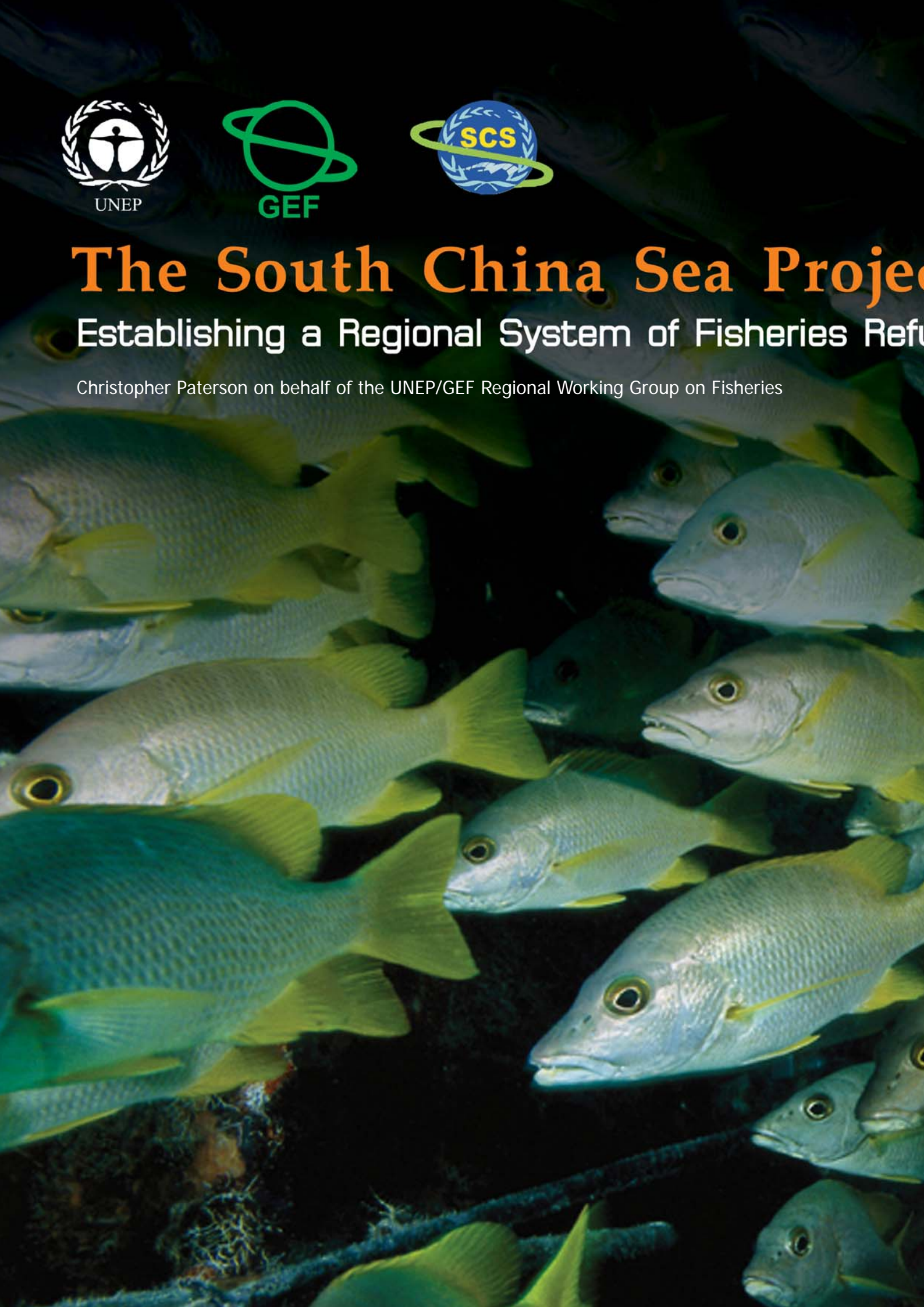




# The South China Sea Project

## Establishing a Regional System of Fisheries Refuges

Christopher Paterson on behalf of the UNEP/GEF Regional Working Group on Fisheries







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The UNEP/GEF project '*Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand*', known as the South China Sea Project, has recently entered its operational phase, and the project's fisheries component has begun developing momentum towards achieving one of its key objectives, the development of mechanisms to improve the integration of fisheries and habitat management in the South China Sea and the Gulf of Thailand. This article is the first in a series from the South China Sea Project to appear in *Fish for the People*, and aims to introduce the regional fisheries community to the project and its key fisheries activity of establishing a regional system of fisheries '*refugia*'.

