



Halong Bay, Vietnam
Photo: W.Y. Chiau

Bulletin on APEC Marine Resource Conservation and Fisheries

November 2003 VOL. V No. 3

Publisher

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This Bulletin on APEC MRC is available on the
Web site,

<http://enix.epa.gov.tw/aboutvc.htm>

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Bulletin on APEC MRC and Fisheries

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Donna M. Petrachenko

APEC – Lead Shepherd - 2003

Marine Resource Conservation Working Group



Appointed as Assistant Deputy
Minister – Special Envoy for Asia
Pacific for Fisheries and Oceans
Canada in 2003, Ms. Petrachenko is
leading departmental efforts in the
Region and continuing co-operative
initiatives between Canada and
APEC Economies. This work will
include cross-appointments as:
Visiting Deputy Secretary at
Environment Australia; Professorial
Fellow at the Centre for Maritime
Policy, University of Wollongong;
and most recently, as Lead
Shepherd of the APEC Marine
Resources Conservation Working
Group.

Prior to this appointment, she held
two executive operational positions
during the previous eleven years in
western Canada.

The most recent as Regional
Director General – Pacific Region
(Fisheries and Oceans Canada)
where she was responsible for the
delivery of an integrated marine and
coastal program with an annual
budget of \$300 million and 2,500
employees. Duties included:
advancing marine conservation
efforts through scientifically
defensible decision-making, policy
development, relationship building
with aboriginal peoples,
federal-provincial cooperation, and
facilitating maritime trade through a
professional Coast Guard service.
Previous to that as Regional
Executive Director – Western

Canada (Parks Canada) where she
delivered a national parks program
including: 25 national parks - national
park reserves - marine conservation
areas, and 25 national historic sites
encompassing an area of 165,000
square kilometres with the aid of
3,000 employees.

Ms. Petrachenko recently chaired a
workshop of international experts
concerning the governance of high
seas biodiversity conservation held in
Cairns, Australia; she has chaired
APEC workshops on oceans
governance; and she has led
numerous Canadian delegations to
multinational fora on oceans
governance, fisheries management
and marine conservation.

Her research interests are: (1) Marine
biodiversity conservation (2) Oceans
law, policy, and governance (2)
Integrated marine and coastal
planning (3) Aboriginal peoples'
marine-related rights.

Ministerial Appointment

Past Canadian Chair of the Canada –
USA Pacific Salmon Commission

Academic Qualifications

Master of Arts, Public
Administration
Carleton University, Ottawa,
Canada
Bachelor of Arts, First Class
Honours in Public
Administration
Carleton University, Ottawa,
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Languages

Fluent in both English and
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APEC Marine Resource Conservation Working Group

Report of the 16th Meeting

Hanoi, Vietnam

11th and 12th October 2003

The 16th APEC Marine Resource Conservation Working Group meeting was held on 11th and 12th October 2003 in Hanoi, Vietnam and was hosted by Viet Nam with support being provided by the United States of America. The Meeting was attended by 38 participants from twelve economies, namely: Australia; Canada; Chile; the People's Republic of China; Hong Kong, China; Japan; Republic of Korea; Mexico; Chinese Taipei; Thailand; the United States of America; and Vietnam. The APEC Secretariat also attended. UNEP – Office of the Global Program of Action for the Protection of the Marine Environment from Land-based Activities (GPA) was present as a guest.

Opening

The meeting was opened by Philip Burgess of Australia, the host economy for the 15th Meeting in 2001. Mr. Nguyen Viet Manh, Meeting Overseer (Vietnam), welcomed delegates to Hanoi and then Mr. Burgess undertook roundtable introductions.

Election of Officers and Adoption of the Agenda

Mr. Burgess then facilitated the election of officers for the meeting. The officers were: Mr Nguyen Viet Manh, Meeting Overseer (Vietnam) and Ms. Donna Petrachenko, Lead Shepherd MRCWG (Canada) as meeting co-chairs; and Mr. Sam Baird, Delegate (Canada) as rapporteur.

Mr. Burgess sought and obtained approval for the meeting agenda as presented (APEC/03/MRC16/1.0)

Past Lead Shepherd's General Observations: The Year 2002/2003 in Review

Philip Burgess (Australia) delivered an oral presentation on behalf of the past Lead Shepherd, Ms. Alison Russell-French (Australia) who was unable to attend the meeting. This report is attached as Annex 1 (APEC/03/MRC16/2.0)

Incoming Lead Shepherd's Introduction and General Observations

Ms. Donna Petrachenko (Canada), the incoming Lead Shepherd, introduced herself and provided delegates with an oral presentation which focussed on five specific areas where she feels the working group should undertake some further reflection. These five areas are: (1) Progress on Marine Conservation Efforts with other Regional Bodies; (2) Progress on Oceans Policy and

Governance Efforts; (3) Relevance to the APEC Mandate; (4) Project Proposal Process; and (5) Project Evaluation Process. This report is attached as Annex 2 (APEC/03/MRC16/3.0).

APEC Secretariat Report

Mr. Timothy Hsiang, APEC Secretariat, provided an oral presentation on 'General Developments in APEC'. Much of his discussion focussed-on SOM discussion topics and management challenges faced throughout the year in review; ECOTECH Priorities; and the introduction of new processes to promote accountability in the management of APEC projects. This report is attached as Annex 3 (APEC/03/MRC16/3.0). Additional information related to the new APEC web site is filed at (APEC/03/MRC16/3.1) and information related to disbursements for MRCWG projects is filed at (APEC/03/MRC16/3.2).

Roundtable Statements by Member Economies



MRCWG 16
Hanoi, Vietnam

Each economy presented a report on their domestic progress on marine resource conservation efforts; their contribution to domestic and international marine-related policy initiatives; and on their efforts to advance the implementation of the Seoul Oceans Declaration.

Australia

Discussion surrounded (1) Strategy to combat IUU fishing (2) High Seas Biodiversity Conservation (3) Rezoning of the Great Barrier Reef Marine Park to significantly increase the size of 'no-take' zones (4) Progress to declare the Torres Strait a Particularly Sensitive Sea Area (PSSA) (5) Launch of the draft South-East Regional Marine Plan (APEC/03/MRC16/5.01).

Canada

Discussion surrounded (1) Reflecting important international oceans and coastal events occurring during the year in review (2) The Canada Oceans Act and its implementation strategy (3) United Nations Fish Stocks Agreement (4) IUU fishing (5) Domestic, regional, and global monitoring (APEC/03/MRC16/5.02).

Chile

Discussion surrounded the implementation of the Global Program of Action: (1) National Aquaculture Policy (2) Management Areas for the Exploitation of Benthic Resources (3) Towards a new Recreational Fisheries Law (4) Upcoming workshops on Environmental Policies and Principles in Aquaculture Administration and Management Framework for Control and Prevention of Introduced Marine Pests to be facilitated in 2004 (5) Advances in wastewater treatment. (APEC/03/MRC16/5.04)

The People's Republic of China

Discussion surrounded (1) National Marine Economy Development Plan (2) Law on Sea Use – first year of implementation (3) Bilateral agreements on marine affairs signed with Russia and India (APEC/03/MRC16/5.04).

Hong Kong, China

Discussion surrounded (1) Upgrading of sewage collection and disposal system (2) Domestic progress to prevent marine pollution and protect marine resources from development projects (3) Development of water quality related policies and pollution control strategies (4) Designation and management of marine parks and marine reserves (5) Conservation of corals and Chinese white dolphins (6) Artificial reef deployment programme (APEC/03/MRC16/5.05).

Japan

Discussion surrounded (1) The Basic Fishery Law (2) National Biodiversity Strategy (3) International Coral Reef Initiative - Global Coral Reef Monitoring Network (4) Establishing countermeasures against red tides (5) Monitoring contamination of fish and shellfish (APEC/03/MRC16/5.06).

Republic of Korea

Discussion surrounded (1) master plan for marine environment conservation (2)

protecting marine environment from sea-based activities (3) Enhancing marine pollution response and treatment capacities (4) Buying Marine Waste (5) Designation of Marine and Coastal Protected Areas (6) Aquaculture Grounds Management Act (APEC/03/MRC16/5.07).

Mexico

Discussion surrounded (1) Coastal and offshore Marine Protected Areas (2) Marine turtles nesting sites decreed Sanctuaries (3) Mexican waters become refuge for marine mammals (4) Centers for the protection and conservation of Sea Turtles on the Mexican Pacific coast (5) Fisheries sustainable exploitation (6) Sustainable development of coastal wetlands (APEC/03/MRC16/5.08).

