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**REGIONAL PROGRAMME ON MARINE AND COASTAL INVASIVE
SPECIES IN THE EAST ASIAN SEAS REGION**

As Approved by 20th IGM of COBSEA

Ha Long City, Viet Nam
2-5 November 2009



The Coordinating Body on the Seas of East Asia (COBSEA)

**REGIONAL PROGRAMME ON MARINE AND COASTAL
INVASIVE SPECIES IN THE EAST ASIAN SEAS REGION**

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GLOSSARY

Alien species: species that have been intentionally or unintentionally introduced to areas outside of their natural ranges (synonyms = non-native, non-indigenous).

Ballast water: any water and associated sediment used to manipulate the trim and stability of any vessel (including modern ocean racing yachts).

Biofouling: growth of sessile algae and animals (including those nestled therein) on submerged structures, especially vessel hulls, artificial underwater structures, and water intake pipes.

Endemic : a species with a native distribution restricted to the bioregion/s of interest as a result of one of several biogeographical mechanisms.

Hull-fouling: the accumulation of unwanted organisms on the hulls of vessels.

Introduction: the intentional or unintentional escape, release, dissemination, or placement of an alien species into an area outside of its natural range (past or present) as a result of human activity. This movement can be either within a country – between eg provinces or ecoregions - or between countries.

Invasive alien species (IAS): species that have been intentionally or unintentionally introduced to areas outside of their natural ranges and which subsequently establish and spread with serious economic, environmental and health impacts.

Mariculture: the farming or culture of marine or estuarine species.

Ornamental species: decorative plants and animals (including GMO's) with unusual or eye-catching features that are selectively bred, imported or modified for display in gardens, parks, ponds or aquaria.

Pathogens: disease-causing micro-organisms.

Pathway: the mechanism, purpose or activity that facilitates the entry or spread of a pest; for example, shipping, travel, trade.

Vectors: the physical means, agent or carrier - living or non-living - carrier that transfers organisms or their propagules intentionally or unintentionally from one place to another. For example, ship's hulls, ballast water, fishing equipment etc.

LIST OF ABBREVIATIONS

AAPQIS:	Aquatic Animal Pathogen and Quarantine Information Service
APEC:	Asia Pacific Economic Community
ASEAN :	Association of South East Asian Nations
CBD:	Convention on Biological Diversity
COBSEA:	The Coordinating Body on the Seas of East Asia
COP:	Conference of Parties
EAS/RCU:	East Asian Seas Regional Coordinating Unit
FAO:	Food and Agriculture Organisation
GISP :	Global Invasive Species Programme
HABs:	Harmful Algal Blooms
IAS:	Invasive Alien Species
ICES:	International Council for Exploration of the Sea
IMO:	International Maritime Organisation
IOC/WESTPAC:	Intergovernmental Oceanographic Commission – Western Pacific Region
IUCN:	The World Conservation Union
LME:	Large Marine Ecosystem
MEPC:	Marine Environment Protection Committee (of the IMO)
MIS:	Marine (and Coastal) Invasive Species
NACA:	Network of Aquaculture Centres of Asia
NAP:	National Action Plan
PEMSEA:	Partnerships in Environmental Management for the Seas of East Asia
SEAHAB:	South East Asia Harmful Algal Blooms (newsletter)
UNEP:	United Nations Environment Programme
UNESCO:	United Nations Educational, Scientific and Cultural Organisation

1. INTRODUCTION AND BACKGROUND

Invasive alien species (IAS) are species that have been intentionally or unintentionally introduced to areas outside of their natural ranges and which subsequently establish and spread with serious economic, environmental and health impacts. At the same time, indigenous species may also become invasive, usually when environmental conditions have changed. In the marine context, there are a variety of terms for invasive species, but for purposes of this document, they will be referred to as marine and coastal invasive species (MIS)¹.

IAS are now generally recognized as one of the greatest threats to biodiversity globally and in marine and coastal environments have been identified as one of the four greatest threats to the world's oceans along with:

- Land-based sources of marine pollution
- Over-exploitation of living marine resources
- Physical alteration/destruction of marine habitats.

Marine invasive species have now been documented in the majority (84%) of the world's 232 marine ecoregions, with particularly high levels of invasion in Northern California, the Hawaiian Islands, the North Sea, and the Eastern Mediterranean (Molnar et al, 2008)². Moreover, the anticipated changes in the physical and chemical characteristics of the oceans and seas as a consequence of climate change are likely to favour species which are adaptable and opportunistic – characteristics which are typical of invaders.