### **The South China Sea Project: a vast network**

The South China Sea Project is unique in that it represents the first attempt to develop regionally coordinated programmes of action designed to reverse environmental degradation, particularly in the area of coastal habitat degradation and loss, halt land-based pollution and address the issue of fisheries over-exploitation. It is funded by the Global Environment Facility (GEF), and is being implemented by the United Nations Environment Programme (UNEP) in partnership with seven riparian states<sup>1</sup> bordering the South China Sea.<sup>2</sup>

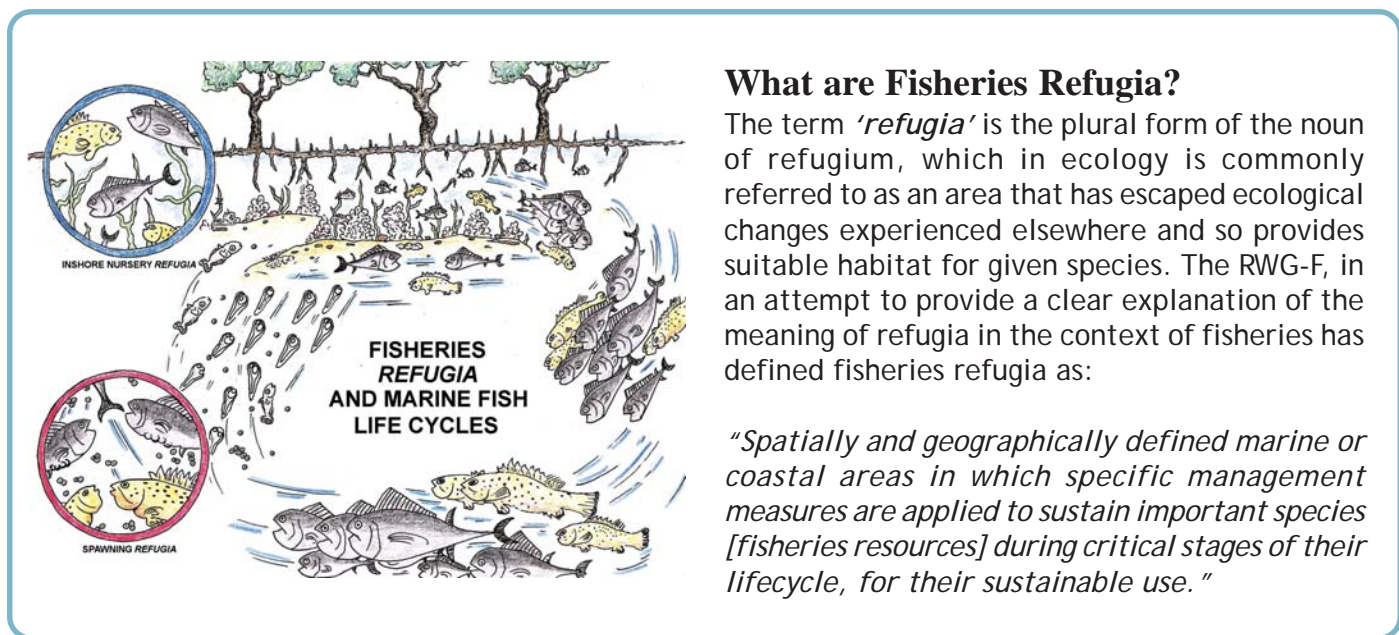
The complexity of the project has enabled the establishment of a large and expanding partner network. A total of thirty-one government-designated institutions or organizations have signed Memoranda of Understanding (MOUs) with UNEP to act as Specialised Executing Agencies (SEAs) for the project, and most SEAs have sub-contracted national institutions to assist in the completion of project tasks. This has resulted in more than 100 institutions in the region being directly involved in the execution of project activities, and more than 400 institutions involved through individual participation in meetings and national level activities.