Chinese Taipei

Discussion surrounded (1) Marine Pollution Control Act (2) National Contingency Plan for Marine Oil Spills (3) Port Waste Reception Facilities (4) Marine Environment Classification and Quality Standards (5) Marine Environment Monitoring Stations (APEC/03/MRC16/5.10).

Thailand

Discussion surrounded (1) Structural and administrative reform within Central Government for management of coastal and marine resources (2) National Marine Policy (3) Conservation and rehabilitation of sea grass, coral reefs and threatened and endangered species (4) Rehabilitation of marine living resources (APEC/03/MRC16/5.11).

USA

Discussion surrounded (1) U.S. Commission on Oceans Policy (2) White Water to Blue Water Initiative (3) the Earth Observation Summit (APEC/03/MRC16/5.12).

Viet Nam

Discussion surrounded (1) Relationship between the national economic development, environmental protection and suitable use of the natural resources (2) Protected marine areas (3) Domestic marine-related law and regulations (4)



MRCWG 16
Hanoi, Vietnam
Photo: W.Y. Chiau

Participation of local people in marine protected area processes (5)
Harmonisation between conservation, tourism and marine economics (APEC/03/MRC16/5.13).

Informal Group on Oceans Policy

It was noted that at the 15th APEC Marine Resources Conservation Working Group (MRCWG) meeting in 2002, it was agreed that an 'Informal Group on Oceans Policy' be established. The aim of the Informal Group was to analyse the MRCWG's traditional and historic roles, the newer policy directions arising from leaders' statements; and to propose a strategic policy direction for the MRCWG that strengthens its policy role on ocean and coastal matters within APEC.

Australia had agreed to assume an ad hoc lead position for this Informal Group, and all economies were encouraged to participate. In September 2002, Canada, China, and Peru agreed to participate in the Informal Group.

Australia tabled a draft informal discussion paper that was prepared as a contribution to the development of integrated approaches to oceans management within the APEC working group structure. The paper examines the progress of working groups in implementing APEC oceans declarations, and collaborative efforts between working groups; and includes some draft recommendations for strengthening the current approach to oceans management within APEC.

Comments are sought on the draft paper which will later be edited and distributed to working group members.

Implementation of the Action Plan for the Sustainability of the Marine Environment

MRCWG 15 called for a report on the status of the implementation of the 1997 Action Plan for the Sustainability of the Marine Environment. This work has not been completed. It was the view of



MRCWG 16, Banquet
Hanoi, Vietnam
Photo: W.Y. Chiau

member economies that such a report deserves more thorough attention in the coming year, and there may be merit in updating the Action Plan to take account of recent developments. This update could also involve the FWG.

MRCWG Strategic Framework and Operational Plan

MRCWG 15 requested the preparation of a draft operational plan. This has not been completed. MRCWG 16 recognised that it was difficult to prepare an operational plan in the absence of a clear strategic framework for the WG. Given the importance of this topic MRCWG 16 convened a small team including Australia, Canada, Chile, Mexico, and the United States to prepare a framework for the development of a strategic approach for the work of the MRC. This approach was discussed, and it was agreed that it should include reference to the input from the FWG as well as international organisations; and will take account of additional priorities since the promulgation of the Action Plan for the Sustainability of the Marine Environment. Next steps are for the small team to elaborate on the framework and seek advice from all working group members intersessionally, with a view to adoption of the strategy at MRCWG17. UNEP's offer to assist with this work was accepted. The strategic approach will take account of emerging policy issues, leaders'

directions, improved rigor in the evaluation and review criteria for projects, and improved horizontal and vertical communication of MRC programming.

Pacific Islands Regional Oceans Policy Implementation

Australia reported on the Pacific Islands Regional Ocean Policy (PIROP) on behalf of the Pacific Islands Forum Secretariat (ForumSec). PIROP was endorsed by the Pacific Islands Forum Leaders in August 2002. The Pacific region, through the Council of Regional Organisations of the Pacific (CROP) Marine Sector Working Group, is working towards the implementation of this Ocean Policy, and is currently planning for a Pacific Islands Regional Ocean Forum (PIROF), to be held in February 2004 in Fiji. At that meeting a framework for implementation of the Pacific Islands Regional Ocean Framework for Integrated Strategic Action (PIROF-ISA) will be finalised and considered for endorsement.

Australia is assisting the development of PIROF-ISA as one of its World Summit on Sustainable Development "Type 2" partnerships.

Australia also noted that implementation of PIROP is the first example of a regional approach to oceans policy and agreed to contact ForumSec to ensure that MRCWG members receive copies of PIROP and invitations to PIROF. PIROP can also be accessed at: <http://www.piocean.org/policy/oceanpolicy.htm>

A Strategic Approach for APEC Regional Oceans and Coasts

The Chairperson of the SOM Sub-Committee on ECOTECH (2002) requested that a presentation on the APEC Integrated Oceans and Coastal Management Forum (2002-Canberra, Australia) be made to the Sub-Committee during 2003 and that efforts be undertaken to better inform SOM of this important subject area. The

Lead Shepherd reported on her activity of making this presentation to the Sub-Committee on ECOTECH and to SOM Plenary at SOM 3 in Thailand during August 2003.

The USA requested that any presentations which are on behalf of the MRCWG be agreed by the working group. Presentations need to clearly distinguish between agreed positions of the MRCWG, and the results of workshops and projects which may not have been considered by all working group members.

Review of Current and Proposed Work Programs

Project overseers' and contractors informed the meeting of progress on their projects. These were:

- Development and Validation of Phycotoxin Methods, Standards and reference Materials for Seafood Product Certification and Safety (Year 3 of 3) (MRC 01/2002T) Chinese Taipei
- Oceans Models and Information System for APEC Region 2002-Sea Watch in Asia Pacific with Telemetry (SWAT) (MRC 04/2002) Chinese Taipei
- Development of a Management Framework for APEC Economies

for use in the Control and Prevention of Introduced Marine Pests (MRC 02/2003) Chile/Australia

- APEC Marine Environmental Training and Education Program (3rd year) (MRC 03/2003) Korea
- Ocean Models and Information System for APEC Region (OMISAR) (MRC 04/2003) Chinese Taipei
- APEC Member Profile Database of Ocean Governance Arrangements (MRC 05/2003). Canada/Australia
- Third APEC Roundtable Meeting on the Involvement of the Business/Private Sector in the Sustainability of the Marine Environment (Self-funded) Chinese Taipei
- Water Quality Criteria/Standards Adopted in the Asia Pacific Region (Self-funded) Hong Kong, China
- Strategy and Implementation of Harmful Algae Management and Mitigation in the APEC Region (SIHAB) (Self-funded) Chinese Taipei

- A joint project on Oil Spill Response postponed from 2000/2001 will now proceed – A Workshop will be held in Singapore during March 2004 (self-funded) USA / Singapore

Member economies and/or project overseers for proposed year 2004 projects provided a brief description of those projects:

- APEC Integrated Oceans Management Forum 3 (MRC01/2004) Canada/Australia
- Workshop on the Modern Approaches to Linking Exposure to Toxic Compounds and Biological Effects (MRC02/2004) Korea/Australia
- A Comparative Assessment of the Institutional Response to the Incorporation of the El Nino Southern Oscillation Signal in Fisheries Management (MRC03/2004) Chile
- Ocean Models and Information Systems for the APEC Region (MRC04/2004) Chinese Taipei
- Economic Value of the Marine Sector Across APEC Member Economies (MRC05/2004) Canada/Australia



Hanoi, Vietnam
Photo: W.Y. Chiau



Halong Bay
Vietnam
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- Workshop on an APEC Review of Environmental principles and Policies in Aquaculture Administration (MRC01/2004T) Chile

It is recognised that a number of projects that were approved by the MRCWG but failed to receive funding through the BMC budget cycle may proceed as self funded projects. It was noted that in considering and communicating its work program, the MRCWG should take into account all aspects of its work, both self-funded and funded through Operational and/or TILF accounts.

Involvement of the Business/Private Sector (B/PS) in MRCWG Activities

General discussion on this matter took place. Chinese Taipei provided an overview of their experience drawn from their work on facilitating three round tables on the involvement of the business and private sector in marine activities. Canada emphasised the need to continue to reach-out to industry to engage them in MRCWG work. Canada also suggested that the MRCWG consider organizing a roundtable for a specific sector (e.g. offshore oil and gas or aquaculture) that could be held in conjunction with a working group meeting. The intention would be for the private sector participants to contribute their input to the policy and program agenda of the working group. The Lead Shepherd suggested that consideration be

given to including the involvement of the private sector as a component of future project proposals and a consideration in the development of our new strategic plan. The Lead Shepherd undertook to contact other WGs who have good private sector engagement, to seek their advice on strategies for successful B/PS interactions.