Many of the reported MIS have had disastrous economic and environmental consequences, and once they have become established, they are virtually impossible to control or eradicate. The impacts of marine invasive species include:

- Ø Ecosystem changes: original species composition and/or ecological processes may be altered by the invading species.
- Ø Economic impacts: fisheries, coastal industry and other commercial activities and resources may be disrupted by the invading species resulting in loss of revenue and/or removal costs.
- Ø Public health impacts: people may fall ill or even die from the consumption of, or direct exposure to introduced toxic organisms (Harmful Algal Blooms – HABs), diseases and pathogens.

¹ Although the intention is that this regional programme will focus on alien invasives, a number of countries have indicated that they have indigenous marine species which are invasive. Of particular concern are some disease organisms which impact on aquaculture production. MIS can therefore be considered to include both alien and indigenous marine and coastal species. See the Glossary of Terms for other terms and definitions.

² Molnar, J.L., Gamboa, R.L., Revenga, C., and Spalding, M. (2008). Assessing the global threat of invasive species to marine biodiversity. *Front Ecol Environ* 2008;6, doi: 10.1890/070064. (www.frontiersinecology.org).

The comb jelly, *Mnemiopsis leidyi*, for example, caused losses of around \$ 500 million a year in the Black and Azov Seas. *Mnemiopsis* is endemic to temperate to subtropical estuaries along the North and South American Atlantic coast and is thought to have been transferred to the Black Sea via ship's ballast water. It was first recorded in the Black Sea in 1982, where it became well established, occurring in massive numbers, later spreading to the Azov, Marmara, Eastern Mediterranean, and Caspian.

Mnemiopsis feeds on the same zooplankton as many of the commercial fish species in the area, so the invasion had a devastating impact of fisheries such as anchovy, Mediterranean horse mackerel and sprat, and kilka in the Azov and Caspian. Landings of anchovy, for example, dropped to one-third of their previous levels, causing many fishermen to abandon fishing. The decrease in zooplankton caused by *Mnemiopsis* also had impacts on the food web, causing an increase in phytoplankton, and, with the decrease in zooplanktivorous fish, a decline in predatory fish species and seals. The subsequent accidental introduction into the Black Sea of another comb jelly – *Beroe cf ovata* – which is a predator of *Mnemiopsis*, has resulted in a major decline of *Mnemiopsis* there, and a substantial recovery of the ecosystem.³

While at present there is relatively little information on marine invasive species in the East Asian Seas region, more than 70 alien species have been recorded. Data on economic impacts is sparse, although it was reported that the False mussel (*Mytilopsis sallei*) causes about RMB ¥ 5,000,000 direct economic loss per year in China through fouling on the shells of commercially important mussels and oysters⁴. Similarly, the North Pacific seastar (*Asterias amurensis*) was estimated to have caused around \$AUD 1 million loss to the scallop industry in Tasmania in 2000 alone, and has the potential to impact other shellfish fisheries – both wild and cultured.

Alien species may be introduced into new geographic areas intentionally or unintentionally via a variety of pathways, including shipping, aquaria, mariculture, canals and even marine debris. Although shipping has historically been regarded as the most important of these pathways, in fact the relative importance varies from one region – or sub-region – to another.

For example, a recent analysis by Molnar et al (2008)², drawing on information from over 350 databases and other sources, showed that for the 329 marine invasive species considered, 69% were introduced by shipping. Other important pathways included aquaculture (41%), canals (17%), the aquarium trade (6%), and live seafood trade (2%)⁵. Of the 205 species introduced via shipping – and for which sufficient information was available – 39% were introduced by hull-fouling, 31% via ballast water, and the remainder by either or both.

³ Shiganova, T. & Dumont, H. (in prep.) Non-native species in the southern seas of Eurasia: distribution, impacts, pathways and vectors.

⁴ Responses received to questionnaire circulated to COBSEA Focal Points.

⁵ The numbers total more than 100% because some species have been introduced by more than one vector. (Molnar et al, 2008).

In contrast, Galil (2008)⁶ reported that the majority of alien marine species recorded in the Mediterranean were introduced via the Suez Canal (54%), another 10% through the canal but assisted by vessels, 21% directly by vessels, and the remainder via aquaculture, with some secondary spread by vessels. Further, that this pattern varied within the Mediterranean from the west to the east, with mariculture being the main source in the west (42%), and the Suez Canal in the east (81%).

