



SEAFDEC/UNEP/GEF South China Sea Fisheries Refugia Initiative



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Fisheries of the South China Sea

Fish stocks critically important for food security, income, and foreign exchange



Fish production from SCS \approx 10% of global production



Most fish stocks fully-fished or over-fished



Future landings will decline unless total effort reduced



Difficult to reduce effort – high community dependence



- ❖ Located at centre of the Indo-west Pacific biogeographic province (global & local significance)
- ❖ 11% of the world's total mangrove is found along the margins of the South China Sea (SCS)
- ❖ ~930,000 ha of coral reef in coastal waters of the SCS
- ❖ ~78,000 hectares seagrass (~1/3 of the 60 known seagrass species)
- ❖ Significant basin-wide and intra-country variation in the richness and extent of habitat building species
- ❖ Degradation and loss of habitats is a result of a multitude of persistent and emerging threats



Status and trends in coastal habitats of the South China Sea

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ABSTRACT

The South China Sea is an area of globally significant biological diversity. The Transboundary Diagnostic Analysis prepared for this marine basin identified the issue of coastal habitat degradation and loss as a key priority issue for action. The UNEP/GEF project entitled "Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand" (SCS project) focused on these concerns through implementing a series of activities under the component on habitat degradation and loss. Important outputs of this project component were national reports on coastal habitats. This paper reviews and analyses available information from these reports and recent studies to present a review of the status and trends in coastal habitats of the South China Sea. This includes a technical summary of the best available information relating to the: distribution and extent of the dominant coastal habitats of mangroves, coral reefs, and seagrass; richness of habitat building species and hotspots of biodiversity; ranking of threats and the related rates of coastal habitat degradation and loss; and the state of coastal habitat management regimes. The use of this information in developing National Action Plans for habitats and the Strategic Action Programme for the South China Sea is reviewed. It is concluded that the science-based planning fostered by the SCS project was essential in reaching multi-lateral agreement on the regional targets and priority actions for coastal habitat management in this transboundary water body.

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1. Introduction

The South China Sea, including the Gulf of Thailand, is a global centre of shallow water marine biological diversity providing environmental goods and services critical to Southeast Asian economies. The coastal sub-regions of the nations bordering the South China Sea are home to 270,000,000 people, or 5% of the world's population, many of whom depend on the South China Sea for food and income. The high biological diversity and productivity of this globally significant marine basin is threatened by continuation of the current unsustainable patterns of use. It has also been seriously degraded in the recent past as a result of poorly planned coastal development.

The Transboundary Diagnostic Analysis (TDA) prepared for this marine basin identified the issue of coastal habitat degradation and loss as the key priority issue for action (Talaue-McManus,

2000). The UNEP/GEF project entitled "Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand"³ focused on these concerns through implementing a series of activities as part of the project component entitled "Habitat Degradation and Loss". This component comprised four sub-components, addressing the four priority habitats in the region, namely mangroves, coral reefs, seagrass, and coastal wetlands. It is important to note that the scope of the SCS project was limited to the South China Sea and Gulf of Thailand. Hence project activities, data and information collection focussed only on the South China Sea coastlines of the riparian countries. Coastal areas of participating countries that lay outside the South China Sea were excluded from consideration.

National-level project activities of each habitat sub-component included the establishment or re-vitalisation of National Committees or technical working groups to compile and review national information and data on the science and management of coastal habitats. Information and data from past and on-going research and publications were used to develop overall descriptions of the distribution and diversity of coastal habitats, define the threats to the quality and expanse of habitats, quantify rates of coastal habitat loss