Preparation for Joint Session with FWG

There was discussion on the merits of continuing to meet biannually with the FWG. There was general favour expressed by most participants to continue the practice. The Lead Shepherd indicated that even though it is important to share strategic directions with FWG (as outlined in the *Seoul Oceans Declaration*), it is also important to maintain separate agendas. A list of topics arising from the current MRCWG meeting that could be of interest to the FWG was presented by the Lead Shepherd. Some discussion followed.

Date and Location for the MRCWG 17

The Lead Shepherd and the APEC Secretariat informed the meeting of the importance for an economy to come forward to volunteer to host MRCWG 17 before the end of the calendar year. The Lead Shepherd provided delegates with information on who had previously hosted meetings since the MRC's creation in 1991 and urged economies to

consider entering into arrangements to host MRCWG 17 in combination with other meetings and events that may be planned to take place in their economies. The APEC Secretariat explained the option for holding meetings at the Secretariat facilities, but recommended the preferred option is to have a hosted meeting.

Other Matters

The meeting welcomed Chinese Taipei's offer to produce a special edition of the MRC/FWG Bulletin in mid-2004 to summarise MRC's past achievements.

Access to MRCWG 16 Documents

The meeting agreed to the release of meeting documents as outlined in Appendix Four.

Adoption of the Report of the Meeting

The meeting agreed to the adoption of the Report.

Close

The Lead Shepherd, MRCWG, thanked Vietnam for the excellent organisation of the 16th MRCWG meeting and the 3rd MRCWG/FWG Joint Meeting.

APEC Marine Resource Conservation Working Group

Report of Mexico



Ms. Leonora Rueda
Photo: W.Y. Chiau

Ms. Leonora Rueda

***HEAD, Minister,
Embassy of Mexico in Hanoi, Vietnam***

Brief overview of the progress made by Mexico on marine resource conservation, and its contribution to overall Asia-Pacific marine resource conservation efforts

Mexico's marine Economic Exclusive Zone covers 2,926,252 km², and her overall coastline is 11,500 km long, of which 8,475 km pertains to the Pacific coast.

Mexico's portion of the Pacific Basin is characterized by its narrow continental shelf and its great environmental heterogeneity. The Pacific coastline extends from the Upper Gulf of California, one of the most arid regions of the planet, with the largest evaporation basin on the Pacific, to the coasts of Oaxaca and Chiapas, with their characteristic high rainfall and tropical vegetation, together with 893,000 ha of river estuaries.

In oceanographic terms, the Mexican Pacific includes a large inter-tropical convergence zone, where cold water currents from the north mix with warm water traveling northwest from the equator, thereby creating special conditions for marine wildlife.

Around 75% of the national fish catch comes from the Pacific, of which 85% is caught offshore from those states north of the tropic of Cancer. The cold current running south along the north Pacific coast is responsible for zones of upwelling and a great nutrient abundance, which in turn supports the large populations of commercial species which form the nation's principle fisheries. The north Pacific region is also the most important zone for Mexico's aquaculture industry (shrimp farming in particular), high tect irrigation agriculture and assembly plant "maquiladora" industry.

In term of conservation and sustainable management, Mexico has 30 protected natural areas in the Pacific – both coastal and offshore: eight Biosphere Reserves, five National Parks, three Flora and Fauna Protection Areas and 14 Wildlife Sanctuaries.

During 2003, all the principal beaches used by marine turtles for nesting sites were decreed Sanctuaries, the most important of which are almost all on the Pacific coast. As of 1990, a total and permanent ban on the capture of all species of sea turtle was implemented, and the protection of females, eggs and hatchlings was stepped up on beaches used for nesting.

Today, there are 17 Centers for the Protection and Conservation of Sea Turtles on the Mexican Pacific coast, operated by the Section of Wildlife of the Environment Ministry, together with 84 registered protection camps operated by various agencies, giving a total of 101 camps along the length of Mexico's Pacific coast-plus 51 others on the beaches of the Gulf of Mexico and the Mexican Caribbean.

New protected natural areas on the Pacific coast are still pending their decree: San Pedro Martir Island (Sonora), an AREA OF 30,165 ha; and the islands of la Pajarera, Cocinas, Mamut, Colorados, San Pedro, San Agustin, San Andres and Negrita, and the islets Los Anegados, Novillas, Mosca and Submarino (Jalisco) , with a combined total area of 1,981 ha.

In addition, approval has already been given for the creation of two more natural protected areas, as Flora and Fauna Protection Areas; the Islas Marieta, off the coast of Nayarit, with a total area of 1,357 ha, and Isla Guadalupe, with an area of 366,360ha – their respective decrees are in the process of publication. During 2003, the management of wetland areas (under Ramsar Conservation criteria) were transferred to the National Commission for Protected Natural Areas, permitting better control and the carrying out of research and

educational activities to improve their conservation.

In terms of their contribution to the conservation of marine resources in the Mexican Pacific, two government programs are of particular importance. Firstly, the decree published in 2002 converting all of Mexico's waters into a refuge for marine mammals, including the Economic Exclusive Zone as well as continental and coastal waters.

The second is the National Program for Marine Turtle Protection, which protects the nesting beaches and safeguards the eggs and hatchlings of the endangered species of turtle which nest on Mexico's shores, until they return safely to sea. Sea turtle species protected on the Pacific coast of Mexico are: The Olive Ridley (*Lepidochelys olivacea*), the Pacific Green Turtle or Black Turtle (*Chelonia mydas*), the Leatherback Turtle (*Dermochelys coriacea*), and sporadically females of the Hawksbill Turtle (*Eretmochelys imbricata*) will nest in low numbers on certain beaches on the coast of Jalisco.

This program has received strong backing due to the participation of private and public capital investment, together with a publicity campaign promoted with the aid of all the country's principal mass media.

Measures that have been taken to push initiatives in marine policy both nationally and at the Asia-Pacific regional level (including regulatory reform and international oceans governance)

National Fisheries Policy Guidelines (NFPG). This is an essential element for the management of Mexico's fisheries, based on the scientific understanding of the population dynamics of each commercial species and the best practices for their sustainable exploitation. The NFPG establishes a scientific and technological basis for fisheries policy,

especially for the granting of fishing permits, concessions and authorizations, the fishing methods and technology to be used and the permitted catch size for each species, according to the ecosystem in which it occurs and the socioeconomic context of the Fishery. The NFPG was published in 2000 when the fishing sector was part of the Environment Ministry still retains responsibility for the approval of modifications to the Plan and the environmental protection measures established therein.

Consultation of the National Fisheries Policy Guidelines is obligatory for public servants responsible for fishing policy, so as to assure its correct implementation.

- The Decree incorporating Mexico's Economic Exclusive Zone as part of a Refuge from hunting for large marine mammals, and to ensure their physical safety and that of the ecosystems which they use for their reproduction, as nurseries, for feeding, growth and migration. This Decree includes all marine waters over which Mexico has sovereignty and legal jurisdiction: territorial waters, inland waters and the Economic Exclusive Zone itself.
- The Wildlife Law of January 2002 prohibits all extractive exploitation of marine mammals in Mexican waters, save for the purpose of scientific research or higher education.

- In February 2003 an Official Mexican Standard was published (NOM022), which establishes specifications for the preservation, conservation, sustainable development and restoration of the nations' coastal wetlands. This Standard regulates and adequately orientates all those activities which might otherwise place

coastal wetlands at risk or lead to their deterioration, within the framework of integrated catchment management.

- Another Standard, regulating the management of marine mammals in captivity – establishing conditions for their capture for scientific research, their transport, exhibition, management and maintenance of their quality of life – is currently in the process of final approval. In accordance with the policy for the protection of marine mammals which Mexico has strongly pursued, this Standard addresses aspects such as health, the preparation and management of food, water quality and the characteristics of the areas to which the animals will be confined, among other specifications.

In parallel with these developments, the Environment Ministry has strengthened the integral management of marine and coastal resources through the coordination of various institutions with different



Marine Studies, Kino Bay Center, Mexico
http://www.prescott.edu/highlights/kino/marine_studies.html

El Arco, Cabo San Lucas, Mexico
<http://www.webshots.com/g/32/35548-sh/35583.html>



responsibilities (enforcement, research, protected species programs, environmental planning, etc), by conforming a single umbrella Group which establishes common criteria and strategies for action.