Given the high levels of shipping and mariculture in the East Asian Seas Region, it is highly likely that there are far more introduced species present than have been recorded and a thorough assessment of both alien species and pathways should be undertaken as a matter of urgency.

At the global level, invasions such as that of the comb jelly have led to an increased awareness and understanding of the need to prevent and manage invasive species and there are now numerous international initiatives working towards this end. Of particular importance in the marine context are:

- Ø The activities of the International Maritime Organisation (IMO) on ballast water including the development and adoption of the Ballast Water Convention and associated guidelines as well as the GloBallast and GloBallast Partnerships Programmes;⁷
- Ø A more recent initiative by the IMO on hull-fouling;
- Ø The development of a Joint Global Work Programme on marine invasives under the umbrella of a partnership between the CBD, GISP, and the UNEP Regional Seas Programme.⁸

While global co-operation and coordination is crucial for effective management of invasive species, implementation for the most part takes place at national and regional levels and the individual regional seas programmes – and their member countries - provide ideal platforms for such activities. In this case, the intention is that while UNEP/COBSEA will take the lead in the preparation and implementation of the programme, it will do so in collaboration with relevant international and regional organizations, programmes and projects.

At the international level, links will be established with the IMO/GloBallast Partnerships Programme, the CBD, FAO, GISP and IUCN.

⁶ Galil, B.S. (2008) Taking stock: inventory of alien species in the Mediterranean sea. *Biological Invasions*.

⁷ <http://globallast.imo.org>

⁸ UNEP/CBD/SBSTTA/11/INF

2. THE COBSEA REGION

The Coordinating Body on the Seas of East Asia (COBSEA) consists of ten member countries: Australia, Cambodia, the People's Republic of China, Indonesia, the Republic of Korea, Malaysia, the Philippines, Singapore, Thailand and Vietnam. COBSEA was formed in 1981 as a UNEP Regional Seas Programme to oversee the implementation of the "Action Plan for the Protection and Sustainable Development of the Marine and Coastal Areas of the East Asian Seas Region", commonly referred to as the East Asian Seas Action Plan. The East Asian Seas Regional Coordinating Unit (EAS/RCU) acts as the secretariat of COBSEA.

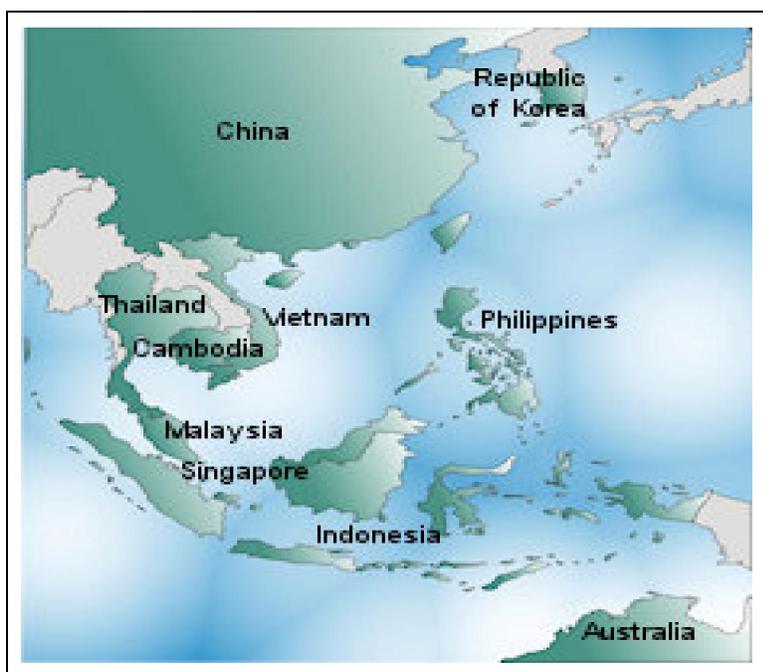
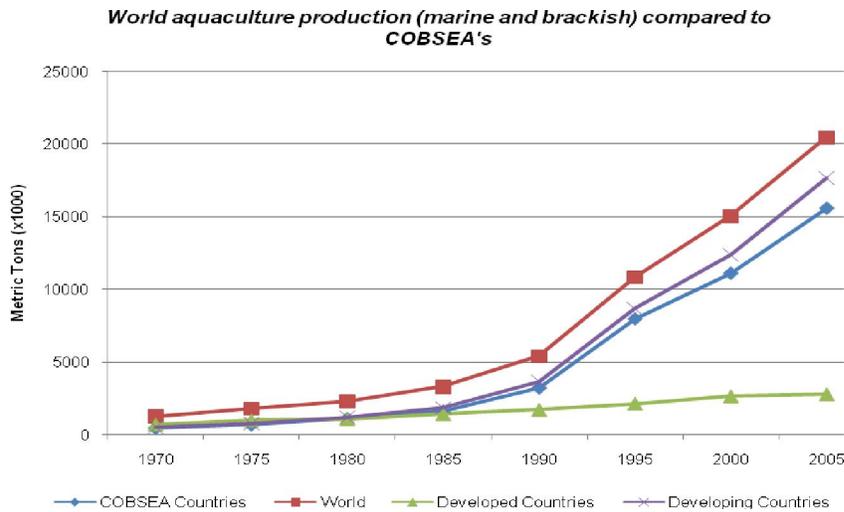


