵ Importing live animals for aquaculture purposes is the main way of intentional introduction of marine species into the Mediterranean. It is impossible in practice to avoid species introduced for aquaculture purposes escaping from their breeding facilities and forming viable populations in the natural environment. Moreover, several cases of incidental introduction have been reported for those species that accompany species imported for the purposes of aquaculture.

7. [It is recognized that aquatic organisms enter the Mediterranean from adjacent seas without human intervention through natural paths¹ (e.g. the Strait of Gibraltar). It is also recognised that the fauna and flora of the Mediterranean Sea are mainly of Atlantic origin. The entry of species into the Mediterranean Sea has been increasing over the last few decades because of various factors, mainly of anthropic origin. The main known vectors of species introduction into the Mediterranean Sea are:

- Entry of Red Sea organisms, by natural means or phoresy, through the Suez Canal, built in the 19th century
- Shipping (ballast water² and sediments, fouling³)
- Aquaculture⁴ (both marine and brackish water)
- Trade in live marine organisms (e.g. aquarium activities, fishing bait) and scientific research⁵.

The same vectors may facilitate secondary introductions within and outside the Mediterranean.]

NB: The text of paragraph 7 presented here in this box represents the text prepared during the Meeting as an alternative to the paragraph 7 contained in the draft Action Plan suggested by the Secretariat. However, it was not possible to reach a consensus about the wording of paragraph 7. Therefore, it was decided to submit both versions of paragraph 7 to the next Meeting of NFPs for SPAs.

8. Although only some of the non-indigenous species succeed in establishing viable populations, the environmental consequences are, in many cases, negative for the Mediterranean indigenous species. The invasive species are seen as being among the main threats to marine biological diversity in the Mediterranean. It is imperative to take immediate steps to prevent the introduction of non-indigenous species, control the spread of those already introduced, and endeavour to mitigate the damage they cause to the marine ecosystem. The present Action Plan is being elaborated on the basis of the data available; it will be adapted, if necessary, as and when new data is available.
9. When implementing the present Action Plan, Parties will refer to the definitions and guiding principles set out in Decision VI/23, adopted within the CBD framework, until these are submitted for in-depth discussion at the workshop mentioned in paragraph 21 below, with a view to arriving at guiding principles and approaches to be included in the guidelines provided for in paragraph 20 of the Action Plan.

10. The actions advocated by the present Action Plan are to be carried out over a three-year period, starting from when the Action Plan is adopted by the Contracting Parties. At the end of this period, RAC/SPA will prepare a report on the progress so far made in implementing the advocated actions, and will submit this to the National Focal Points for SPAs, who will make follow-up suggestions to the Parties.
11. Considering the world-wide scope of the issue of non-indigenous species introduction, it is important that the implementation of the present Action Plan be done in consultation and collaboration with the initiatives undertaken in this field in other regions and/or by international organisations.

A. OBJECTIVES OF THE ACTION PLAN

12. The main objective of the present Action Plan is to promote the development of coordinated measures and efforts throughout the Mediterranean region in order to prevent, control and monitor the effects of species introduction, particularly by:
 - strengthening the capacity of the Mediterranean countries to deal with the issue of non-indigenous species introduction
 - strengthening the institutional and legislative frameworks at the level of the countries of the region
 - collecting reliable and pertinent scientific data that can be used for decision-making where necessary
 - setting up mechanisms for cooperation and the exchange of information between the states of the region
 - elaborating guidelines and any other technical documentation.

B. PRIORITIES

B.1 At regional level

13. Considering the breadth and complexity of the issue of non-indigenous species introduction, priority at regional level should be given to:
 - coordinating and supporting the compiling and regular updating of Mediterranean-wide lists of non-indigenous species⁶, including information on their ecology, biology and habitats. Lists should distinguish between species that are harmful to human health, invasive or both, and provide information on such a classification;
 - elaborating and adopting at regional level guidelines intended to assist the relevant national authorities;
 - coordinating the actions taken by neighbouring states to prevent and control the introduction of non-indigenous species;
 - supporting cooperation at international level.