The Environment Ministry has also established inter-ministerial agreements with the Navy, the Health Ministry, the Agriculture and Fisheries Ministry and the Tourist Ministry, for the implementation of measures which permit the sustainable development of marine and coastal resources, as well as improvements in the quality of the activities undertaken in these environments

Progress on the implementation of the Seoul Declaration on Oceans

The measure taken by Mexico to improve the conservation, protection and sustainable use of marine resources described above, conform to the spirit of the Seoul Declaration. Other measures with this objective include the following:

➤ **At the national level:**

The improved management of coastal and marine protected natural areas, emphasizing an ecosystemic approach, has been promoted and developed.

Measures have been taken to improve the environmental conditions of coastal ecosystems, including the Clean Beaches Program which commenced this year, in which the Ministries of the Environment, Health, Tourism and the Navy work in conjunction to monitor water quality in bathing areas adjacent to the most important tourist beaches. The results of this monitoring are available to the public on the Ministry's website, and color coded flags are placed on the beaches to advise the public of water quality, according to OMS guidelines. This program has led to improvements in local water treatment infrastructure,

through joint actions carried out by federal, state and municipal authorities together with private sector tourist enterprises. This Program has also led to the participation of social organizations in the maintenance of cleanliness and hygiene on the nation's beaches and co-responsibility for reducing health risks in bathing area. A new – voluntary – standard is currently in preparation which aims to foment the certification of environmental quality and turistic services on Mexico's beaches, conforming to international criteria.

➤ **National and regional actions**

Improvements have been made in the protection of critical coastal habitats such as wetlands, through the publication of a new Standard regulating their use and through an increased program of environmental education in coastal areas.

The Clean Beaches Program has allowed the creation of Local Committees in which NGO's, academic institutions and the population in general, participate together with federal, state and municipal authorities. In May of this year an international Workshop for the exchange of information and experiences in this type of program for clean beaches included participants from the united States, Costa Rica, Chile, Brazil and Cuba.

A Red Tides Monitoring Network is currently being set up with the participation of academic institutions from all over Mexico, together with federal and local authorities and the EPA, under the auspices of the Gulf of Mexico Program. In the Gulf of Mexico itself the first buoys for satellite monitoring are now in place,

and next year it is hoped that similar buoys will be set up in the pacific.

Mexico was a participant at this year's Intergovernmental Meeting on the Action Plan for the Protection and Sustainable Development of the Northeast Pacific, contributing to the evaluation of the regional seas' situation. A general strategy was drawn up to strengthen national institutional capacities, so as to be better able to cooperate together on solving environmental problems such as ecosystem deterioration, marine pollution and urban planning in coastal regions.

➤ **General considerations**

The Mexican Pacific is an extensive area with oceanographic, climatic, geological and geographic characteristics of great interest with regard to the study of marine resources and ecosystems, and which at the same time lends itself as a key social, political and economic component in the implementation of actions aimed at furthering sustainable development. In terms of research opportunities, there is a good infrastructure of scientific and technological institutions with well trained staff, allowing the undertaking of regional and international research projects. National programs for marine mammal and turtle protection, together with the implementation of the Code of Conduct for Responsible Fishing also present opportunities for developing regional activities. The network of coastal and marine protected natural areas presents enormous potential for projects of sustainable ecotourism, as well as educational and entertainment projects at regional and international levels.

Introduction on CHINA'S Marine Economy Development Plan



Ms. Chen Yue
Photo: W.Y. Chiau

Ms. Chen Yue

*Department of International Cooperation
State Oceanic Administration*

There is one significant event this year in the history of China's marine affairs. That is the promulgation by the State Council of the National Marine Economy Development Plan in May. The Plan was drafted by the National Development and Reform Commission, the Ministry of Land and Resources as well as the State Oceanic Administration (SOA). It is of great importance for the rapid and healthy development of my economy.

The plan period is from now to the year 2010. The sea area includes internal water, territorial sea and contiguous zone, EEZ, continental shelf and other areas under the jurisdiction of the People's Republic of China.

The National Marine Development Plan mainly involves the marine industries such as fisheries, transportation, oil and gas exploration and exploitation, tourism, ship building, sea salt and chemical engineering, sea water desalination and multiple uses and bio-technology.

Why needs a plan Mainly to solve the following problems:

- the lack of an overall guideline to promote and coordinate national marine development activities;
- the sea use conflicts between various development activities;
- the relatively low technology level for marine development;
- the depletion of costal fisheries and other resources.

The Objectives of the Plan

- by the end of 2005, the whole national marine industries account for 4% of the total GDP; while in 2010 to 5% of GDP;
- the marine industries in each coastal province will reach 8% of the total GDP; and in 2010, the number will be 10% of the total GDP;

The Principles in the Plan

- to raise the total size of national marine economy by insisting the consistence of development speed and efficiency;
- to maintain the sustainable development of marine economy by balancing the development and the protection of marine environment and conservation of marine resources;
- to strengthen the role of marine science and technology in the development of marine economy;
- to readjust the whole structure of marine economy;
- to emphasis the important industrial sectors, and to promote the core industries;
- to pay equal attention to both marine economy development and national security.

Outline Sector Policies

The plan outlines the policies for different sectors, including marine fisheries, marine transportation, offshore oil industry, tourism, ship building, sea water desalination and marine biotech.

Establishment of Regional Economy Zones

It is planned to establish 11 regional marine economy zones along the mainland China coast, i.e. the east of Liaoning Peninsular (the port of Dalian), Liaohhe Delta (oil field), the west part of Bohai (tourism and the port of Qinhuangdao), the southwest part of Bohai (oil field), the Shandong Peninsular (the ports of Wingdale and Yantai), the east area of Jiangsu (sea food production and processing), the Yangzi River Delta and Zhejiang coastal areas (the ports of Shanghai and Ningbo), the southeast part of Fujian (the ports of Xiamen and Fuzhou), the north area of the South China Sea (oil exploration and exploitation, Zhujiang River Delta), the Beibu Gulf (fisheries) and the Hainan Island (tourism).

➤ The Main Measures to Develop the National Marine Economy

The following 7 measures will be taken to develop the National Marine Economy:

- To improve the legal formulation and its enforcement, and to set up appropriate institutional arrangement;
- To develop marine economy by means of marine science and technology;
- To expand various investment channels;



Photo: W.Y. Chiau

- To take advantage of local characters to promote the marine economy development;
- To pay attention to marine environment protection, therefore to ensure the sustainable development;
- To support the development of island economy by providing more financial input;
- To promote the capacity building on prevention of marine disasters, and improve marine service system.



Shanghai
Photo: W.Y. Chiau

In conclusion, the plan will play a guild role in the development of national marine economy in the near future. Each coastal province, autonomous region or municipal government will draw up its own local marine economy development plan according to the national Plan for implementation.

Concerning the domestic legal aspect, the Law on the Sea Use Management of the People's Republic of China entered into force on 1 January 2002. With 8 chapters and 54 articles in it, the Law introduces the functional zoning scheme and regulates the institutional mechanism for sea use management. It also establishes a permit system for the sea users, and the users have to pay for their usage, because the sea and its resources are public property.

It is the first year to implement the new law. The implementation of the Law helps my economy to resolve the problem of "uncontrolled" use of sea areas, and ensures the sustainability of the marine resources, as well as to promote the rapid and healthy development of the marine economy.

This year, China signed two bilateral agreements with Russia and India on the cooperation in the field of marine affairs.

The Department of Marine and Coastal Resources (DMCR) in Thailand



The department of marine and coastal resources (DMCR)

During the last centuries Thailand's natural resources have been heavily pressured by haphazard exploitations including fisheries, cultivations, industries and urban developments, misuse of land, forest destruction etc. Such increasing pressures lead to social conflicts and resource deterioration. The resulting loss in mangroves, sea grass beds, coral reefs, coastal habitats, nursery ground and biodiversity were avoidable and can be substantially reduced in the future.

It was foreseen that the management regime was fragmented and lacked integrated performance. Therefore a government agency reform took place in October 2002 leading to the creation of the Ministry of Natural Resources and Environment and the Department of Marine and Coastal Resources (DMCR). The DMCR was given the mandate to develop relevant regulations in order to achieve updated and effective managerial action with the objective to look after the nation's marine and coastal fragile and vulnerable resources including resources preservation, conservation for sustainable use and rehabilitation. Healthy resource and socio-economic integrity for future generations were also identified as an important objective.

