



# National PLAN

## FOR MANAGING



## THE MARINE FISHERIES OF

# The TURKS AND CAICOS ISLANDS 2005-2010



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# FOREWORD

It was approximately one year after the Chief Conservation Officer returned from completing his Masters in Marine Resource Management that the DECR set as a work objective, the revision of the Fisheries Management Plan. Roughly six months prior to this the Turks and Caicos were successful in getting a commitment from the Caribbean Regional Fisheries Mechanism (CRFM) for their assistance in preparing this document. I am therefore pleased with the joint efforts of Mr. Wesley Clerveaux and the CRFM for making this document a reality in such a short space of time. I am further moved that for the first time in the history of the TCI, a management plan for the Fisheries has been produced by local staff, in collaboration with local and regional stakeholders. The process has been a wonderful and rewarding experience for all.

The Fishery has always been an important resource to the social and economic well being of the people of this country, and no doubt it will continue into the foreseeable future. While its importance remains high, due to the advancement in technology, increasing consumption demands and the use of harmful gear, production rates are decreasing.

While there are still some healthy fish populations in the TCI, the challenge for the Department of Environment and Coastal Resources lies in its ability to manage the fisheries resources whereby it could be sustainably exploited, while simultaneously ensure maximum economic returns for the users.

The Fisheries Management Plan adequately highlights the issues affecting the sustainability of the fishing industry, focusing primarily on the main exploited fisheries resources including lobster, conch, finfish, and turtles. These issues primarily are overfishing, poaching, use of illegal gear and .... Together with the fishermen and plant operators the main management strategies to curtail these harmful actions. The DECR has always struggled with public awareness and enforcement reduction in effort and an increase in protected areas. The organization and presentation of the FMP makes it a valuable resource and a useful tool for all staff, as well as decision-makers in Government.

The World fisheries is on a decline due to fishing pressure. This situation is evident from the latest figures of the UN Food and Agriculture Organization (FAO). The depletion of stocks have given rise to a number of regional and international management efforts, including the UN Law of the Sea, the FAO Code of Conduct, UN Convention on Straddling Fish Stocks and several plans of action. Most recently the Caribbean Regional Fishery Mechanism has developed a Common Fisheries Policy.

**Judith Garland-Campbell**  
**Director**  
**Department of Environment & Coastal Resources**

# GUIDING PRINCIPLES

## Overall Mission Statement

Ensure sustainable utilisation of the natural resources of the Turks and Caicos Islands, protect and promote biodiversity and economic prosperity through a sustainable fishing industry and a protected areas system.

## Goals of Fisheries Management<sup>1</sup>

1. To manage the fisheries resources of the Turks and Caicos Islands at or above the levels necessary to ensure their continued productivity for present and future generations.
2. To minimise the impacts of fishing on the physical environment (habitats, nursery, spawning areas) and on non-target (by-catch), associated and dependent species.
3. To ensure that the levels and patterns of exploitation are determined on the basis of best available scientific information, and according to the precautionary principles.
4. To maximise the net incomes of the participants (e.g. fishers) in the respective fisheries.
5. To increase the sector's contribution to Gross Domestic Product by expanding production, through better management of existing fisheries, the promotion of new ones and the continued development of value added products for export.
6. To optimise employment and promote job creation in the harvesting and processing, and encourage use of underutilised and unutilised living marine resources, particularly in those islands that do not have many other opportunities for economic growth.
7. To ensure that the fishing industry is integrated into the policy and decision-making processes concerning the environment, protected areas and the wider developmental issues.
8. To promote and encourage the involvement and participation of stakeholders in the management of the fishery resources.
9. To ensure that the development of the fisheries sector is enhanced by regional and international cooperation (e.g. CRFM, FAO), and in keeping with international and regional obligations.

1. These goal(s)/objectives are consistent with provisions of the Third United Nations Conference on the Law of the Sea (UNCLOS II); Agenda 21 of the United Nations Conference on Environment and Development (UNCED); United Nations Agreement on Highly Migratory Stocks and Straddling Stocks; the FAO Code of Conduct for Responsible Fishing; the Convention on International Trade in Endangered Species (CITES); the Specially Protected Areas and Wildlife (SPA) Protocol; the International Convention on the Prevention of Pollution from Ships (MARPOL).