Fig. 1 - The COBSEA Region

The region contains a number of large marine ecosystems and regional seas: the East China Sea, South China Sea, Gulf of Thailand, Sulu-Celebes Sea, Indonesian Seas, North Australian Shelf and Northwest Australian Shelf, and the Andaman Sea. The connection between the Indian and Pacific Oceans separate the continental shelves of Asia and Australia. Almost all COBSEA member countries have extensive coastlines particularly the archipelagic states of Indonesia and the Philippines. The territorial seas of all member countries total 5,495,270 km², which is a significant 29.2% of the earth's ocean surface⁵.

The coastal and marine ecosystems are among the richest and most productive in the world and are of vast social and economic importance with over 73% of the population of almost 2 billion living in coastal areas. Economic development and rapid population growth have thus placed tremendous pressure on coastal and marine ecosystems, resulting in unsustainable resource exploitation and environmental degradation. Intensifying the concern are threats from climate change and natural hazards⁵.

Invasive species have recently been identified as an emerging issue in the region which has one of the world's highest concentrations of shipping and fishing vessel activity, and which contributes a significant percentage of the global aquaculture production. These, together with increasing levels of marine litter, are likely to result in an increasing number of alien species introductions. Pathogens are of particular concern, with the whitespot and yellowhead viruses, for example, having caused catastrophic, multi-million dollar crop losses in Asia's shrimp aquaculture industry.⁵



There is therefore an urgent need to introduce effective measures to prevent the introduction of new, potentially invasive marine and coastal species into the region, and to eradicate, control, or mitigate the negative effects of those already present.

IOC/WESTPAC have recently initiated a regional project on marine invasive species as a contribution to the High Level Objective of IOC/UNESCO (2008 – 2013) on “safeguarding the health of marine ecosystems”. This will include publication of a report on the “Regional Status of Marine Non-indigenous Species 2009”. Other regional projects/programmes to be approached to join, or support, the COBSEA initiative include PEMSEA, ASEAN, the Yellow Sea LME Project, and the e-Network of Aquaculture Centres in Asia.

3. GOAL AND OBJECTIVES

Goal

To facilitate the effective management of marine and coastal invasive species (MIS) in the COBSEA Region with a view to reducing the impacts thereof on marine biodiversity, ecosystems, the economy and on the health and livelihoods of the peoples of the region.

Objectives:

- Ø To establish a framework for co-operative action on the prevention, management and ongoing control of marine and coastal invasive species in the COBSEA Region
- Ø To assess the status of, and threats posed by, MIS in the region and identify priority species for management action
- Ø To assess the relative importance of the potential pathways and vectors for the introduction of MIS into the region
- Ø To raise awareness of the negative environmental and socio-economic impacts of MIS and promote best practice management options
- Ø To build capacity within the region for effective and efficient MIS management building on existing regional efforts toward integrated marine and coastal management.