Vision

DMCR is responsible for the management of Thailand's marine and coastal resources and maintaining of abundance, conservation, rehabilitation and

reservation of marine resources in order to maintain marine health and promote social economic integrity.

Mission

In order to achieve this vision, DMCR has been given the mandate to strengthen its capacity to carry out efficient management utilizing state of the arts technologies to reserve and conserve its marine and coastal resources for sustainable use to rehabilitate its abundance and to inspire local participation. In addition monitoring and enforcement are also to be implemented.



Mangrove Forest, Brunei
Photo: W.Y. Chiau

Authorities

- We offered an opinion to create a policy and plan to manage to conserve and revive and manage marine and coastal resources
- We offered to improve modification rules and regulations about conserve revival and manage the use of marine and coastal resources to last longer.
- It is our policy and regulations to direct, care, assess, follow-up and inspect.

➤ We study, research and develop how to conserve and revive marine and coastal resources also endangered aquatic plants and animals too.

➤ We offered to suggest the location deserved to be protected for the benefit in preserving maintain protect and control marine and coastal resources.

➤ Create understanding and promoting people to be a part in conserve and revive marine and coastal resources.

➤ We are the center of information about marine and coastal resources.

➤ Corporate with national and international organization in marine and coastal resources.

➤ Process other task that the law set up to be the department's authority or by the ministry or the cabinet.

Strategies

➤ To formulate managerial policy and planning in order to perform marine and coastal resources rehabilitation and conservation.

➤ To amend rules and regulations in order to improve operations and to cover a wider area of resource management. Actions are to focus on marine and coastal rehabilitation and conservation for sustainable uses.

➤ To supervise performance measures regarding sustainable use of resources.



Photo: DMCR's website
www.dmcg.go.th

- To encourage research on marine and coastal resources including those are rare and endangered flora and fauna in order to support conservation and rehabilitation.
- To determine the values and benefits of resource protection, preservation, conservation, restoration, and rehabilitation.
- To promote understanding and awareness of threats and degradation of marine and coastal resources and inspire public participation in resource rehabilitation and conservation.
- To serve as a focal point and networking tool for marine and coastal resource stakeholder including government academies, user groups and non-government organizations.
- To serve as an international arena on marine and coastal resources collaboration at both the international and intergovernmental levels.
- To carry out other functions assigned by law to be under the responsibilities or entrusted to the Permanent Secretary or the Ministry of Natural Resources and Environment or the cabinet.

Management Plans

DMCR was recently established following the government's agencies reformed. The activities will be performed in order to approach the management plan of the Department as follows:

➤ **Mangrove reforestation:**

In the past mangrove forest was heavily denuded and it was evident only about 1,500,000 Rai (240,000

Hectares) forest in the year 2000 including encroached areas. Since then there have been substantial reforestation efforts, which have resulted in about 15,000 Rai (2,400 hectares) being rehabilitated each year.

In 2003, under the patronage of Her Majesty the Queen Sirikit, a Royal reforestation project was launched which is currently achieving a mangrove reforestation of 20,000 Rai (3,200 hectares) in addition to normal mangrove rehabilitation. This Royal project will certainly advance along with land uses into the future. Furthermore public education and participation have been continuously promoted and encouraged.

➤ **Marine and Coastal resource management:**

It is recognized that marine and coastal resources had been encroached and have generally deteriorated. Furthermore no single solution that could ever solve this problem particularly given there are highly complex ecosystems. To understand this challenge a great deal of effort has been out into understanding this complex structure which accommodates a great number of habitats including mangrove swamp, sea grass bed, coral reef and deep water offshore areas. A great number of diversified marine life including supporting and economic species of flora and fauna. It is evident that no effective management including rehabilitation and conservation to sustain marine life could be achieved without knowing interaction of such complex structures. Those fauna and flora perform as mutual and symbiotic interaction in the system. They have a particularly important role in food chain of coastal area and sea. In order to achieve management plans, the monitoring, research and

assessment are functional performed in whole habitat system. This information will help supporting to manage, rehabilitate and conserve for the sustainable uses in the future.

➤ **Education and inspiring public participation:**

The DMCR has recognizes the importance of education to influence resource users and gain their participation in an effective management to sustain available resources into the future. Training and on site demonstrations on marine biodiversity and ecosystems will be implemented in various areas. These programs promote public awareness and demand for conservation of a healthy environment.

The DMCR's Phuket Aquarium is another powerful tool to convey massive learning and inspiring education of conservation and knowledge of the sea including endangered marine life. About 300,000 visitors visit the aquarium per year including public and school children.

Therefore roles of DMCR have become increasingly important to present day resource management.

To be effective public participation and collaboration to strengthen considerably for the sustainable use of the nation's fragile and vulnerable marine and coastal resources.

Find more information, please contact:

www.dmcg.go.th



Photo: DMCR's website
www.dmcg.go.th

World summit on sustainable Development

Plan of Implementation

(Introduction and the Excerpted Portion *for Marine Conservation)*

Introduction

➤ The United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in 1992, provided the fundamental principles and the programme of action for achieving sustainable development. We strongly reaffirm our commitment to the Rio principles, the full implementation of Agenda 21 and the Programme for the Further Implementation of Agenda 21. We also commit ourselves to achieving the internationally agreed development goals, including those contained in the United Nations Millennium Declaration and in the outcomes of the major United Nations conferences and international agreements since 1992.

➤ The present plan of implementation will further build on the achievements made since UNCED and expedite the realization of the remaining goals. To this end, we commit ourselves to undertaking concrete actions and measures at all levels and to enhancing international cooperation, taking into account the Rio Principles, including, inter alia, the principle of common but differentiated responsibilities as set out in principle 7 of the Rio Declaration on Environment and Development. These efforts will also promote the integration of the three components of sustainable development — economic development, social development and environmental protection — as interdependent and mutually reinforcing pillars. Poverty eradication, changing unsustainable patterns of production and consumption, and protecting and managing the natural resource base of economic and social development are overarching objectives of, and essential requirements for,

sustainable development.

We recognize that the implementation of the outcomes of the Summit should benefit all, particularly women, youth, children and vulnerable groups. Furthermore, the implementation should involve all relevant actors through partnerships, especially between Governments of the North and South, on the one hand, and between Governments and major groups, on the other, to achieve the widely shared goals of sustainable development. As reflected in the Monterrey

- Consensus, such partnerships are key to pursuing sustainable development in a globalizing world .
- Good governance within each country and at the international level is essential for sustainable development. At the domestic level, sound environmental, social and economic policies, democratic institutions responsive to the needs of the people, the rule of law, anticorruption measures, gender equality and an enabling environment for investment are the basis for sustainable development. As a result of globalization, external factors have become critical in determining the success or failure of developing countries in their national efforts. The gap between developed and developing countries points to the continued need for a dynamic and enabling international economic environment supportive of international cooperation, particularly in the areas of finance, technology transfer, debt and trade, and full and effective participation of developing countries in global decision-making, if the momentum for global progress towards sustainable development is to be maintained and increased.
- Peace, security, stability and respect for human rights and

fundamental freedoms, including the right to development, as well as respect for cultural diversity, are essential for achieving sustainable development and ensuring that sustainable development benefits all.

- 5bis We acknowledge the importance of ethics for sustainable development, and therefore we emphasize the need to consider ethics in the implementation of Agenda 21.

Protecting and managing the natural resource base of economic and social development

Oceans, seas, islands and coastal areas form an integrated and essential component of the Earth's ecosystem and are critical for global food security and for sustaining economic prosperity and the well-being of many national economies, particularly in developing countries. Ensuring the sustainable development of the oceans requires effective coordination and cooperation, including at the global and regional levels, between relevant bodies, and actions at all levels to:

- Invite States to ratify or accede to and implement the United Nations Convention on the Law of the Sea, which provides the overall legal framework for ocean activities;



Gandau wetland, Taiwan
Photo: W.Y. Chiau



Orchid Island, Taiwan
Photo: F.C. Chang

- Promote the implementation of chapter 17 of Agenda 21 which provides the programme of action for achieving the sustainable development of oceans, coastal areas and seas through its programme areas of integrated management and sustainable development of coastal areas, including exclusive economic zones; marine environmental protection; sustainable use and conservation of marine living resources; addressing critical uncertainties for the management of the marine environment and climate change; strengthening international, including regional, cooperation and coordination; and sustainable development of small islands;
- Establish an effective, transparent and regular inter-agency coordination mechanism on ocean and coastal issues within the United Nations system;
- Encourage the application by 2010 of the ecosystem approach, noting the Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem and decision 5/6 of the Conference of Parties to the Convention on Biological Diversity;
- Promote integrated, multidisciplinary and multisectoral coastal and ocean management at the national level, and encourage and assist coastal States in developing ocean policies and mechanisms on integrated coastal management;
- Strengthen regional cooperation and coordination between the relevant regional organizations and programmes, the UNEP regional seas programmes, regional fisheries management organizations and other regional science, health and development organizations;
- Assist developing countries in coordinating policies and programmes at the regional and

subregional levels aimed at the conservation and sustainable management of fishery resources, and implement integrated coastal area management plans, including through the promotion of sustainable coastal and small-scale fishing activities and, where appropriate, the development of related infrastructure;

- Take note of the work of the open-ended informal consultative process established by the United Nations General Assembly in its resolution 54/33 in order to facilitate the annual review by the Assembly of developments in ocean affairs and the upcoming review of its effectiveness and utility to be held at its fifty-seventh session under the terms of the above-mentioned resolution.