## Objectives of Fisheries Management<sup>1</sup>

- |  |  |
|--|--|
| <p>1.1 Ensure that the catch in any one-year does not exceed the Maximum Sustainable Yield.</p> <p>1.2 Restore and maintain populations of marine species to sustainable levels.</p> <p>1.3 Conserve local populations of endangered species and ensure sustainable harvesting and trade.</p> <p>1.4 Promote and enhance scientific research capabilities in order to obtain relevant information on the fisheries resources such as carrying capacity, stock status, etc.</p> <p>1.5 Enhance income generation by a factor of 15% by improving and creating market opportunities for fish and fish products at the national, regional and international levels.</p> <p>1.6 Ensure that the benefits from the exploitation of the fisheries resources are optimised by Belongers.</p> <p>1.7 Promote diversification in resource exploitation of the TCI fisheries.</p> <p>1.8 Streamline, monitor and regulate the importation of marine products.</p> <p>1.9 Establish mechanism to reduce overcapitalisation in the fishing industry.</p> <p>1.10 Develop and seek opportunities for resource users to obtain financial assistance /credit from credit agencies.</p> <p>1.11 Achieve environmental and developmental awareness of marine resources in all sectors of society from primary school through adulthood.</p> <p>1.12 Ensure that post harvest handling, processing and distribution of fish and fishery products is carried out in a manner that maintains quality, nutritional value.</p> | <p>1.13 Develop and implement food processing and handling guidelines/regulations for quality assurance.</p> <p>1.14 Improve the man-power and resources of the Fisheries Division to ensure effective monitoring, control and surveillance of fishing activities.</p> <p>1.15 Promote and maintain a “Zero Tolerance” in enforcement of the legislations.</p> <p>1.16 Develop and Implement strategies to deter and combat Illegal, Underreported and Unreported (IUU) fishing in the waters of the Turks and Caicos Islands</p> <p>1.17 Improve stakeholder participation in the management of the marine resources.</p> <p>1.18 Achieve inter and intra-agency collaboration on the matters that may affect the fisheries resources and associate habitats.</p> <p>1.19 Improve relationship with other Overseas Territories in the management of the marine resources and the environment.</p> <p>1.20 Improve TCI's collaboration and participation in regional and international initiatives in the management of the fisheries resources.</p> <p>1.21 Promote talks to delineate and conclude maritime boundaries discourse between the TCI and The Dominican Republic as well as The Bahamas.</p> <p>1.22 Develop and implement mariculture/aquaculture guidelines and regulations.</p> <p>1.23 Promote and encourage mariculture/aquaculture of indigenous species of invertebrates and fish as a means of diversifying income and diet.</p> <p>1.24 Achieve environmental and developmental awareness of marine resources in all sectors of society from primary school through adulthood.</p> |
|--|--|



# COUNTRY PROFILE

## Geography

**Location:** See figure 3, map on page 10

**Area (land mass):** 430 sq km

**Coastline:** 389 km

**Coastal Waters:** 1635 sq. km

**Maritime Claims:** 6

**EEZ (Exclusive Economic Zone):** 200 NM or territorial mid-point

**Territorial sea:** 12 NM or territorial midpoint

**Climate:** Tropical marine; predominantly moderate easterly trade winds; sunny and relatively dry

**Terrain:** Low, flat limestone; extensive marshes and mangrove swamps

**Exploited Fisheries Resources:** Spiny lobster, queen conch, and fin-fish

**Natural Hazards:** Subject to hurricanes and tropical storms.

**General Environmental Issues:** Lack of compliance with existing regulations in coastal zone development; risk of overexploitation of spiny lobster fishery resource.

## Economy

**GDP:** \$202 million (2000 est)

**Fisheries contribution to GDP:** 2.5%

**National product real growth rate:** 4.9% (2000)

**National product per capita:** \$9,600 (2000 est.)

**Inflation rate (consumer prices):** 4 % (2000 est.)

**Unemployment rate:** 10% (1997 est.)

**Industries:** Fishing, Tourism, Offshore Financial Services and Construction

**Agriculture forestry and fishing:** \$3.7 million (2000 est. in statistical handbook) Very small scale.

**Exports of Goods & Services:** \$166.4 million (2000 CDB Estimates)

**Imports of Goods & Services:** \$207.9 million (2000 CDB Estimates)

**Exchange rates:** US Dollar is used

## People

**Population:** 19,886 (2003 National Census)

**Population growth rate:** 3.14% (2003 est.)

**Ethnic divisions:** Afro-Caribbean 90%, mixed-European, or North American 10%

**Languages:** English (official)

**Literacy:**  
*Female:* 98% (1970 est.)  
*Male:* 99 %  
*Total Population:* 98%

## Government

**Type:** Constitutional Parliamentary Democracy

**Capital:** Grand Turk

**Administrative Divisions:** Centralised administration.

**Independence:** Overseas territory of the UK

**Constitution:** Introduced 30 August 1976, suspended in 1986, restored and revised 5 March 1988

**Legal system:** Based on laws of England and Wales, with a few adopted from Jamaica and The Bahamas.

**Head of State:** Queen ELIZABETH II (since 6 February 1953), represented by a Governor

**Head of Government:** Chief Minister

**Executive branch:** Executive Council consists of three ex officio members and five appointed by the governor from among the members of the Legislative Council

**Legislative branch:** Unicameral Legislative Council (19 seats, of which 13 are popularly elected; members serve four-year terms)

**Judicial branch:** Privy Council, Supreme Court; and Magistrates Court



Source: U.S. Government, World Fact Book 2002 & TCI Statistical Yearbook 2000



# FISHERIES PROFILE

## Fishing Industry

**Fishing Area:** Commercial fishing occurs mainly on the Caicos Bank. The Turks Bank is utilised mainly for subsistence fishing, supplying products to the local markets of Grand Turk and Salt Cay. Local fishers do not fish on the Mouchoir Bank, owing to the great distance of the Bank to port, but marine resources of the Mouchoir Bank are illegally exploited by foreign vessels (Fig. 3).