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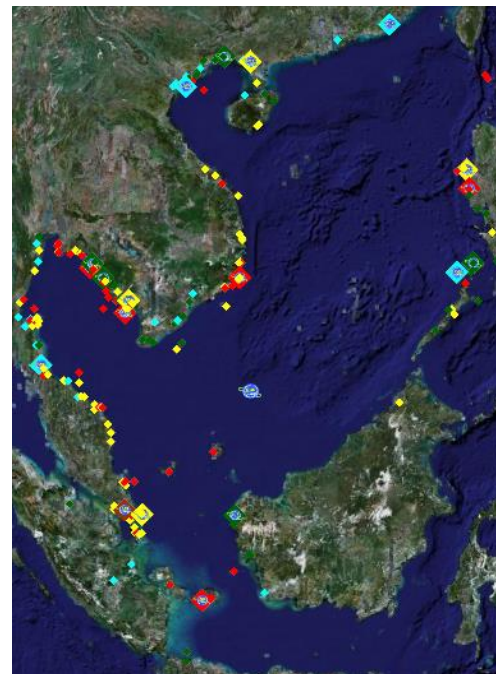
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Loss of Fisheries Habitats of the South China Sea

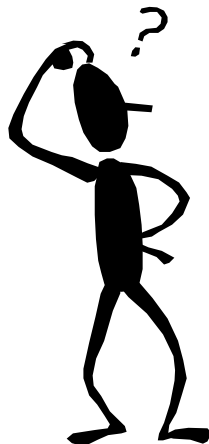
Continued decline in the total area of habitats has raised serious concerns for sustainability of fisheries

Estimated Decadal Rates of Habitat Loss:

- ❖ Seagrass – 30%
- ❖ Mangroves – 16%
- ❖ Coral Reefs – 16%
- ❖ **Fishing is a key factor in the continued loss of marine habitats and biodiversity in the South China Sea**



Fish production is intrinsically linked to the quality and expanse of coastal habitats



Dilemma for fisheries & environment sectors is that conservation of habitat does not necessarily result in increased fish stocks while lowering fishing effort does not necessarily result in the improvement of habitat



Fisheries Refugia are “Spatially and geographically defined, marine or coastal areas in which specific management measures are applied to sustain important species [fisheries resources] during critical phases of their life-cycle, for their sustainable use.”



Integrating Fisheries and Habitat Management: Fisheries Refugia in the South China Sea



Abstract: This note covers an effort to address the over-exploitation of fisheries. Increasing levels of fishing effort, coupled with continued decline in the total area of habitats critical to the life-cycles of most species, have raised serious concerns for the long-term sustainability of artisanal fisheries. Given the feed back loops between fish stock and habitat quality on the one hand, and fishing activities and habitat quality on the other it was necessary to develop a regional initiative aimed at improving the management of fish stocks and their habitats. Fisheries refugia are, “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 life cycle, for their sustainable use.” It appears that the refugia concept is a successful approach to addressing a significant barrier to effective management action that addresses fish stocks and habitats important to critical stages of the life cycle of those stocks, namely the adverse reaction to the Marine Protected Area concept that is elicited from fishing communities and fisheries officers at the local and provincial levels. It is anticipated that the experiences gained in this region will be suitable for application in other large marine ecosystems where over-fishing and the use of inappropriate fishing gear are significant impediments to more sustainable exploitation of fisheries resources. This experience is considered important because of the potential global fisheries benefits associated with effective fisheries and habitat management at the local level, which is particularly important in the case of Southeast Asia due to the continuing importance of fisheries to food security, and maintenance of livelihoods.

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Fisheries refugia: a novel approach to integrating fisheries and habitat management in the context of small-scale fishing pressure

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ABSTRACT

Fisheries of the South China Sea, including the Gulf of Thailand, are characterised by high levels of small-scale fishing effort. Increasing fishing pressure, coupled with continued decline in the expanse and quality of coastal habitats critical to the life-cycles of most species, has raised serious concerns regarding the long-term sustainability of Southeast Asian fisheries. This paper reviews the development of a UNEP/GEF South China Sea Project initiative to address the regional need to improve the integration of fisheries and habitat management.