4. ELEMENTS OF THE PROGRAMME

On the basis of a preliminary questionnaire circulated to COBSEA Focal Points, the following problems related to the management of marine and coastal invasive species in the region were identified:

- ✓ Limited and incomplete information on the presence, impacts and pathways of marine invasive species
- ✓ A shortage of adequately trained personnel (managers, scientists, taxonomists, technical experts and enforcement officers) and facilities
- ✓ A lack of awareness of marine invasive species and their impacts
- ✓ Where policies and legislation do exist, they tend to be focused on terrestrial and freshwater invasive species rather than marine and in general institutional arrangements do not facilitate the management of MIS.

These constraints form the basis of the elements of this programme, which include:

- Ø Creating an enabling environment for MIS management
- Ø Building the information base
- Ø Enhancing implementation of Best Practice

National and regional activities relating to each of these elements are detailed below.

5. PRIORITY ACTIONS

5.1 Creating an enabling environment

5.1.1 *Regional co-operation and national regulatory frameworks*

Invasive alien species are by definition a transboundary problem and are most effectively addressed at regional or international level. At the same time, most of the regulatory actions take place at national level. Regional co-operation on MIS management is therefore only likely to be effective if it is supported by strong national regulatory frameworks. The following activities are suggested steps towards creating an environment which will promote effective regional co-operation on the management of marine and coastal invasive species:

Regional

- Establishment of a Regional Working Group on Marine and Coastal Invasive Species under COBSEA, but with cross-sectoral representation (Environment, Fisheries and Maritime Administrations) to drive and coordinate the implementation of the programme;
- Development of a Regional Strategy and Action Plan on Marine and Coastal Invasives to streamline efforts within the region and promote sharing of information;
- Establishment of regional research teams and initiatives and development of complementary scientific expertise in the region, especially in the field of taxonomy;
- Encouragement to COBSEA countries to consider ratification of the Ballast Water Management Convention and other relevant international agreements.

National

- Establishment of National Working Groups on Marine and Coastal Invasive Species in participating countries comprising representatives from all relevant stakeholders to coordinate activities at national level;
- Assessment of the regulatory and institutional frameworks at national level to identify gaps and inconsistencies and development of recommendations to address constraints.

5.1.2 *Training and technical support*

At the outset of the programme, a detailed training needs analysis will be undertaken to provide the basis for the development of a training and technical support programme to address these needs. The analysis should include identification of appropriate maritime academies or other potential training and research institutes in each country of the region.

National and/or Regional

Training can be delivered at national or regional levels depending on the requirements. Examples of available training courses/workshops include:

- An introduction to the management of marine and coastal invasive species (UNEP-RS/GISP course) – to be delivered to a cross-sectoral audience;
- Strategies and tools to prevent the introduction of invasive species (GISP);

- Legal and Institutional Frameworks for Invasive Species (GISP);
- Economic Analysis of Invasive Species (GISP);
- Introductory course on ballast water management (IMO/Globallast);
- Risk assessment workshop for training in the standardized risk assessment system for ballast water;
- Training workshop on port baseline surveys;
- Training in Import Risk Assessment (FAO/APEC/NACA);
- Specialised training in surveillance and monitoring;
- Training in compliance and enforcement;
- Training on database development and information sharing;
- Taxonomic training (especially in invertebrates and micro-organisms).

Courses may be directed at training and academic institutions (train-the-trainers), governmental personnel including border officials, port personnel etc.

5.1.3 *Communications and awareness-raising*

To increase the level of awareness and understanding of invasive species in the marine environment, as well as of relevant management initiatives, the following actions may be implemented at the regional and national levels:

Regional

- Dissemination of existing communications materials eg. posters, brochures etc produced by the Globallast Partnerships Programme (IMO), UNEP Regional Seas, GISP, IUCN, Member Countries etc);
- Translation of materials and/or adaptation/ development of materials suitable for use in the region;
- Distribution of official technical documents to relevant government agencies (eg. copies of relevant CBD, IMO, FAO Resolutions, the Ballast Water Management Convention, FAO Guidelines etc);
- Research, design and publication of case studies on marine and coastal invasive alien species impacts highlighting impacts on a range of sectors – for example, food security, fisheries, economic development, public health etc;
- High-level seminars for decision-makers at regional level;
- Inclusion of a section on invasive species on the COBSEA website, including a database, and an appropriate feedback mechanism to national-level managing authorities (e.g. Incursion response alert network). This should be linked to other appropriate aquatic animal disease networks (eg. AAPQIS⁹) as well as databases (eg. Fishbase¹⁰; the FAO database¹¹);

⁹ www.aapqis.org

¹⁰ Fishbase contains the biological characteristics of fish species globally, as well as information on invasiveness & known introductions. <http://www.fishbase.org/search.php>

¹¹ <http://www.fao.org/fishery/dias/en>

- Development of links with existing regional newsletters to maintain ongoing reports of marine invasives management activities (for example, SEAHAB, NACA quarterly newsletter, and newsletter of SEA Fisheries Development Centre).

