THE 4TH INTERNATIONAL SYMPOSIUM ON STOCK ENHANCEMENT AND SEA RANCHING

As part of the 9th Asian Fisheries and Aquaculture Forum
Shanghai Ocean University
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Book of abstracts for
Oral and Poster presentations

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Yellow Sea Fisheries Research Institute
Welcome to the
4th International Symposium on Stock Enhancement and Sea Ranching
and the 9th Asian Fisheries and Aquaculture Forum
Shanghai Ocean University, April 21 to 23, 2011

The 4th International Symposium on Stock Enhancement and Sea Ranching is being held in China, a region where very large scale releases of cultured fishes and invertebrates are being made and have been made for the last 30 years. Large-scale releases highlight the need to understand the consequences for wild populations and ecosystem function so that releases can be designed and implemented to meet their objectives in a responsible way. Viable and responsible approaches that have met their objectives in the past may also need to be adapted to meet the challenges of changing climate and changing global economy. The Themes for the 4th ISSES and invitation of keynote speakers were developed to take these major issues for restocking, stock enhancement and sea ranching into account. The Themes for the Symposium are:

A) The role of releases of cultured animals in fisheries management: integrative evaluation
B) Modelling and assessing the effectiveness of releases for fisheries management and conservation
C) Governance and the socio-economics of release programs
D) Developing optimal release strategies
E) Interactions among wild and released animals and the ecological and genetic implications
F) Enhanced knowledge on populations and ecosystems from releases of cultured animals
G) Adapting to change: climate, habitat and socio-economics.

Four keynote topics and the keynote speakers for the 4th ISSES are Comprehensive case studies (Dr Anson Hines and Professor Cheng Yongxu); Genetic interactions between cultured and wild stock (Professor Shuichi Kitada); Perspectives on responsible approaches (Dr Ken Leber) and Evaluating the effectiveness of releases (Professor Kai Lorenzen). Further details of the keynote speakers and their presentations are given below. In addition to the keynote presentations a major overview of fisheries resources and enhancement in China will be given.

The First and Second International Symposiums on Stock Enhancement and Sea Ranching in Norway in 1997 and Japan in 2002 were instrumental in highlighting the technology and approaches needed to release hatchery-reared juveniles in a responsible way. The Third International Symposium was held in Seattle, USA in September 2006 and was a great success. The peer-reviewed Proceedings were published in 2008 in Volume 16 (1-3) of Reviews in Fisheries Science. We aim to publish the peer-reviewed papers from the 4th ISSES in this journal.

We welcome you to the Shanghai Ocean University and the Fourth International Symposium of Stock Enhancement and Sea Ranching.

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20. ECOSYSTEM-BASED SEA RANCHING IN ZHANGZIDAO IN NORTHERN YELLOW SEA

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In the past two decades, Zhangzidao Fishery Group Co. Ltd has been practicing the idealism of “ecosystem is living’ and establishing itself as a stock enhancement and sea ranching colossus in China. At present, Zhangzidao has been authorized to operate a sea area covering 1900 km² in northern Yellow Sea, and utilizes the area till a water depth of 50 meters. In recent years, about 7 billion seedlings of scallop, abalone, sea cucumber and other commercially important species were released into this area annually, at a total value of 500 million RMB. In 2010, 55 000 t scallop (Patinopecten yessoensis), 1 500 t abalone (Haliotis discus hannai), 400 t sea urchins and 550 t sea cucumber (Apostichopus japonicas) were harvested in Zhangzidao. Zhangzidao islands are composed of 9 islets, with a total land area of 14 km² only. In the past decades, Zhangzidao has evolved from a small fishery company into a world-level integrated seafood producing group corporation, from larva/seedling rearing, farming, basically by sea ranching, to processing and marketing. To implement sea ranching as the developmental strategy in Zhangzidao is based on the ecological condition, scientific considerations and targeting at sustainability. Tremendous efforts were made to optimize or improve the ecological conditions in sea ranching areas, including seaweeds planting and propagation and properly construct artificial reefs. In recent years, Zhangzidao invests around 10 million RMB each year to set up artificial reefs in her authorized sea area to improve habitats for fish and seaweeds, remediate and optimize the ecosystem for scallop, sea cucumber, sea urchin, abalone and the other economically important organisms.