⁶ The lists of exotic species being compiled within the framework of CIESM and any other recognised publication could be used as reference and a source of information.

B.2 At national level

14. Considering the lack of the data and knowledge necessary for risk assessment and the implementation of preventive and control actions, priority at national level should be given to:
- encouraging all necessary actions (e.g. research work, data collection, monitoring, etc.) aimed at improving the available knowledge;
 - coordinating the actions that are necessary for the regular provision of supplementary information for the national and Mediterranean-wide reference lists of non-indigenous species;
 - supporting information exchanges and concerted actions at regional level;
 - encouraging the implementation of scientifically-backed regionally-harmonised measures of prevention and control.

C. ACTIONS REQUIRED TO ATTAIN THE OBJECTIVES OF THE ACTION PLAN

C.1 At national level

C.1.1. Data collection

15. The Contracting Parties are invited to assess the situation as regards the introduction of marine species and compile the available information to prepare national reports using the relevant forms available within the framework of the international organisations. To this end, they will be assisted by RAC/SPA, if necessary. The national reports will particularly deal with:
- known or potential vectors for the introduction of marine species into the national territory
 - steps taken at national level to prevent and control the introduction of marine species
 - the national institutional framework that governs the controlling of species introduction
 - inventorying the non-indigenous marine species reported in the national territory
 - the relevant documentation available
 - participation at pertinent international initiatives, including joining international agreements and bilateral cooperation.
16. The Parties are requested to prepare programmes for data collection and monitoring, particularly of:
- the presence of non-indigenous marine species and the state of their population trends, including those used in aquaculture
 - the impact of non-indigenous species on the indigenous biodiversity⁷
 - the origin of ballast water discharged into their territorial waters.

⁷ (E.g.: ecology, biology, local distribution, etc.)

C.1.2. Legislation

- 17.** Those Contracting Parties which have not yet enacted national legislation for controlling the introduction of marine species must do so as quickly as possible. All the Contracting Parties are strongly recommended to take the necessary steps to express in their national laws the provisions of the pertinent international treaties and guidelines and codes adopted on the subject within the context of international organisations⁸.

C.1.3. Institutional framework

- 18.** A mechanism should be set up, if possible at the level of each country, to promote and coordinate the following actions:
- inventorying paths of introduction
 - compiling an inventory of introduced species
 - establishing a directory of relevant specialists and organisations
 - setting up a group of experts who will be responsible for assessing suggestions for introduction, and analysing risks and possible consequences
 - identifying and inventorying public and private actors whose activity could introduce marine non-indigenous species
 - developing relevant training programmes
 - strengthening and where necessary setting up systems to control the intentional import and export of non-indigenous marine species
 - developing and implementing risk-assessment techniques
 - promoting relevant scientific research
 - cooperating with the concerned authorities in neighbouring states regarding the detection of introduced species and risk assessment
 - participating in international initiatives on invasive species
 - developing programmes to raise the awareness of the general public and target groups, including decision-makers, concerning the risks associated with species introduction
 - developing monitoring programmes for hotspots (ports, coastal lagoons, aquaculture sites, sensitive zones, etc.).

⁸ Many organisations have elaborated codes, guidelines or other tools providing technical and legal recommendations for the better control of species introductions and mitigation of their negative impacts. Those tools which are most pertinent for the Mediterranean region are:

- Guiding principles for the prevention, introduction and mitigation of impacts of alien species (elaborated within the framework of the Convention on Biological Diversity)
- Recommendation no. 57 on the Introduction of Organisms belonging to Non-Native Species into the Environment (adopted within the framework of the Bern Convention)
- The IUCN Guidelines for the prevention of biodiversity loss caused by alien invasive species
- The Code of Practice on the Introductions and Transfers of Marine Organisms (developed by the International Council for the Exploration of the Sea)
- Guidelines for preventing the introduction of unwanted aquatic organisms and pathogens from ships' ballast water and sediment discharges (adopted within the framework of the IMO)
- The precautionary approach concerning the introduction of species (developed by the FAO).