National

- Translation of materials and/or adaptation/ development of materials suitable for use at national level;
- High-level seminars for decision-makers at national levels.

5.2 Building the Information Base

5.2.1 Status Assessment/s

- Development of preliminary lists of alien and invasive species already in the region based on existing information;
- Preliminary assessment of the impacts of established invasive species, with emphasis on priority species noting that the comprehensiveness of available information is likely to vary depending on the species considered;
- National level baseline assessments (e.g. port baseline surveys) using standard protocols to ensure compatibility at regional and international levels;
- Assessment of ballast water discharge and uptake based on the collection of data using the IMO Ballast Water Reporting Forms. To facilitate data collection and storage, Access database software should be installed in participating ports;
- Assessment of the relative importance of the various pathways for introduction of alien species both into and within the region (i.e. primary and secondary pathways);
- Detailed assessment of the environmental and economic impacts, including positive and negative impacts, of priority invasive species. For species whose distribution is limited to sub-regions, the assessment should include an estimate of potential impacts for the entire region.

5.2.2 Risk Assessment

A regional risk analysis to be undertaken on:

- i) The primary pathways for unintentional introductions (e.g. shipping) and intentional introductions (e.g. aquarium trade, mariculture and coastal management)
 - ii) Alien species which are already present in the region and which could become invasive and spread from one country to another.
-

This will be supported by risk assessments at national level, including port risk assessments aimed at supporting the management of ballast water discharges and Import Risk Assessments for intentional introductions.

5.2.3 Development and maintenance of a regional database

A database of information relevant to the management of marine and coastal invasive species in the region should be developed in close cooperation with the COBSEA East Asian Knowledgebase and linked to the COBSEA website (www.cobsea.org). This will include:

- A list of alien and invasive species identified in the region, including information on the biology; natural and introduced distribution; ecological, health, and socio-economic impacts; management measures etc (and/or links to other relevant sources of information);
- Results of baseline surveys, risk assessments and monitoring programmes;
- An overview of management measures already in place e.g. ballast water management measures in ports and mariculture related measures;
- A directory of research and development initiatives, regional experts (and their areas of expertise) and focal points. This directory needs to be updated frequently by the individual countries;
- Technical guidelines and best practice case studies for use in the region.

The database should build on existing global invasive species information networks and have linkages to them.

5.2.4 Monitoring programmes

Following baseline surveys, ongoing scientific monitoring programmes will be established in key areas – for example, in and around ports being visited by international and/or regional vessels, mariculture facilities and Marine Protected Areas.

It is further suggested that data from existing monitoring programmes in the region be analysed for information on alien species.

In addition, it is recommended that passive surveillance programmes involving the local communities and linked to awareness-raising efforts, be introduced.

5.2.5 Research

Research needs for the region include:

- Compiling a list of definitions and terms and making recommendations on use of terms
- Assessment of the status of alien species in the region by:

- compiling an inventory of all alien marine and coastal species reported from all countries in the region
 - compiling detailed information on the geographic distribution of MIS in the region highlighting trends in terms of spread and/or potential for spread
 - summarising the impacts of MIS in the region.
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- Determination of major pathways for MIS in the region;
 - Determination of which types of communities are invaded and factors influencing the success establishment of MIS;
 - Investigation of the invasion history of MIS;
 - Investigation of the characteristics of invasive species (such as genetic variability, physiological tolerance, reproductive strategy, hybridization with native species, and impact on native genotypes) with a view to predicting the establishment, spread, impact and economic consequences of invasions;
 - Development of appropriate risk assessment, control and eradication methods;
 - Enhancing understanding the links to other threats – for example, climate change; and
 - Taxonomic research, including new species identification approaches, such as molecular technologies.

These will be sub-divided into short-term and long-term priorities.