To achieve sustainable fisheries, the following actions are required at all levels:

- Maintain or restore stocks to levels that can produce the maximum sustainable yield with the aim of achieving these goals for depleted stocks on an urgent basis and where possible not later than 2015;
- Ratify or accede to and effectively implement the relevant United Nations and, where appropriate, associated regional fisheries agreements or arrangements, noting in particular the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks and the 1993 Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas;
- Implement the 1995 Code of Conduct for Responsible Fisheries,

taking note of the special requirements of developing countries as noted in its article 5, and the relevant Food and Agriculture Organization of the United Nations (FAO) international plans of action and technical guidelines;

- Urgently develop and implement national and, where appropriate, regional plans of action, to put into effect the FAO international plans of action, in particular the international plan of action for the management of fishing capacity by 2005 and the international plan of action to prevent, deter and eliminate illegal, unreported and unregulated fishing by 2004. Establish effective monitoring, reporting and enforcement, and control of fishing vessels, including by flag States, to further the international plan of action to prevent, deter and eliminate illegal, unreported and unregulated fishing;
- Encourage relevant regional fisheries management organizations and arrangements to give due consideration to the rights, duties and interests of coastal States and the special requirements of developing States when addressing the issue of the allocation of share of fishery resources for straddling stocks and highly migratory fish stocks, mindful of the provisions of the United Nations Convention on the Law of the Sea and the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, on the high seas and within exclusive economic zones;
- Eliminate subsidies that contribute to illegal, unreported and unregulated fishing and to over-capacity, while completing the efforts undertaken at WTO to clarify and improve its disciplines on

fisheries subsidies, taking into account the importance of this sector to developing countries;

➤ Strengthen donor coordination and partnerships between international financial institutions, bilateral agencies and other relevant stakeholders to enable developing countries, in particular the least developed countries and small island developing States and countries with economies in transition, to develop their national, regional and subregional capacities for infrastructure and integrated management and the sustainable use of fisheries;

➤ Support the sustainable development of aquaculture, including small-scale aquaculture, given its growing importance for food security and economic development.

In accordance with chapter 17 of Agenda 21, promote the conservation and management of the oceans through actions at all levels, giving due regard to the relevant international instruments to:

➤ Maintain the productivity and biodiversity of important and vulnerable marine and coastal areas, including in areas within and beyond national jurisdiction;

➤ Implement the work programme arising from the Jakarta Mandate on the Conservation and Sustainable Use of Marine and Coastal Biological Diversity of the Convention on Biological Diversity, including through the urgent mobilization of financial resources and technological assistance and the development of human and institutional capacity, particularly in developing countries;

➤ Develop and facilitate the use of diverse approaches and tools, including the ecosystem approach, the elimination of destructive fishing practices, the establishment of

➤ marine protected areas consistent with international law and based on scientific information, including representative networks by 2012 and time/area closures for the protection of nursery grounds and periods, proper coastal land use; and watershed planning and the integration of marine and coastal areas management into key sectors;

➤ Develop national, regional and international programmes for halting the loss of marine biodiversity, including in coral reefs and wetlands;

➤ Implement the RAMSAR Convention, including its joint work programme with the Convention on Biological Diversity, and the programme of action called for by the International Coral Reef Initiative to strengthen joint management plans and international networking for wetland ecosystems in coastal zones, including coral reefs, mangroves, seaweed beds and tidal mud flats.

Advance implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities and the Montreal Declaration on the Protection of the Marine Environment from Land-based Activities, with particular emphasis in the period 2002-2006 on municipal wastewater, the physical alteration and destruction of habitats, and nutrients, by actions at all levels to:

➤ Facilitate partnerships, scientific research and diffusion of technical knowledge; mobilize domestic, regional and international resources; and promote human and institutional capacity-building, paying particular attention to the needs of developing countries;

➤ Strengthen the capacity of developing countries in the development of their national and regional programmes and

mechanisms to mainstream the objectives of the Global Programme of Action and to manage the risks and impacts of ocean pollution;

➤ Elaborate regional programmes of action and improve the links with strategic plans for the sustainable development of coastal and marine resources, noting in particular areas which are subject to accelerated environmental changes and development pressures;

➤ Make every effort to achieve substantial progress by the next Global Programme of Action conference in 2006 to protect the marine environment from land-based activities.

Enhance maritime safety and protection of the marine environment from pollution by actions at all levels to:

➤ Invite States to ratify or accede to and implement the conventions and protocols and other relevant instruments of the International Maritime Organization (IMO) relating to the enhancement of maritime safety and protection of the marine environment from marine pollution and environmental damage caused by ships, including the use of toxic anti-fouling paints and urge IMO to consider stronger mechanisms to secure the implementation of IMO instruments by flag States;

Accelerate the development of measures to address invasive alien species in ballast water. Urge IMO to finalize the IMO International Convention on the Control and Management of Ships' Ballast Water and Sediment.

The Role of Aquaculture in the Conservation of Marine Resources

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Introduction

Marine resources have been continuously depleted due to the large demand for seafood by the increasing world population, coupled with water pollution problems and illegal fishing practices especially in developing countries. Asia, in particular, is the most populated continent in the world, and highest consumer of seafood products. Seafood, as an essential food in Asian diets, contributes to almost half of the animal protein consumption. In the past decade, capture fisheries production has been leveling-off, while aquaculture production is continuously increasing (Figure 1). Aquaculture also contributed significantly to the increase in total world fisheries production, the bulk of which came from Asia.

Research efforts in both fisheries and aquaculture in recent years have been focused on more environment-friendly concepts and conservation of wild fisheries stocks. The developments in aquaculture technology have definitely lessen the pressure on wild fisheries resources. Mass larval production of many important marine finfishes (e.g. grouper, seabream, flounder, yellowtail and milkfish) has resulted in the less-dependency of fish farmers in collecting fry or fingerlings from the wild. This technology also largely contributed to stock enhancement and sea ranching

programs, which are recognized as one of the most essential strategies that can sustain and increase the resources of coastal fisheries. In addition, conservation and/or restoration of some endangered species were made possible through development of mass propagation techniques under captivity, and subsequent release of mass-produced seeds into their natural habitats.

Hatcheries, nurseries and grow-out of important marine organisms have also provided solution to the degradation of the marine environment attributed to destructive fishing practices in the live reef food fish trade, aside from its primary role as potential sources for the diversification of rural livelihoods and poverty alleviation.

Environment-friendly strategies, such as the use of super-intensive recirculating system, the utilization of aquatic organisms for effluent treatment in a polyculture system, and mangrove friendly aquaculture, have greatly contributed in lessening the threat in polluting the aquatic environment and in restoration and conservation many aquatic habitats. As the demand for fish protein is incessantly increasing, aquaculture will continuously play a very important role in world seafood production as well as in the conservation of marine resources.

Problems in Fisheries Resources

The continuous decline in capture fisheries production has been brought about by many factors. One of which is the overexploitation in offshore fisheries due to the wrong concepts of ownership and inexhaustibility of marine resources. Insufficient methods applied in the utilization of resources also contributed significantly in the improper management of the wild stocks, while inadequate scientific methods failed to properly evaluate and consequently conserve biodiversity. Overfishing and coastal pollution is another problem that contributed to the decline in fisheries production. The use of illegal fishing methods (e.g. dynamite, cyanide and electric fishing) has resulted in the depletion of fisheries resources as well as the destruction of their natural habitats. Eutrophication brought about by dumping-off of organic pollutants resulted in the proliferation of toxic organisms (e.g. red tide) that caused negative impact on fishery products. This also resulted in high incidence of disease outbreaks and increased use of drugs and chemotherapeutants, that further pose risks to the environment and the consumers as well.