**Fishing Fleet:** (2002/2003 Fishing Season)

<i>Commercial Fishing Vessel:</i>	<b>219</b>	(Predominantly small open hull vessels, less than 22 ft in length, powered by outboard 75-115 HP engines. The fleet also consists of five 40-50 ft vessels that are utilised in the trap fishery and/or snapper fishery).
<i>Commercial Fishers:</i>	<b>454</b>	
<i>Sport Fishing Charter vessels:</i>	<b>41</b>	
<i>Ordinary Fishing Vessels:</i>	<b>116</b>	
<i>Resident Sport Fishing:</i>	<b>143</b>	
<i>Visitor's Sport Fishing Licence:</i>	<b>1472</b>	
<i>National Parks Licence:</i>	<b>318</b>	
<i>Unlicensed Fleet:</i>	<b>Unknown</b>	

**History of Landings:** Spiny Lobster and Queen Conch are the two main commercial fisheries of the Turks and Caicos Island. Coastal reef and deep slope fishes such as snappers and groupers are also fished, but these are targeted for the local market. The conch and lobster fishery are characterised by high fluctuations in landings. Lobster catches have been declining, with a peak of 1,312,795 lbs in 1992/1993 to an all time low of 400,375 lbs in 2002/2003.

The queen conch fishery is considered to be healthy. Since the implementation of a TAC or quota system in the mid-1990, the stocks have stabilised at exploitation level of approximately 1.6 million pounds annually (Figure 1).

**Major Landing Sites:** 5 Class "A" Processing Plants operating from Providenciales and South Caicos (some products are sold direct by fishers to other fish vending establishments, eg. to hotels, restaurants and supermarkets).

**Fish vending facilities:**

<i>Class A Processing Plants:</i>	5 (These facilities target the export market)
<i>Class B Processing Plants:</i>	4 (These facilities target the local market, but may export products after satisfying the local market)
<i>Fish Vending Facilities:</i>	55 (supermarkets, fish markets, hotels and restaurants)

**Fish Processors and Exporters:** 5 Operational Class "A" Processing Plants

- Caicos Seafood Processing Plant (South Caicos)
- Caicos Pride Processing Plant (South Caicos)
- Caicos Fisheries Processing Plant (South Caicos)
- Provo Conch and Seafood Processing Plant (Providenciales)
- LTC Fisheries (Providenciales)