5.3 Promoting Implementation of Best Practice

5.3.1 National Action Plans (NAP)

Few of the COBSEA countries are currently addressing the problem of marine and coastal invasive species in a comprehensive manner. It is recommended that each of the participating countries develops a National Action Plan for the management of marine and coastal invasive species that will support, and generally follow, the regional activities. The NAP may be a stand-alone document or part of the National Biodiversity Strategy and Action Plan as required by CBD, and should be consistent with the “*Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species*” adopted by COP VI of the CBD¹².

5.3.2 IMO Guidelines

The Marine Environment Protection Committee (MEPC) of the IMO has developed a series of guidelines to facilitate uniform implementation of the Ballast Water Management Convention. They include:

- G 1 Guideline for Sediment Reception Facilities
- G 2 Guideline for Ballast Water Sampling

¹² Decision VI/23 on *Alien species that threaten ecosystems, habitats and species*(COP 6 in 2002).

- G 3 Guideline for Ballast Water Management Equivalent Compliance
- G 4 Guidelines for Ballast Water Management and Development of Ballast Water Management Plans
- G 5 Guideline for Ballast Water Reception Facilities
- G 6 Guidelines for Ballast Water Exchange
- G 7 Guidelines on Risk Assessments under Regulation A-4
- G 8 Guidelines for the Approval of Ballast Water Management Systems
- G 9 Procedure for Approval of Ballast Water Management Systems that make use of Active Substances
- G 10 Guideline for Approval and Oversight of Prototype Ballast Water Treatment Technology Programmes
- G 11 Guideline for Ballast Water Exchange Design and Construction Standard
- G 12 Guidelines for Sediment Control on Ships
- G 13 Guidelines for Additional Measures Including Emergency Situations
- G 14 Guidelines on Designation of Areas for Ballast Water Exchange
- G 15 Guidelines for Port State Control

Seminars/ workshops on both national and regional level will be held to publicise and promote the implementation of these guidelines as appropriate. It is recommended to group the guidelines and address more than one in each workshop as appropriate also considering that the target audience of each workshop may be different.

5.3.3 Guidelines on fisheries and aquaculture

The introduction and transfer of aquatic animals and plants for the purposes of fisheries and aquaculture presents a number of challenges to the institutional frameworks for managing health, environment and aquatic production. The introduction of invasive species can occur as a result of deliberate aquaculture introductions or accidental introduction of species that are carried along with the aquatic species being introduced. These accidental introductions are either other aquatic animals or plants, or microorganisms, with aquatic pathogens being of particular concern.

The FAO and other organizations have developed a number of guidelines which are pertinent to such introductions. These include:

Introduction and movement

Introductions of aquatic animals for aquaculture purposes should be preceded by Import Risk Assessments and appropriate quarantine procedures. Relevant guidelines include:

- § Understanding and applying risk analysis in aquaculture. FAO fisheries Technical paper 519 <http://www.fao.org/docrep/011/i0490e/i0490e00.htm>
- § Asia-Regional Technical guidelines on health management for the responsible movement of live aquatic animals. FAO Fisheries Technical Paper 402 <http://www.fao.org/DOCREP/005/X8485E/x8485e00.htm>
- § Manual Of Procedures for the implementation of the Asia Regional technical guidelines on health management for responsible movement of live aquatic animals, FAO technical Paper 402/1 <http://www.fao.org/docrep/005/Y1238E/Y1238E00.HTM>
- § Manual on risk analysis for the safe movement of aquatic animals [FWG/01/2002] http://www.dnr.state.md.us/fisheries/oxford/publications/04_fwg_iramanual.pdf
- § ICES code of Practice on the introduction and transfers of marine organisms http://www.oceansatlas.com/world_fisheries_and_aquaculture/html/resources/aqua/introspec/img/itmo.pdf
- § Harmonised guidelines for national strategies in aquatic animal health: Biosecurity in ASEAN. (AADCP: RPS 370-021).
- § Responsible movement of Live Food Finfish in ASEAN Countries (AADCP: 370-018).

Marine enhancement or ranching

This includes the placing of broodstock directly into the environment and/or where the animals are bred in hatcheries with the juveniles being used as stock for the fisheries.

- § A risk analysis framework for aquatic animal health management in marine stock enhancement programmes. Devin M. Bartley, Melba G. Bondad-Reantaso, Rohana P. Subasinghe. Fisheries Research, Volume 80, Issue 1, August 2006, Pages 28-36. Restocking and Stock Enhancement of Coastal Fisheries - Potential, Problems and Progress, Special Symposium, 7th Asian Fisheries Forum.