The concept of fisheries refugia was developed as a novel approach to the identification and designation of priority areas in which to integrate fisheries and habitat management in the context of high and increasing levels of small-scale fishing pressure in the South China Sea. Specific regional, national and local actions in establishing a regional system of fisheries refugia are outlined and discussed in terms of the effectiveness of the refugia concept in overcoming barriers to integrated management. The fisheries refugia approach is shown to provide an adequate platform for building partnerships and enhancing communication between the environment and fisheries sectors.

The refugia concept also appears to be a successful approach in addressing a significant barrier to the integration of fisheries and habitat management, namely the adverse reaction to the Marine Protected Area concept that is elicited from fishing communities and fisheries officers at the local and provincial levels. It is anticipated that the experiences gained from this novel approach to the use of spatial management tools in fisheries management will be suitable for scaling-up in the South China Sea and replication in other aquatic habitats. This experience is considered important because of the potential global fisheries and biodiversity conservation benefits associated with effective fisheries and habitat management at the local level. This is particularly relevant in Southeast Asia where the contribution of fisheries to food security and the maintenance and improvement of the livelihoods of coastal fishing communities is so substantial.

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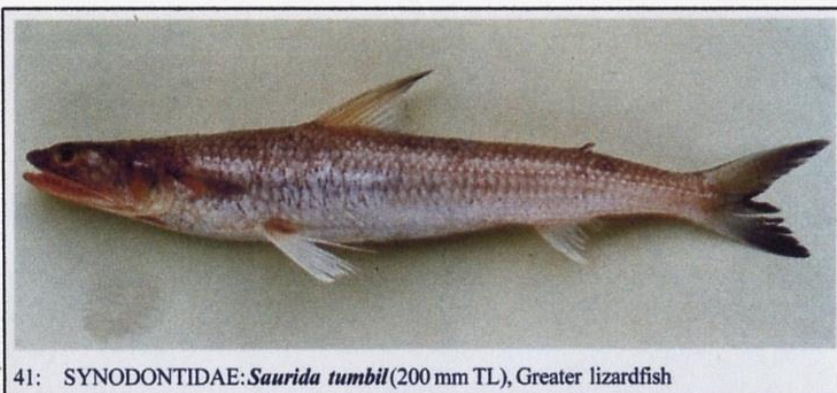
1. Introduction

The South China Sea, including the Gulf of Thailand, is a global centre of shallow water marine biological diversity that supports significant fisheries that are important to the food security and



The South China Sea Fisheries *Refugia* Project: Fish Life-Cycle and Critical Habitat Linkages

Life – History Phase	Known Habitat/ Critical Area	Threat
Early – life history	Coastal area	- Water runoff - Pollution - acidification
Juvenile	Coastal area, mangrove forest	- Mangrove deforestation - Pollution - Coastal seabed destroyed by destructive fishing gear
Pre - recruit	- muddy and sandy bottom of coastal ground	- Unselective, small mesh size fishing gear, trawler
Adult	- muddy and sandy bottom ground	- Seabed destroyed by destructive fishing gear - High fishing effort
Spawning Lm 30 cm	- muddy and sandy bottom ground	- Seabed destroyed by destructive fishing gear - Fishing during



41: SYNODONTIDAE: *Saurida tumbil* (200 mm TL), Greater lizardfish

Lizardfish (*Saurida* spp.)

Saurida elongata

Activity descriptor: Identifying fisheries *refugia* requires an understanding of the critical linkages between the life-cycles of fish species and their habitats. This inception workshop activity aims to stimulate discussion among participants of the fisheries *refugia* concept and benchmark our collective understanding of how economically important species utilize coastal and marine areas at various stages of their life-cycles. Participants are also invited to identify any known threats to fish life-cycle and habitat linkages for the species they have been assigned.



The SEAFDEC/UNEP/GEF fisheries refugia initiative is operationalizing the effective management of a network of 14 priority fisheries *refugia* sites (~270,000 ha) in the South China Sea LME by 2020







❖ **14.2** - By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans



❖ **14.4** - By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics



❖ **14.5** - By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information