C.1.4 National Plans

- 19.** To ensure more efficiency in the measures envisaged in the implementation of this Action Plan, Mediterranean countries are invited to establish national plans to control the introduction of non-indigenous marine species and to mitigate their negative impact. Each national plan, taking into account the concerned country's specific features, must suggest appropriate institutional and legislative measures. The national plan shall be based on the available scientific data and will include programmes for (i) the collection and regular updating of data, (ii) training and refresher courses for specialists, (iii) awareness-raising and education for the general public, actors and decision-makers and (iv) coordination and collaboration with other states. The national plans must be brought to the attention of all concerned actors and, when possible, coordinated with the relevant national plans.

C.2 At regional level

C.2.1 Data collection and dissemination

- 20.** With a view to providing the concerned national authorities with the necessary scientific and technical documentation, the two following tools will be elaborated, working hand in hand with the Mediterranean experts and international organisations:
- guidelines for controlling the vectors of introduction into the Mediterranean of non-indigenous species and invasive marine species
 - a guide for risk analysis assessing the impacts of the introduction of non-indigenous species.
- 21.** A workshop made up of experienced Mediterranean scientists should convene to review the available data on non-indigenous species in the Mediterranean, identifying the most important taxonomic and geographic gaps and suggesting a programme to rectify these. The workshop should also have a session that examines the different vectors of non-indigenous species introduction and proposes possible control measures for their prevention. The guidelines and the guide referred to in the above paragraph 20 will be reviewed during the workshop.
- 22.** A regional mechanism for collecting, compiling and circulating information on invasive non-indigenous species should be set up as part of the present Plan and harmonised with the Mediterranean Clearing House Mechanism developed in collaboration with the CBD Secretariat. It will in particular include:
- procedures for notifying the fact that non-indigenous marine species have been detected in the Mediterranean
 - a database on invasive marine species (taxonomy, ecology, affected ecosystems or species, means of fighting the problem, specialists, etc.)

- systems for circulating information on the impacts due to the introduction of species and on the approaches to prevention and management
- a procedure for the rapid circulation of information on new introductions of species
- links of cooperation and exchange with the main pertinent world or regional initiatives.

C.2.2 Regional project on fouling and ballast water and sediments

23. Given the importance of shipping-mediated introductions of non-indigenous species into the Mediterranean, it is strongly recommended that within the context of the present Action Plan, a regional project be developed to overcome gaps for the Mediterranean countries, and strengthen the capacities of the countries to reduce the transfer of aquatic organisms via ships' ballast water and sediments and hull fouling. For elaborating and implementing the regional project, it is necessary to work closely with the IMO and the joint GEF-UNDP-IMO ballast water management programme.

C.2.3 Training

24. To support implementation of the present Action Plan, a regional training session should be organised in collaboration with the concerned international organisations. In particular, it will deal with the main following themes:

- The legislative and institutional aspects related to controlling the introduction of non-indigenous marine species
- Assessing the risks linked to the introduction of non-indigenous species and to the means of fighting against and eradicating them
- Management of ships' ballast water with a view to minimising transfers of marine organisms
- Identification of non-indigenous species.

C.2.4 Public education and awareness

25. With a view to promoting the Mediterranean countries' national programmes for raising the awareness of the general public and target groups, including decision-makers, about the risks associated with introducing non-indigenous marine species into the Mediterranean, it is recommended that RAC/SPA, in collaboration with the relevant national authorities and international organisations, prepare brochures, posters and other educational and awareness materials. These will be made available to the National Focal Points for SPAs for them to circulate in their respective countries.