**Fish Exports:** (2002/2003 fishing Season) (see figure 2)

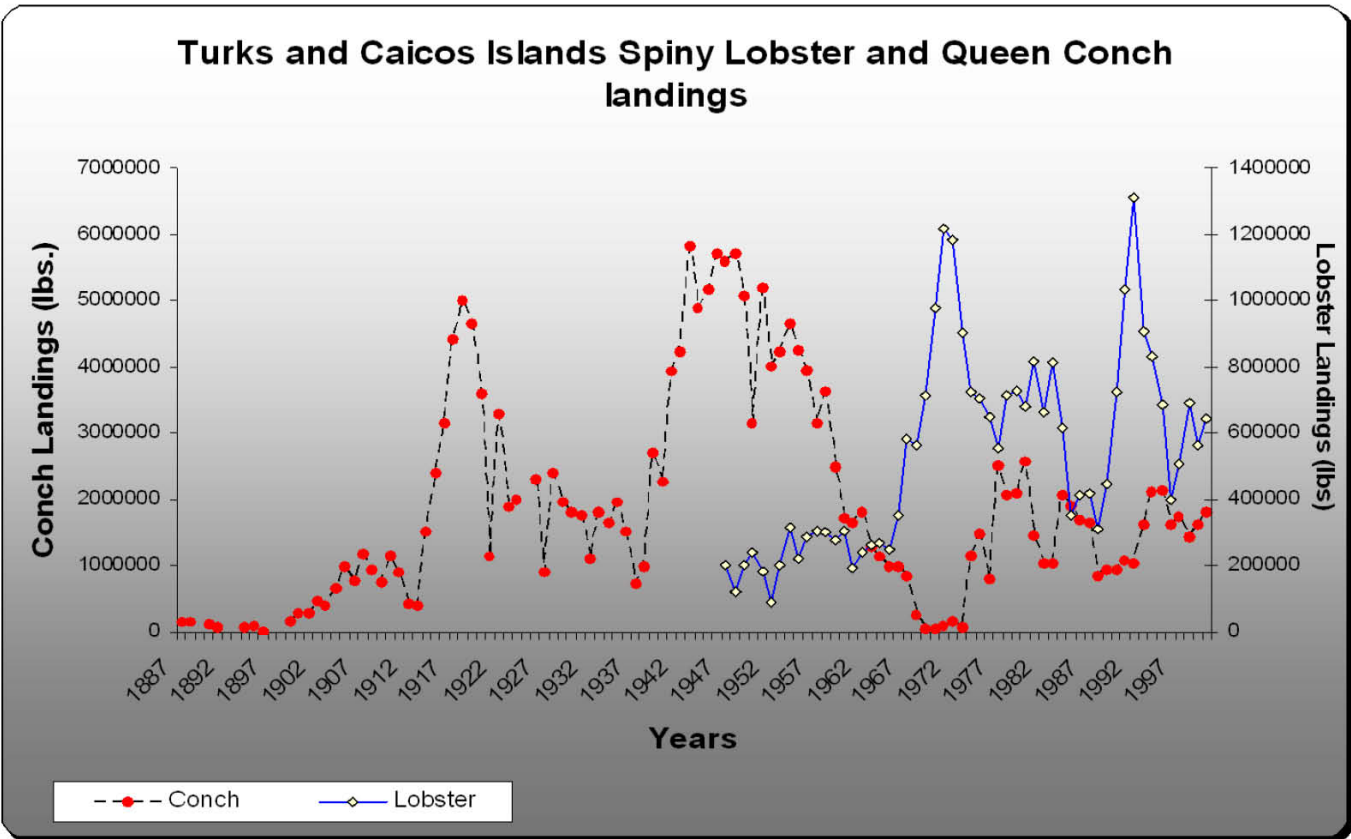


Figure 1: Historical catch landings of Spiny Lobster and Queen Conch, showing the trends and fluctuations in catch over the years.

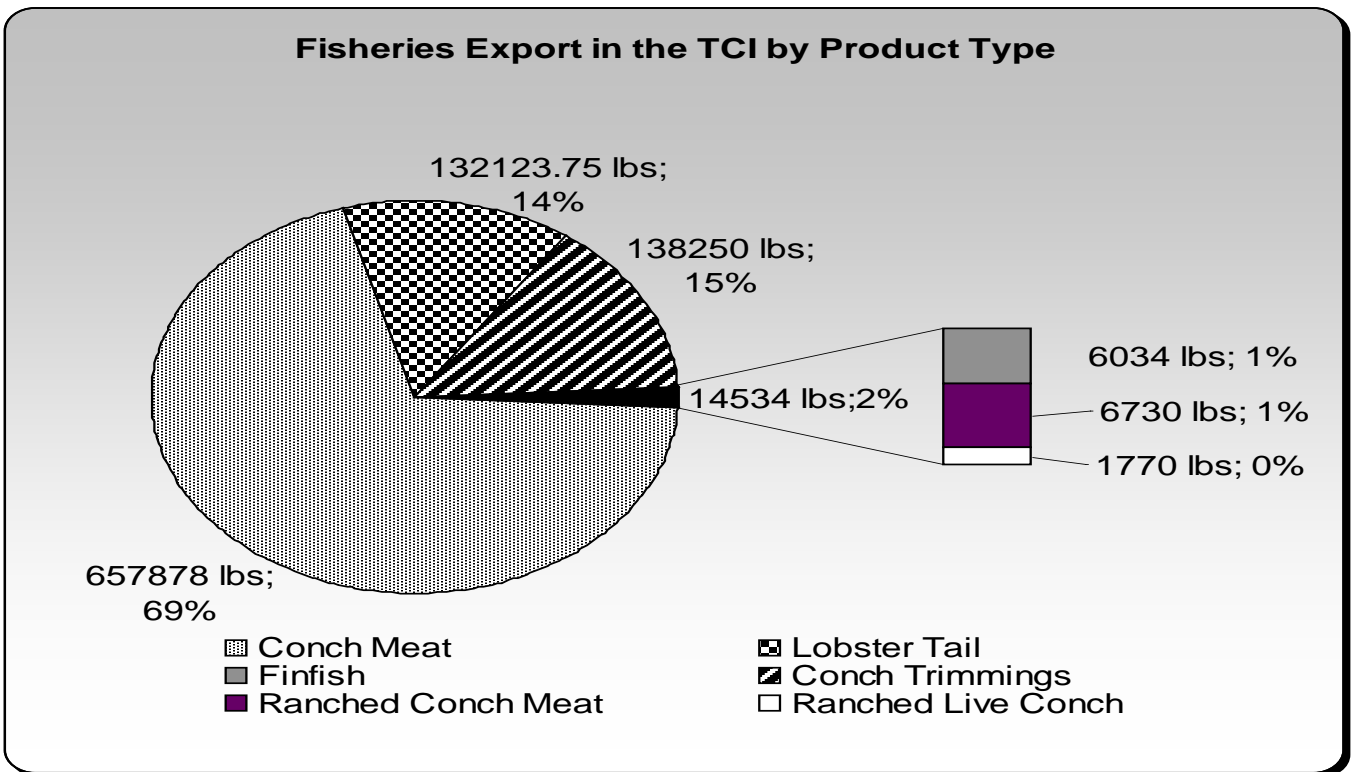


Figure 2: Marine products exported from the Turks and Caicos Islands, categorized by product type (2002/2003)



**Contribution to GDP:** 2.5% (2000 CDB estimates)

**Major Fish Importers:**

- Beaches Resort and Spa.
- Allegro Resort and Casino
- IGA Supermarket

**Fish Imported:** Salmon, crabs, shrimp, rock lobsters, New England lobsters, squid, mussels, red snappers, Yellow tail snapper, tilapia, Wahoo, dolphin