In order to cope-up with the deteriorating state of fishery resources, the application of biotechnology in order to augment and restore fish populations have

Marine aquaculture in Shauluchiu, Taiwan
Photo: W.Y. Chiau



been implemented to some extent. However, biotechnology application is not well understood by the public, and the introduction of genetically modified organisms (GMOs) is not yet commonly accepted for human consumption. Moreover, the release and/or escape of these GMOs in the wild might have adverse effects on the diversity of wild stocks.

With regards to capture and processing of fishery products, the fact that seafoods are generally easily spoiled once harvested, there is an inherent danger of shellfish/fish poisoning as well as bacterial and parasitic transmission, in addition to residues of chemicals and toxins, as mentioned above. At the moment, the insufficient and ineffective dissemination of food handling and processing technologies have resulted in wastage of many fishery products after harvest. The overuse of fishmeal, especially the high demand in aquaculture and livestock industries, has significantly contributed to the rapid decline in the population of “fish meal” species. Some of these species (e.g. anchovies and sardines) can even be used directly for human consumption.

Aside from environmental, practical and other problems mentioned above, there are also social and institutional problems affecting the overall fishery industry at present. These include: lack of interest among the young generation to pursue fisheries-related profession; change of food preference; poor interaction of fishery scientists and industry people; imbalance among countries in terms of resource studies and exploration; redundant research programs due to inadequate dissemination of results; decreasing international and national financial support for fisheries; and lack of interaction due to ideological differences, geographic distance and language gap.

Recommended Strategies

In order to restore and sustain the dwindling fishery resources, several strategies are needed. These include adopting environment-friendly, economically sound and responsible fisheries methods, ranching of some pelagic fishes (e.g. tuna), utilization of modern fisheries management techniques, and implementation of relevant laws and regulations. With regard to problems on overfishing and coastal pollution, the adoption of open ocean cage aquaculture is one of the novel strategies that have been proposed and implemented in many countries around the world⁽¹⁾. Moreover, the diversification of culture species as well as exploitation of other candidate species (Table 1)⁽²⁾ for aquaculture development will lessen the pressure on depleted wild stocks of the more popularly cultured species. Utilization of new technologies such as the use of deep ocean water, which is rich in dissolved organic nutrients, low levels of contaminants and huge volume, should also be properly planned and implemented⁽³⁾. Stock-enhancement and sea ranching programs, which are considered as one of the best strategies to restore and sustain fishery resources⁽⁴⁾ should be given attention in future fisheries programs.

The adoption of environment-friendly and responsible aquaculture methods, and the development of advanced technologies on disease diagnosis and treatment will definitely solve the problems due to frequent disease outbreaks. Responsible application of biotechnologies with proper dissemination of information regarding its relevance in fisheries science, as well as its impact on the environment and consumers as a whole, is urgently needed.

The adoption of strict quality control measures for fishery products, such as the Hazard Analysis and Critical Control Points (HACCP) and

traceability, will ensure safety and excellent quality of seafood products. Innovations on alternative components (e.g. plant sources) as replacement for fish meal in aquaculture feeds, and culturing of herbivorous species is necessary to lessen the pressure on “fish meal” species population. In terms of social and institutional problems, programs such as promotion of fisheries education, public awareness, development of recreational fisheries as well as local and international information exchange will definitely help the advancement of fisheries science, especially among our younger generation.

The Role of Aquaculture

Aquaculture continuously plays an important role in the world seafood production, and has significantly contributed to the increase in total world fisheries production, which has been leveling-off during almost past two decades. This was brought about by the rapid technological developments like mass larval production of important aquaculture species (e.g. grouper, seabream, flounder, yellowtail, milkfish, shrimps, crabs and shellfishes). This has resulted in the less dependency of fish farmers in collecting fry or fingerlings from the wild, thus decreasing the pressure on wild populations. It has also provided sufficient seedstocks for stock enhancement and sea ranching programs, which are recognized as two of the most essential strategies that can sustain and increase the resources of coastal fisheries. Moreover, it has lessened the pressure on the collection of ornamental fishes (often done using illegal fishing methods which destroy the reef habitats), and contributed significantly in the success on conservation and restoration of many endangered marine organisms like seahorses, abalone, and clams.

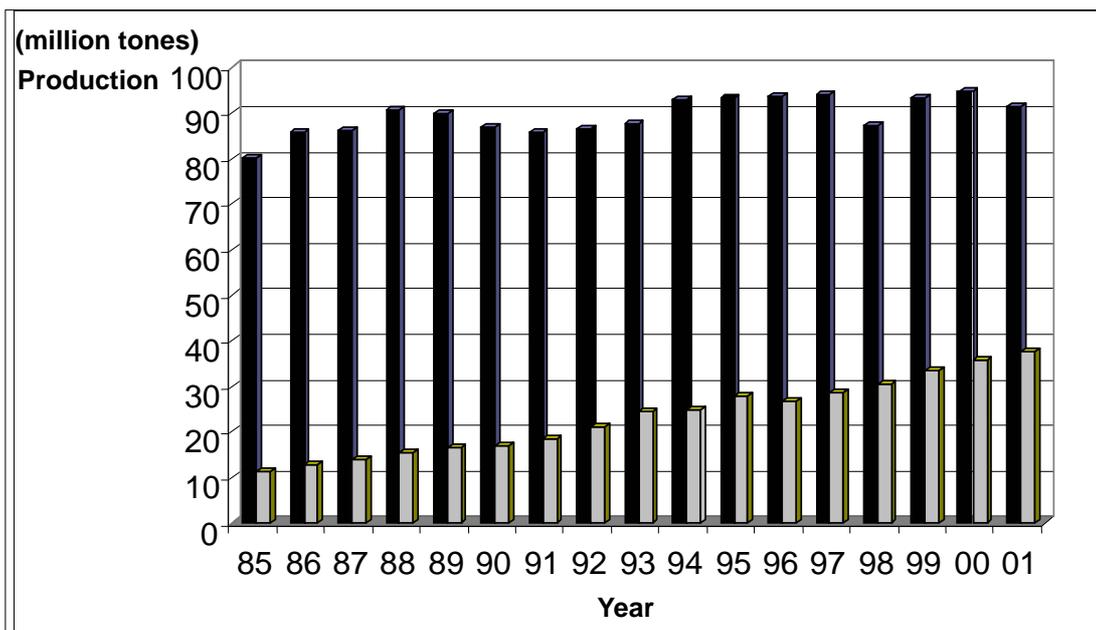


Figure1. World fisheries production from 1985-2001

■ Capture fisheries;
 ■ Aquaculture
 Source: FAO, 2002

Table1. Potential fish species for commercial culture ⁽²⁾.

Common Name	Scientific Name
FRESHWATER	
White sturgeon	<i>Acipenser transmontanus</i>
Ray-finned fish	<i>Brycon cephalus</i>
Flathead goby	<i>Glossogobius giurus</i>
Sunfish	<i>Lepomis gibbosus</i>
Golden perch	<i>Macquaria ambigua</i>
Murray cod	<i>Maccullochella peeli</i>
South American silver croaker	<i>Plagioscion squamosissimus</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
MARINE	
Atlantic wolfish	<i>Anarhichas lupus</i>
Humpback wrasse	<i>Cheilinus undulatus</i>
Small-spot porgy	<i>Dentex dentex</i>
Cardinal seabream	<i>Evynnis cardinalis</i>
Atlantic cod	<i>Gadus morhua</i>
Lemon sole	<i>Microstomus kitt</i>
Big-mouthed flounder	<i>Psettodes erumei</i>
Char	<i>Salvelinus pluvius</i>
Reticulated rabbitfish	<i>Siganus fuscescens</i>
Sole	<i>Solea solea</i>

Developments in different aquaculture systems for seafood production provided solution to the degradation of marine environment attributed to destructive fishing practices. Sustainable supply of fish protein is also ensured for human consumption while providing diversification in rural livelihoods and poverty alleviation⁽⁵⁾. The recent introduction of environment-friendly strategies has led to increased production while minimizing the negative impact on natural environment. These include recirculating systems (either intensive, super- or hyper-intensive) which reduces the use of water and minimize waste discharge, utilization of marine organisms for effluent treatment in a polyculture system (e.g. green-water culture system for grass prawn⁽⁶⁾), and mangrove-friendly aquaculture which integrate aquaculture and mangrove restoration programs⁽⁷⁾.