### **The Benefits of Networking**

The project structure emphasises and fosters networking in several different ways. The opportunities for groups of specialists from each country to meet together is perhaps the simplest. Through the project structure, they meet not as individuals but as representatives of the community of specialists in their country. Hence they serve as a conduit for ideas and information in two directions: upward from the national to the regional, and downward from the regional to the national. Too frequently, large-scale projects, if they create any kind of forum for scientific and technical specialists to meet, do so in the form of a single body advising the single political

1 These states are Cambodia, China, Indonesia, Malaysia, Philippines, Thailand and Vietnam.

2 The term 'South China Sea' is used in its geographic sense and does not imply recognition of any territorial claims within the area.



## What are Fisheries Refugia?

The term '*refugia*' is the plural form of the noun of refugium, which in ecology is commonly referred to as an area that has escaped ecological changes experienced elsewhere and so provides suitable habitat for given species. The RWG-F, in an attempt to provide a clear explanation of the meaning of refugia in the context of fisheries has defined fisheries refugia as:

*“Spatially and geographically defined marine or coastal areas in which specific management measures are applied to sustain important species [fisheries resources] during critical stages of their lifecycle, for their sustainable use.”*

decision-making body. The flaws in such structures are not immediately obvious since those deciding on project design features rarely consider the range of scientific information that is necessary to provide a sound basis for environmental decision making.

A committee of scientists of twenty people, for example, is unlikely to contain adequate specialist knowledge with respect to each project component and the differing socio-economic, legal and environmental situations in all seven countries. Putting coral reef biologists, mangrove foresters and seagrass scientists together will not result in sound advice on coastal habitat management, since the nature of the environmental and ecological processes in these three systems, their use by human populations, and the management measures required for their sustainability are fundamentally different, and frequently not part of the shared body of ecological knowledge.

By creating a more specialised lower level forum, the opportunity exists to consolidate a wider body of highly specialised knowledge and experience before sharing it with specialists having other, often very divergent interests and concerns. Thus not only are the mangrove scientists networked together but also, they are linked to and networked both nationally and regionally with other habitat specialists, pollution experts, fisheries specialists, lawyers and economists. By having each regional entity working together, the opportunities for learning are expanded with, for examples, the economic forum providing advice on matters such as economic evaluation to the biologists, and the legal specialists providing advice to the national committees regarding the needs for strengthening of the national legal regime.

## The Fisheries Component

The key themes emerging from the fisheries component of the project relate to the important role that coastal and marine habitats of the Gulf of Thailand and South China Sea play in sustaining regional fisheries, and the general low level coordination between fisheries and environmental management in the region. The partner network created

through this project provides an ideal basis for efforts to improve the integration of environmental and habitat considerations into regional fisheries management, and the project activity of establishing a regional system of fisheries *refugia* aims to provide a conduit for this. The fisheries refugia activity is being implemented in close collaboration with the Southeast Asian Fisheries Development Center (SEAFDEC). The Center brings expertise and support to the project in all aspects of fisheries science, policy and management.

## Preparatory Phase Outputs

A key substantive output associated with the completion of the tasks in the preparatory phase of the fisheries component consists of the National Reports on 'Fish Stocks and Habitats of Regional, Global and Transboundary Significance in the South China Sea'. These reports have consolidated national level information on:

- The fisheries sector, including community dependence
- Species of regional, global or transboundary significance
- The importance of species in terms of landings, value, status and food security
- The biology and ecology of the priority species
- Fishery status and threats
- Habitats and areas of importance in the maintenance of exploited fish stocks, and
- Current management regimes.

The countries participating in the project now have a useful foundation for the identification and evaluation of approaches to fisheries management at both the national and regional level. The activity has also built the institutional capacity of individual SEAs to contribute to the development of the system of *refugia*, including the identification of areas of critical importance to the life-history of commercially important species.

## Regional Fisheries Management and Fisheries Refugia

The Regional Working Group for the Fisheries Component (RWG-F) has identified that regional initiatives in the development of sustainable fisheries, including the decentralisation of fisheries



management, the use of rights-based approaches to small-scale fisheries management, and the improved use of statistics and indicators, could benefit from enhanced use of fisheries management approaches aimed at:

- maintaining the habitats upon which fish stocks depend, and
- minimising the effects of fishing on stocks of important species in areas and at times critical to their life-cycle.