21. STOCK ENHANCEMENT AND RESTOCKING IN AUSTRALIA AND OPPORTUNITIES FOR FINFISH, PARTICULARLY IN WESTERN AUSTRALIA

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In this study, we synthesise information on marine and estuarine restocking/stock enhancement programs in Australia and evaluate potential opportunities for stock enhancement, particularly in Western Australia. In Australia, the scale of restocking and stock enhancement programs in marine environments has been low relative to those of other countries, particularly Japan, China and the United States. However, since the early 1990s, a number of government and industry organisations and the Fisheries Research and Development Corporation of Australia, have made significant investments in research and development programs for the release of a variety of species. The scale of these research programs has varied from releases of tens of thousands of individuals (greenlip abalone Haliotis laevigata), barramundi Lates calcarifer and mulloway Argyrosomus japonicus), hundreds of thousands (tiger prawns Penaeus esculentus and black bream Acanthopagrus butcheri) to millions (eastern king prawns Penaeus plebejus). These research and development programs, although not yet evolving to major release programs, have resulted in increased knowledge of the population dynamics and ecology of released species and the development of bio-economic and energetic models to better plan and evaluate enhancement. Currently, research and development activities are continuing in New South Wales (mulloway and eastern king prawns), Queensland (barramundi) and Western Australia (black bream Acanthopagrus butcheri and greenlip abalone Haliotis laevigata). Furthermore, Victoria is
developing a plan for releasing juveniles in estuarine and marine environments and South Australia has developed a policy for marine and estuarine stock enhancement. Policies on stock enhancement are being considered for development in New South Wales and Western Australia.

The development of policies for stock enhancement in many of the Australian states has been a result of increasing coastal populations and fishing pressures in major urban centres. Interest in marine stock enhancement has increased in recent years, particularly from recreational fishers and the establishment of recreational fishing licenses in some states is providing a funding mechanism for enhancement programs. In Western Australia, major developments of energy resources are taking place in the sub-tropical and tropical marine environments, and this includes massive increases in infrastructure support e.g. ports and housing. Developers are required to purchase environmental offsets as part of the development process and funds from the offsets are being considered for the establishment of artificial reefs and stock enhancement programs. The Department of Fisheries WA lead a delegation to South Korea and China to explore the potential application of technology for artificial reefs and enhancement to be applied in Western Australia. Future opportunities and prospects for stock enhancement in Australia will be discussed.

22. ECOLABELLING AND ENHANCED FISHERIES: INTERNATIONAL GUIDELINES

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The use of market forces through ecolabelling and certification of fisheries and fish products is being promoted as one strategy to encourage sustainable fisheries. A variety of voluntary ecolabelling schemes have been established by governments and private groups that set standards to assess the performance of how a fishery is managed and how its products are handled. These schemes generally require a third party to assess the environmental impacts of a given fishery on the "stock under consideration", and the integrity of the chain of custody (traceability) in order to award an ecolabel, i.e. certify the fishery. The Food and Agriculture Organization of the United Nations (FAO) has established guidelines and standards for the ecolabelling of fish and fishery products from marine capture fisheries and guidelines for inland capture fisheries were adopted by the 29th Session of the FAO Committee on Fisheries in February 2010. Although the marine and inland capture fishery guidelines are similar, they differ in regard to fishery enhancements. Enhancement may entail stocking with material originating from fish culture installations, translocations from the wild and habitat modification. Enhanced fisheries are part of the continuum of fish production systems at one end of which are capture fisheries operating only on naturally produced fish stocks and at the other end are aquaculture facilities that control every phase of the organism’s growth and reproduction with very little reliance on the surrounding ecosystem. Most ecolabelling and certification schemes specify whether they apply to capture fisheries or aquaculture and it is difficult to classify a production system that has components of both capture fisheries and aquaculture, e.g. culture-based fisheries. The use of enhancements is common in inland fisheries and, according to expert advice given FAO, under specific conditions enhanced fisheries can be within the scope of fisheries covered by the inland capture fishery guidelines. The marine capture fishery guidelines do not yet specifically address enhanced fisheries, though the related scope and minimum substantive requirements in the inland capture guidelines seem to be equally applicable to marine fisheries.

What kinds of enhanced fisheries are within the scope of international guidelines?

The scope of the inland capture fishery guidelines extends to enhanced components of the "stock under consideration" provided that a natural reproductive stock component is