Surveillance and zoning

A systematic approach to surveillance and zoning is an important component of effective risk assessment for importation and movement of aquatic animals, both within a country as well as between countries.

- § Surveillance and zoning for aquatic animal diseases, FAO, Fisheries technical Paper 451 <http://www.fao.org/docrep/007/y5325e/y5325e00.htm>

Animal health emergencies

- § Preparedness and response to aquatic animal health emergencies in Asia: guidelines. FAO Fisheries Technical Paper 486. <http://www.fao.org/docrep/009/a0090e/a0090e00.htm>

Seminars/ workshops will be held to publicise and promote implementation of these guidelines as appropriate.

5.3.4 *Marine ornamentals*

Marine species imported for ornamental purposes should be subject to the same Import Risk Assessment and quarantine procedures as those species introduced for fisheries or mariculture purposes. These are covered by the ICES Technical Guidelines.

5.3.5 *Development and adoption of regional guidelines*

In cases where international guidelines are not yet available, consideration will be given to the development of regional guidelines – for example, on biofouling. In such cases, the guidelines will be based on current best practice at national level, or in other regions.

5.3.6 *Demonstration activities*

A number of demonstration activities (if possible, one in each participating country) on various aspects of MIS management, including prevention, eradication, and control should be developed to build experience and serve as models for later replication. These could take the form of technical support for:

- Ø The application of the Import Risk Assessment
- Ø Port baseline surveys
- Ø Ballast water sampling etc.

6. IMPLEMENTATION OF THE PROGRAMME

6.1 Budget and Timeframe for Implementation

To be developed.

ANNEX 1 –

EXTRACT FROM THE FINAL REPORT OF TWENTIETH MEETING OF THE COORDINATING BODY ON THE SEAS OF EAST ASIA ON THE EAST ASIAN SEAS ACTION PLAN (20TH IGM OF COBSEA), HA LONG CITY, VIET NAM; 2-5 NOVEMBER 2009

AGENDA ITEM 8: COBSEA's regional initiative on marine invasive species

6. The Chairperson invited the Secretariat to present Document IGM 20/8, the draft outline programme for COBSEA's recommended regional activity to address marine and coastal invasive species. COBSEA Secretariat presented an overview of the problem of MIS and the initiative that had been undertaken by the Secretariat. The Secretariat introduced the various definitions of invasive alien species (MIS), and noted that MIS as one of the greatest threats to biodiversity globally.

7. The Secretariat mentioned the economic, ecological and health impacts of MIS, and the various pathways for introduction through intentional and unintentional means. He noted the limited information about MIS in East Asian Seas despite region's vulnerability to the phenomena. The Secretariat noted that MIS has been identified as an emerging issue in the New Strategic Direction for COBSEA adopted in January 2008.

8. The Secretariat then described the COBSEA Training & Review Workshop on MIS that was held on 31 August – 4 September 2009 to support the development of a regional programme on MIS, and the main objectives and components of the suggested regional programme on MIS: creating an enabling environment for MIS management; building the information base; and enhancing implementation of Best Practice. He also identified the main regional and global partners to this recommended programme and requested the IGM to discuss the matter and endorse the regional programme that was recommended by the group of experts and the Secretariat.

9. The COBSEA Coordinator requested the meeting to consider the adoption of the regional programme on MIS, while its future will depend on availability of funds to implement the programme and to develop the regional strategy or action plan on MIS. He noted that a possible source of funding for this important activity would be to integrate it into the SAP Implementation project, under the ecosystem component.

10. Some concerns were expressed by some countries on possible overlapping or duplication with other MIS initiatives carried out in the region such as the one by IOC/WESTPAC and the APEC Working Group on MIS or global initiatives such as IMO's Convention on ballast water or the GloBallast programme.

11. But the Secretariat reassured the meeting that in the preparation of the programme and the future action plan on MIS all partners were fully consulted and work has been closely coordinated with them. MIS activities would be implemented without duplication and through cooperation with all relevant partners, in particular with IOC/WESTPAC that provide technical and scientific aspects while COBSEA will serve as the management and capacity building platform.

12. All countries supported the initiative and approved the MIS regional programme for COBSEA pending the availability of funds. The meeting has also agreed that a component on MIS will be developed under the GEF SAP Implementation project to provide adequate funding for this high priority activity, as MIS is an emerging concern for the region threatening the health and productivity of coastal and marine ecosystems.