The fisheries *refugia* activity of the project aims to fill this gap by building regional capacity in the use of area-based or zoning approaches to fisheries management that focus on fish life-cycle and habitat linkages. It also intends to build on the SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia with emphasis on item 7.6.4 ADD. 1 on Responsible Fishing, which states that,

*“(8) States should consider area or seasonal closure to protect critical stages of life cycle of fisheries resources”*

The activity also builds upon item 7.6.9 of the Regional Guidelines on Wastes, Discards, and Ghost Fishing, which states that in terms of taking appropriate action to minimise waste, discards, catch by lost or abandoned gear, catch of non-target species, both fish and non-fish species, and negative impacts on associated or dependent species, in particular endangered species:

*“(2) States should strongly implement management measures such as closed areas and seasons in critical habitats (e.g. coral reefs, seagrass beds, mangrove areas, etc.) which are important for sustaining fish stocks.”*

The promotion and use of fisheries *refugia* in the Gulf of Thailand and South China Sea is largely aimed at improving the use of area-based approaches to fisheries management that better reflect the dependence of fisheries on critical habitats. In terms of the development of responsible fisheries, *refugia* may assist in:

- minimising the capture of juveniles and spawning stock
- reducing the use of inappropriate fishing gears and practices in critical habitat areas
- improving the integration of fisheries and habitat management, and
- resolving conflicts between small-scale and large-scale fisheries.

### Implementing Fisheries *Refugia*

The RWG-F identified that in order for the *refugia* concept to be successfully implemented in regional fisheries management, they should:

- Not be no-take zones
- Have the objective of sustainable use for the benefit of present and future generations
- Provide for some areas within *refugia* to be permanently closed due to their critical importance to the life cycle of a species or group of species
- Focus on areas of critical importance in the life cycle of fished species, including spawning, and nursery grounds, or areas of habitat required for the maintenance of broodstock
- Have different characteristics according to their purposes and the species or species groups for which they are established and within which different management measures will apply, and
- Have management plans.

The RWG-F has also highlighted that the development and implementation of fisheries management systems for fisheries *refugia* should be based on, and be consistent with, the FAO Code of Conduct for Responsible Fisheries and the SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia. The group identified that the specific management measures for fisheries *refugia* could be drawn from the following [non-exhaustive] list:

- Exclusion of a fishing method (e.g., light luring, purse seine fishing)
- Restricted gears (e.g., mesh size)
- Prohibited gears (e.g., push nets, demersal trawls)
- Vessel size/engine capacity
- Seasonal closures during critical periods
- Seasonal restrictions (e.g., use of specific gear that may trap larvae), and
- Limited access and use of rights-based approaches in small-scale fisheries.

### The Difference between Fisheries *Refugia* and Marine Protected Areas

The reports of the meetings of the RWG-F highlight that there was initially some misunderstanding of the difference between fisheries *refugia* and Marine Protected Areas (MPAs). During 2005, the project's Regional Scientific and Technical Committee requested the RWG-F to define the relationships between *refugia* and MPAs and to consider how the latter could be used as *refugia*.

In this connection, the South China Sea Project have the potential to assist in limiting the impacts of over-exploitation, and may enhance yields in adjacent fisheries. However, it was recognised during the planning phase of the project that the ecological criteria commonly used for MPA site selection, such as biodiversity, uniqueness, and vulnerability, may result in the establishment of MPAs that have little influence on the state of regional fisheries. On the other hand, the core objectives of fisheries *refugia* are to minimise the impacts of high fishing effort levels at times and in places when fish populations are particularly vulnerable to the effects of fishing, such as when they are spawning or utilising inshore areas for feeding and/or protection from predators.

The fisheries *refugia* concept is based on the use of criteria for site selection that relate directly to life-cycle and habitat linkages and the concept of sustainable use. It has been recognised that the use of fisheries *refugia* may result in some of the conservation benefits that the use of MPAs typically aims to achieve, although there is a common understanding in the project that *refugia* should not be promoted as substitutes for MPAs. From the fisheries perspective, the difference between no-take MPAs and sustainable use fisheries *refugia* should be clearly communicated to local government officials and coastal communities, as the fishery and critical habitat linkages intrinsic to the fisheries *refugia* concept may be more easily accepted by stakeholders than MPAs.