CONCLUSION

As the capture fisheries cannot sustain the demand for seafood of the continuously increasing human population, aquaculture will become indispensable for the sustainability of fisheries production in the world. Without the developments in aquaculture technologies, the following consequences will definitely happen:

- Insufficient supply of fish protein for human consumption;
- Total world fisheries production will continuously decline;
- Marine resources will be depleted;
- Marine habitats will be destroyed and degraded

because of the use of illegal fishing methods;

- Endangered species might finally become extinct;
- Diversity and ecological balance in the marine ecosystem will be seriously affected;
- No replenishment of harvested stocks from capture fisheries; and,
- No alternative sources of livelihood for many fishermen and coastal communities.

Fish and other aquatic organisms must be considered as nature's gifts that must be treasured and used wisely to remain available for eternity. Everyone must be contented and not make any further unnecessary demands from an already limited resource. There is only one planet called earth and its resources are not infinite, thus humans should get satisfied at some point to preserve this only inhabitable planet for us⁽⁸⁾. We must all make every effort to respect, protect and properly utilize our natural resources.

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Conservation News

MONEY GROWS ON WATER **Wetland valuation leads to more** **rational development choices** **25 July 2003**

Wetland ecosystems yield a wide range of goods and services, many of which have a high economic value. Yet, paradoxically, they have long been perceived by decision-makers as having little value - there are seen to be few economic benefits associated with wetland conservation, and few economic costs attached to their degradation and loss.

IUCN now produces seven case studies of wetland valuation that examine if and how wetland valuation changes management and development decisions. These case studies present the results of research in Muthurajawela (Sri Lanka), Barotse (Zambia), Ream (Cambodia), Waza Cameroon), Indus Delta (Pakistan), Tana River (Kenya), and Nakivubo Swamp (Uganda).

"These cases present convincing evidence. The challenge now is to ensure that these studies, and the figures they generate, are actually used in decision-making processes and influence conservation and development agendas", says Ms. Lucy Emerton, leader of the project.

The case studies aim to address the problem that the economic value of wetlands is poorly understood, rarely articulated, and as a result is frequently omitted from decision-making. The tendency to under-value is partially responsible for the rapid modification, conversion, overexploitation and degradation of wetlands.

The focus is on other, more 'productive' land and resource management options that appear to yield much higher and more immediate profits. Dam construction,

irrigation schemes, housing developments and industrial activities have all had devastating impacts on wetland integrity and status, and economic policies have often hastened these processes of wetland degradation and loss.

The case studies are produced by the project "Integrating wetland economic values into river basin management", collaboration between IUCN's Economics Programme and the Water & Nature Initiative and funded by DFID.

It aims to convince water managers that wetlands need to receive a fair share of water – to ensure they remain highly productive ecosystems that continue to contribute to water supply of sufficient quantity and quality.

More information:
<http://www.iucn.org/themes/wani/v1.html>

Scientists shocked to discover **one-kilometre-long reef of rare** **coral off N.S.** **3 Nov 2003**

Scientists probing deep waters off Nova Scotia, Canada have found a one-kilometre stretch of rare 1,000-year-old coral that could provide important insights into the Canadian marine environment.

A team of researchers found the lengthy stretch of lophelia pertusa, or spider hazard coral, at the mouth of the Laurentian Channel in late September, making it the only deepwater coral reef of its kind in Canada. "We were fascinated and we had a hard time writing down observations and punching the right keys - we were just stuck in front of the monitors gasping," Pal Mortensen, a marine biologist with the Department of Fisheries and Oceans, said Monday after presenting his findings to colleagues.

"We feared it was all gone now so it was a very, very impressive thing to find this population."

The science team returned to an area called the Stone Fence, a rocky outcrop about 400 metres under the ocean surface and east of Sable Island, after discovering a 20-centimetre piece of lophelia last year. Mortensen said they knew the coral builds reefs, but they had no idea they would find one in the heavily fished area off Nova Scotia.

The coral, a creamy white, finger-like protrusion with tentacles, can construct reefs up to 35 metres tall and 500 metres long. In some parts of the world, scientists have found continuous reefs up to 15 kilometres in length and 9,000 years old.

Nova Scotia has about 25 species of deepwater coral off its shores, but none build reefs like those found in southern climates. Researchers have found strains of lophelia in waters off Norway, Scotland and other parts of Europe, but have never spotted a live piece in Canada.

But the population is in danger of dying off as it gets shorn from the ocean's bottom by fishing trawlers that in an instant can pulverize species that only grow 1.5 millimetres a year.

About 90 percent of the 500-metre-wide reef Mortensen found was dead, with much of it surrounded by shattered coral rubble and mounds of brown lophelia. It's suspected that a lot of the damage was done about 30 years ago when dozens of factory freezer trawlers swept through the area, though Mortensen found signs of recent fishing.

"There has been a tremendous impact from bottom trawling," said Mortensen, who is returning to his home in Norway after studying coral populations in the province. "

Zoutzai Artificial Wetland
Tzuoying, Kaohsiung, Taiwan
Photo: W.Y. Chiau



By taking care of these habitats, we also take care of a lot of other species."

About 1,000 marine species have been found in lophelia, supporting the claim by environmentalists and fishermen that it's an important habitat for fish and organisms that thrive on the bright white growths.

Scientists are keen to protect it because it could provide crucial information on ocean temperatures and how climate change is affecting the growth and evolution of the species. Mortensen is awaiting data that will narrow the age of the lophelia and give insight into the deepwater environment.

Officials with the Department of Fisheries and Oceans and other organizations are developing a strategy to preserve the area, but Faith Scattolon said any conservation effort by fishermen would likely be voluntary.

"Really, to make these conservation measures work, we need the buy-in of the people involved," said Scattolon, regional director of the oceans and environment branch for the department.

Brian Giroux, head of the Scotia-Fundy Mobile Gear Fishermen's Association, said the move won't work and urged officials to impose a mandatory closure of the sensitive area.

"The biggest problem with the voluntary compliance is getting everybody to understand it," he said. "It's a better idea to put a buffer zone around it and just close the darn thing."

Fishermen first indicated the coral might be growing near Sable Island and in the Sable Gully when they began pulling up pieces in their nets.

More information:
http://story.news.yahoo.com/news?tmpl=story&u=/cpress/20031103/capr_on_sc/coral_discovery_1

Tropical isles such as Galapagos could become barren wastelands: report **17 Nov 2003**

Tropical islands such as the Seychelles and the Galapagos, famed for the biodiversity of their flora and fauna, are under mounting threat from humans and could turn into barren wastelands if development is not slowed.

That was the stark warning in a report published by the Swiss-based International Union for Conservation of Nature and Natural Resources (IUCN), which said habitats were being destroyed at an alarming rate, with the number of endangered species on the rise.

"Places such as the Galapagos, Hawaii and the Seychelles are famed for their beauty which owes itself to the diversity of plants, animals, and ecosystems," the IUCN said as it released its annual "Red List" of endangered species.

"The Red List tells us that human activities are leading to a swathe of extinctions that could make these islands ecologically and aesthetically barren," it said.

Tourism and agriculture were threatening biodiversity on islands in the Atlantic, Indian and Pacific oceans -- in one example, four plants growing only on the south Atlantic island of Ascension have become extinct in the past year.

"As on many other islands around the world, habitat destruction, introduced grazing animals and predation by and competition with invasive species are unrelenting. Invasive species have caused the extinction of four of

Ascension's plants that are found nowhere else on Earth," the organization said.

"Tristan da Cunha, St. Helena, Ascension and the Falkland Islands (also known as the Malvinas)... have developed their own unique suites of animals and plants that are extremely vulnerable to human disturbance."

The organization also highlighted Hawaii, where the introduction of herbivores first brought there at the end of the 18th century had severely harmed the ecosystem, as had weeds and imported insects.

"Add to this housing development, tourism infrastructure, and agriculture, and the future for the Hawaiian flora looks grim."

The IUCN placed 12,259 species on its Red List, about a 10 percent increase over 2002's figure of 11,167.

But that did not mean nature in general was increasingly under threat, rather that thousands of its researchers had placed more species on the list. Algae and lichen, for example, appear on the Red List for the first time.

The IUCN, based in Gland in Switzerland, has members in some 140 countries.

More than 10,000 internationally-recognised scientists and experts from more than 180 countries volunteer their services to its six global commissions.

More information:
http://story.news.yahoo.com/news?tmpl=story&u=/afp/20031118/sc_afp/environment_biodiversity_031118013942