**Subsidies:**

- Import tariffs on fishing gear for commercial fishing related items are waived for holders of commercial fishing licences

**Departmental Resources:**

- Scientific Officers* 2 (scientific research)
- Environmental Officers:* 2 (public education and assist the scientific officer in research)
- Enforcement Officers:* 17
- Research Vessels:* 2
- Motor Vehicles:* 4
- Patrol Vessels:* 6
- Budget:* \$1,274,779 (2005/2006 budget)

**Other Resources Available:**

- Marine Police – Assist with patrolling of territorial waters
- Customs- Assist with inspection of exported and imported products

# Country Reference Map

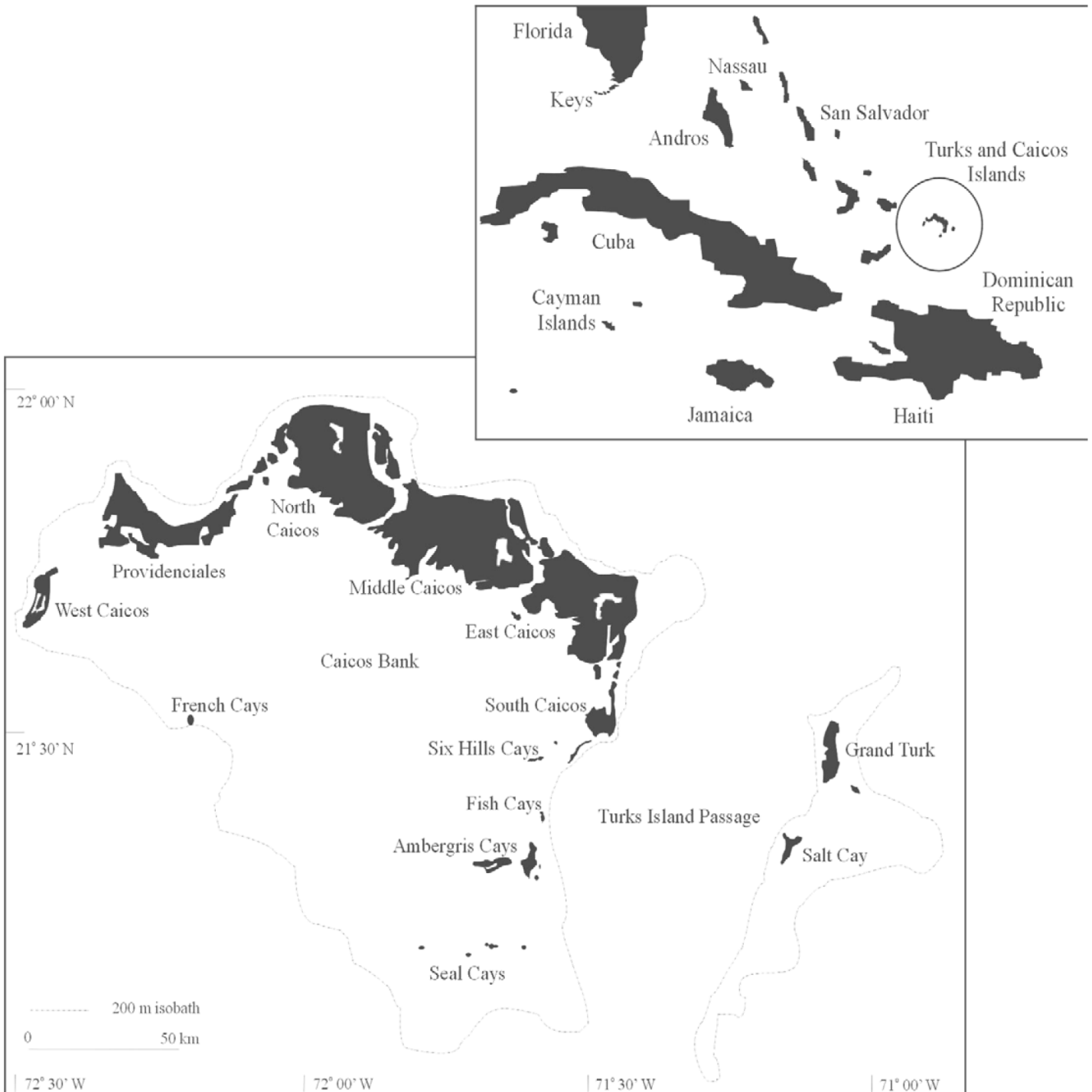
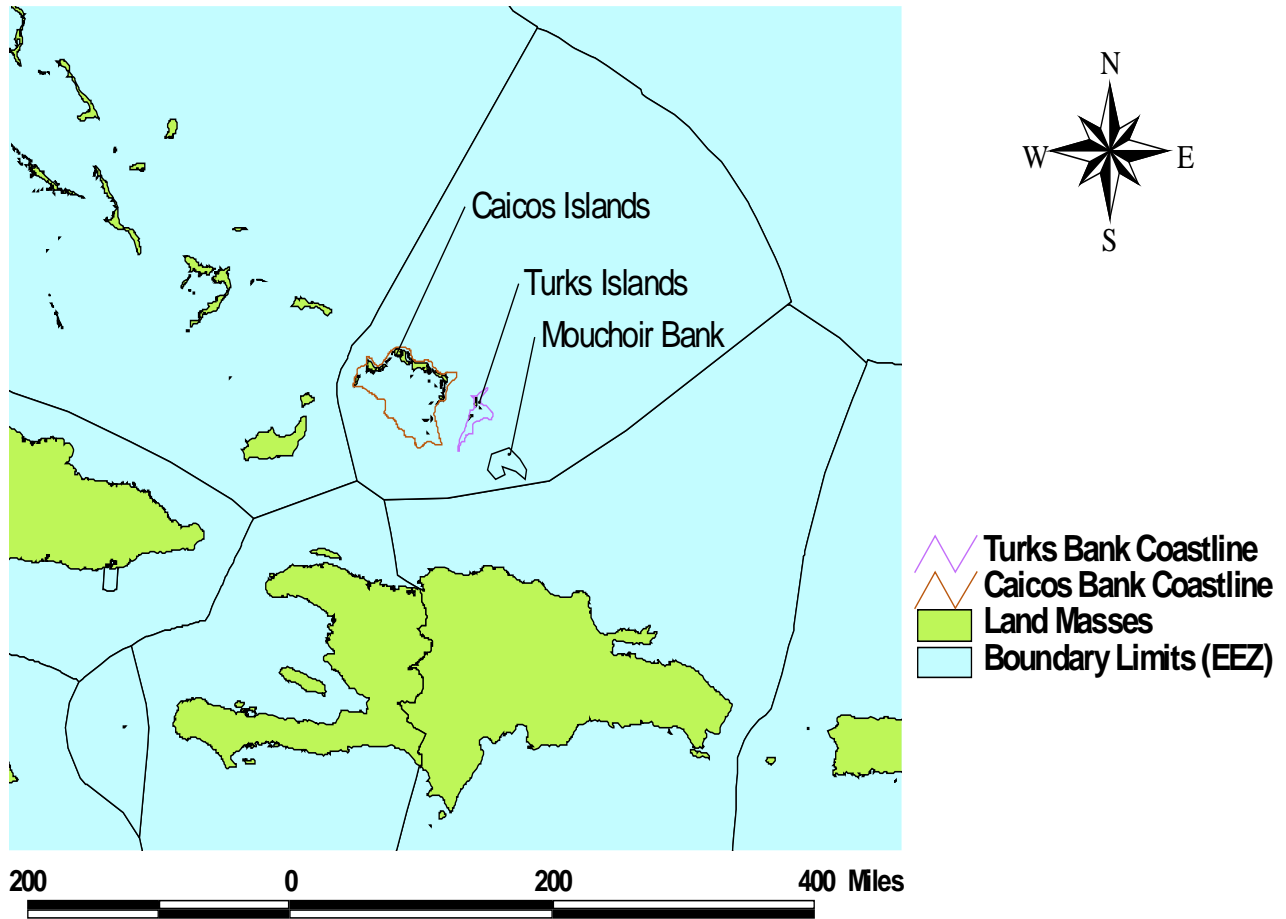