### Identifying Candidate *Refugia* Sites

In order to provide a clear and simple framework for the initial development of the *refugia* system, the identification of candidate sites will be based on determining where and





when important species are particularly vulnerable to the effects of fishing. Given that the impacts of fishing are often greatest in areas where there are high abundances of (a) stock in spawning condition, or (b) juveniles and pre-recruits, identification of spawning and nursery areas will be the initial priority.

At the most general level, identification of fisheries *refugia* in the Gulf of Thailand and South China Sea must consider the life-cycle of species for which these areas are being developed, the types of *refugia* scenarios that relate to the species for which they are being developed, and the location of natural *refugia* and appropriate sites for the establishment of *refugia*. Despite this, it has been noted in meetings of the RWG-F that detailed data are not available concerning the life-cycles and movements of many fish stocks. Nevertheless the RWG-F has agreed that the development of the *refugia* system should proceed, during the course of which the lack of data will become apparent, enabling identification of future areas for fisheries research.

The National Reports on 'Fish Stocks and Habitats of Regional, Global and Transboundary Significance in the South China Sea' provide some insight into existing information relating to the life-cycle of several pelagic species in areas of the Gulf of Thailand. However, there is a scarcity of biological information relating to most demersal species. SEAFDEC is currently attempting to address this problem via the inclusion of fish larval sampling programmes in their cruises to support studies of the early life history of commercially important species. It is anticipated that the capability of SEAFDEC to do such work, especially its ability to mobilise the new fisheries research vessel M.V. SEAFDEC 2, will be centrally important to the future development of the regional *refugia* system.

The project has approved the establishment of 24 habitat demonstration sites bordering the Gulf of Thailand and South China Sea. It is apparent at this stage that there may be benefit in establishing *refugia* in the context of these sites. All of the demonstration sites have identified fisheries-related threats, including over-capacity and over-exploitation, as well as the use of destructive and non-selective fishing gears and practices. The design of appropriate areas in association with these sites may be an effective mechanism for establishing some initial *refugia*.

### Translating Talk into Action

Translating talk into action is an ongoing focus of the South China Sea Project, and essential for meeting the project objective of establishing a regionally co-ordinated approach to action aimed at reversing environmental degradation trends in the South China Sea and Gulf of Thailand. As such, the fisheries component, led by the RWG-F, has embarked on a two-track approach to the identification of candidate sites of fisheries *refugia*.

The first track involves a review of known spawning areas for pelagic and invertebrate species, with the aim of evaluating these sites as candidate spawning *refugia*. Information regarding the spatial dynamics of pelagic fish and invertebrate populations, oceanographic features, fish behaviour, and fishing effort dynamics will be used to determine the optimum locations and sizes of spawning *refugia*. The second track is the evaluation of each of the project's habitat demonstration sites as potential juvenile *refugia* for important demersal species. The RWG-F will convene from 16 to 18 May 2006 with an aim of identifying

a suite of candidate sites that project focal points can present to government and community consultations on the establishment of *refugia* in national waters. The RWG-F will re-convene in late 2006 to discuss the outcomes of national consultations and to plan for formal government approval of *refugia* during 2007.

### Readings

ASEAN-SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia: Supplementary Guidelines on Co-Management using Group User-rights, Fisheries Statistics, Indicators and Fisheries *Refugia*, published by SEAFDEC Secretariat, March 2006.



### ABOUT THE AUTHOR

**Christopher Paterson** is the Fisheries Expert in the Project Co-ordinating Unit of the UNEP/GEF South China Sea Project. He began his career working in the field of fishing gear selectivity, and from 1997-2002 was employed as a Lecturer in Marine Policy and Management with the Faculty of Fisheries and Marine Environment at the Australian Maritime College. Prior to joining the South China Sea Project in 2005, he worked briefly with SEAFDEC's Training Department. For more information about the South China Sea Project visit [www.unepscs.org](http://www.unepscs.org).

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