D. REGIONAL COORDINATION

- 26.** Regional coordination of the implementing of the present Action Plan will be guaranteed by the Mediterranean Action Plan's (MAP) Secretariat through the Regional Activity Centre for Specially Protected Areas. The main functions of the coordinating structure shall consist in:
- taking in hand the implementation of those actions required at regional level to attain the present Action Plan's objectives (Section C.2 above)
 - insofar as its means permit, assisting the Contracting Parties in implementing the actions required at national level to attain the present Action Plan's objectives (Section C.1 above)
 - identifying hotspots as regards non-indigenous species (at geographic and species level)
 - regularly reporting to the National Focal Points for SPAs about the implementation of the present Action Plan, and preparing the report mentioned in paragraph 10 above
 - collaborating with the concerned organisations and endeavouring to ensure that the Mediterranean region is involved in the pertinent international and/or regional initiatives;
 - promoting exchanges among Mediterranean specialists.

E. PARTICIPATION IN THE IMPLEMENTATION

- 27.** Implementing the present Action Plan is the province of the national authorities of the Contracting Parties. The concerned international organisations and/or NGOs, laboratories and any organisation or body are invited to join in the work necessary for implementing the present Action Plan. In addition to collaborating and coordinating with the Secretariats of the relevant Conventions, RAC/SPA should invite IMO and FAO to join and contribute to the implementation of the present Action Plan. It will set up a mechanism for regular dialogue between the participating organisations and, where necessary, organise meetings to this effect.

Annex
IMPLEMENTATION TIMETABLE

Action	Deadline*
1. Developing programmes to raise the awareness of the general public and target groups, including decision-makers, concerning the risks associated with species introduction (see paragraph 18 of the Action Plan)	As soon as possible
2. Setting up a mechanism to promote and coordinate the actions listed in paragraph 18	6 months
3. Preparation of National Reports (see paragraph 15 of the Action Plan)	9 months
4. Inventorying introduction vectors (see paragraph 18 of the Action Plan)	9 months
5. Elaborating the regional project on fouling, ballast water and sediment (see paragraph 23 of the Action Plan)	9 months
6. Elaborating education and awareness material (see paragraph 25 of the Action Plan)	9 months
7. Establishing a directory of relevant specialists and organisations (see paragraph 18 of the Action Plan)	1 year
8. Setting up a group of experts who will be responsible for assessing suggestions for introduction, and analysing risks and possible consequences (see paragraph 18 of the Action Plan)	1 year
9. Convening the workshop referred to in paragraph 21 of the Action Plan	1 year
10. Launching the procedures for enacting or strengthening national legislation governing the control of non-indigenous species introduction (see paragraph 17 of the Action Plan)	18 months
11. Organising the regional training session (see paragraph 24 of the Action Plan)	18 months
12. Developing programmes for data collection and monitoring (see paragraph 16 of the Action Plan)	2 years

* Starting from when the Action Plan is adopted by the Contracting Parties

IMPLEMENTATION TIMETABLE (continued)

Action	Deadline[*]
13.Strengthening and where necessary setting up systems to control the intentional import and export of non-indigenous marine species (see paragraph 18 of the Action Plan)	2 years
14.Developing and implementing risk-assessment techniques (see paragraph 18 of the Action Plan)	3 years
15.Preparing the Guidelines for controlling the vectors of non-indigenous species and invasive marine species introduction into the Mediterranean (see paragraph 20 of the Action Plan)	2 years
16.Preparing the Guide for risk analysis and impact assessment as regards the introduction of non-indigenous species (see paragraph 20 of the Action Plan)	2 years
17.Setting up the Regional Mechanism for collecting, compiling and circulating information on invasive non-indigenous species (see paragraph 20 of the Action Plan)	2 years
18.Compiling an inventory of introduced species. Identifying and inventorying public and private actors whose activity could introduce marine non-indigenous species (see paragraph 18 of the Action Plan)	3 years
19.Elaborating the National Plans (see paragraph 19 of the Action Plan)	3 years
20.Preparing the report on the progress made in implementing the Action Plan (see paragraph 10 of the Action Plan)	3 years

* Starting from when the Action Plan is adopted by the Contracting Parties