Figure 3: Map of the Turks and Caicos Islands, in relation to other islands of the Caribbean.

### Map of the Turks and Caicos Islands, its EEZ limits & the three fishing banks





# FISHERIES MANAGEMENT

## Fisheries Management Planning Process

### FORMULATION/REVISION

Fisheries Division formulates or revises draft Fisheries Management Plan (FMP)

∴

### APPRAISAL

Fishery Advisory Committee (FAC) appraises draft FMP

∴

### PUBLIC REVIEW

Draft FMP reviewed by persons involved in the fishing industry and other stakeholders

∴

### APPROVAL

Minister reviews the final draft and approves the FMP

∴

### IMPLEMENTATION AND MONITORING

Minister releases final FMP.

∴

### EVALUATION

Periodic evaluation, at least once every two to three years, by Fisheries Division, FAC, other stakeholders, and feedback from the public

# FISHERIES MANAGEMENT (cont'd)

## Coastal Zone Management Planning

The Department of Environment and Coastal Resources (D.E.C.R.) is responsible for coastal zone management. The Fisheries Division of the D.E.C.R. and the Fisheries Advisory Committee are mandated under the Fisheries Protection Ordinance Chapter 104, to manage the marine fisheries resources. Section 28 (1) of the ordinance gives instructions for the development of a management plan directed by specific guidelines.

## Fisheries Related Legislation

- Fisheries Protection Ordinance. Cap. 104: This is the main legislation which provides the legal basis and regulations for managing the fishery resources of the Turks and Caicos Islands

### Other Fisheries Related Legislation

- Fishery Limit. Cap. 105: Defines the Territorial Waters and Economic Exclusion Zones (EEZ) of the Turks and Caicos Islands.
- National Park Ordinance. Cap. 80: Provides the legal basis for the establishment and management of marine protected areas such as National Parks, Marine Reserves, and Sanctuaries.
- Coastal Protection Ordinance: This legislation combines several pieces of legislations, such as the national parks ordinance, fisheries protection ordinance and others to provide protection for the coastal zone.
- Endangered Species Bill: This legislation is currently in draft form. On completion, it will provide the legal basis for protection of endangered species in the Turks and Caicos Islands
- Wild Birds Protection Ordinance. Cap. 84: Allows for the management of ancillary species in order to protect biodiversity
- Mineral (Exploration and Exploitation) Ordinance. Cap. 79: Provides for the protection of the marine habitat from direct mining impacts or from indirect terrestrial mining activities.

## Regional/International Fishing Agreements

- CRFM (Caribbean Regional Fisheries Mechanism): TCI is a member of the CRFM which was established in March 2003.
- ICCAT (International Commission for the Conservation of Atlantic Tunas): This agency provides management advice to countries which utilize the coastal and offshore pelagic resources.

*As an overseas territory of UK, other international agreement which applies*

- **CITES** (Convention for the International Trade in Endangered Species), (See pg 15 below for details).
- **CBD** (Convention for the Conservation of Biological Diversity).
- **The Environmental Charter:** This is a formal agreement between the UK Government and the TCI Government to develop and implement sound environmental management practices. The Charter outlines the roles and responsibilities of the UK government, TCI government, the private sector, NGO's and local communities in the conservation and management of TCI's environment.

## Institutional Framework

### Governmental agencies (with key involvements in fisheries):

- Ministry responsible for Natural Resources, Department of Environment & Coastal Resources-Fisheries Unit.

### Key Officials are:

- **Minister with responsibility for Natural Resources**

- **Permanent Secretary in the Ministry.**

- **Undersecretary of Natural Resources**

- **Director of D.E.C.R. :**

- **Assistant Director/Chief Conservation Officer  
(with direct responsibility for Fisheries):**

- The Director of D.E.C.R. has overall responsibility for the implementation of policy and planning.
- The Fisheries Advisory Committee is a non-autonomous board of five members, with interests in fisheries, selected by the Minister. The role of the committee is to advise the Governor and/or Minister on managing the fishery resources of the Islands.
- The Fisheries Sub-department of the Department of Environment and Coastal Resources is responsible for implementation of fisheries policies and management in the Turks and Caicos Islands. The Sub-department is mandated to protect and improve the fisheries through effective management of the fish stocks and to promote economic prosperity for the people of the Turks and Caicos Islands.
- In order to carry out this mandate, the Fisheries Sub-department of D.E.C.R. is staffed with 11 Enforcement Officers with authority to enforce the various regulations that relate to the management of the fisheries resources. The Department is also staffed with research personnel (1 Scientific Officer) who monitor the fishery resources and provides scientific advice to the Director and the Assistant Director.
- **Protected Areas Division (PAD) of the D.E.C.R.**
  - This is a sub-division of the D.E.C.R. with special responsibility for the management of the Protected Areas of the Turks and Caicos Islands.

### Other Governmental Agencies:

- **Royal Turks and Caicos Royal Police Force:**
  - Under the Fisheries Protection Ordinance, Police Officers are deemed as Fisheries Officers, and are therefore mandated with the responsibility to enforce the regulations pertaining to fisheries.
  - The Marine Branch of the Police Force, are the main force for coastal and marine border protection.
- **Ministry of Health and Education**
  - Department of Environment and Health plays a pivotal role in inspecting fish processing facilities to ensure compliance and maintenance of health standards.
- **Ministry of Immigration and Labour**
  - The Immigration Department is responsible for repatriating fishermen of foreign nationalities who are apprehended for illegally fishing on the Banks of the Turks and Caicos Islands.
  - The Immigration Department is also charged with preventing foreign fishers, who were

apprehended for poaching in the Turks and Caicos from re-entering the country.

□ **Department of Tourism**

- The tourism department is instrumental in promoting the Turks and Caicos Islands as a sport fishing destination in order to diversify the income of fishers.

## Institutional Framework continued

### Non- Governmental Agencies:

#### **Turks and Caicos National Trust**

- This is a semi-autonomous agency which acts as the environmental watchdog of the Government for the Turks and Caicos Islands.
- More specifically, with regard to fisheries management, the Trust acts as the main agency of environmental education providing resource materials, and undertakes guest lecturing in local schools.

## Decision-making Mechanisms

### **Fishery Advisory Committee (FAC):**

- The Fisheries Protection Ordinance Cap. 104, provides the legal basis for the establishment of the Fisheries Advisory Committee (FAC). The Ordinance also gives specific guidance in establishing the committee, the terms of office of the members and the role of the committee to represent the views of the various sectors of the industry to the Governor or the Minister responsible for Fisheries.
- The FAC convenes quarterly to discuss progress in the management of the fisheries. However, the Chairman may call a meeting at anytime should a crisis occur or a problem needs to be resolved. Since the inception of the FAC, the Chief Fisheries Officer has played the role of chairman. However, since the beginning of the 2003/2004 fishing season, the Chairman is selected from within the group of five selected members. It is felt that this approach would help to promote participatory management.

### **Role of regional/international agencies:**

**The Caribbean Regional Fisheries Mechanism (CRFM):** provides support and advice on various aspects of Fisheries Management for 18 CARIFORUM countries and its major objective is to strengthen regional cooperation in Fisheries in the CARICOM region. CRFM is mandated to promote sustainable use of fisheries and aquaculture resources in and among CARICOM Member States and participating countries by development, management and conservation of these resources, in collaboration with stakeholders, to benefit the people of the Caribbean region.

**International Commission for the Conservation of Atlantic Tunas (ICCAT):** Manages the large pelagic species of the Atlantic Ocean.

**The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):** This convention regulates trade in species of flora and fauna (and products derived from such species) threatened by international trade. The Turks and Caicos Islands is in the process of developing legislations and implementing other mechanism to facilitate ratification to this convention.

### **Food and Agricultural Organization of the United Nations FAO-WECAFC:**

## Fisheries Research and Monitoring

### Monitoring Activities:

- ❑ Catch and effort data for spiny lobster and queen conch are being monitored at the landing docks. Conch catches are recorded at the docks as weight of unclean meat when removed from the shell. Lobster on the other hand, is recorded as weight of whole lobster at the time of landing.
- ❑ Export data for lobster and queen conch (including exports from the conch farm) are also being monitored. Using the CITES permit mechanism, the export of queen conchs are well documented, however, the same cannot be said for the export of other non-endangered species such as spiny lobster which does not require a CITES permit. The submission of export data prior to export is not mandatory as in the case of endangered species, exporters are therefore not as diligent in producing such information.
- ❑ The Department of Environment and Coastal Resources (Fisheries Sub-unit) proposes for the 2004/2005 fishing season to commence collecting local consumption data of marine products to determine the seafood consumption rate which will be incorporated in stock assessment models to determine the status of fish stocks in the Turks and Caicos Islands. All facilities that offer marine products for sale (e.g. restaurants, hotels, fish vendors, supermarkets etc.) will be asked to complete a predefined form and submit it to the Department monthly.
- ❑ Every four years, the D.E.C.R. Fisheries Unit conducts queen conch visual surveys of the Turks and Caicos Banks. This is a fishery independent approach of assessing the queen conch stocks and in addition cross checks the biomass results obtained using fishery dependent data in mathematical models.
- ❑ From 1992, monitoring of the morphometric measurements of spiny lobsters has been carried out at the processing plants. However, with shortage of staff and a shift in management objectives, there are some gaps in the data. Likewise, samples of queen conchs are collected from different regions of the Caicos and Turks Banks and morphometric parameters are measured.
- ❑ Data on large and coastal pelagics are collected during local fishing tournaments. This data is stored and shared with international monitoring organizations such as ICCAT and the FAO.
- ❑ Areas which are delineated and protected as fisheries protected zones are also being monitored to determine the effectiveness of these areas in increasing stock size outside the protected area zone.
- ❑ Catch data from confiscated international vessels poaching in the waters of the Turks and Caicos Islands are also monitored. These vessels usually fish on the Mouchoir Bank, and in waters which local fishers do not utilise and dare to venture to. By monitoring the catches from these vessels, the Department anticipates the use of these data to assess the status of the fish stocks in these areas.
- ❑ The Department is also actively monitoring the number of persons, number and sizes of vessels, sizes of engines, and gear types being used in each fishery through the licensing system so as to determine “effective effort” exerted on the respective fisheries.
- ❑ Although the Department have conducted numerous socio-economic surveys in the past, this research approach for the most part have been underutilised. Many of the socio-economic surveys have been in collaboration with individuals and or institutions, looking at the following:
  - Social Capital
  - Resource utilisation
  - Local consumption

## Fisheries Enforcement

- ❑ The D.E.C.R. plays a major role in enforcing the legislation and regulations that pertains to fisheries and the marine and terrestrial environment.
- ❑ Conservation Officers are tasked with the following duties:
  - ❑ Airport Inspections to ensure individuals are not entering or leaving the country with prohibited fauna or flora.
  - ❑ Landing docks, restaurant and processing plant inspections to ensure compliance with the minimum size regulations for various marine products.
  - ❑ Boarding and searching of vessels to discourage the use of prohibited gear and noxious substance.
  - ❑ Sea patrol of inshore areas
  - ❑ Joint sea patrols with the Marine Police of the EEZ
- ❑ Marine Police (all police officers are deemed Fisheries Officers)
  - ❑ Air patrols (air-wing of the Marine Police Branch)
  - ❑ Conduct sea patrols of the EEZ limit for illegal poaching and other illegal activities.
- ❑ Custom Department
  - ❑ Custom Officers are the main agency of border protection. They ensure that products (e.g. marine products, endangered species, and endemic species) are not exported or imported into the country illegally.
- ❑ Airport Security Officers
  - ❑ These officers are tasked with the duty to search persons boarding flights. Smugglers often conceal the exportation of products in small carry-on items or on their bodies.

## Registration and Licensing Systems

- ❑ Commercial fishing is reserved for only locals. All persons or vessels engaged in commercial fishing are required by law to have a valid commercial fishing/vessel license. The license is valid for one year and is renewable annually before the start of the new fishing season on August 1.
- ❑ Visiting tourists engaged in sport fishing are required by law to have a valid visitors sport fishing licence.
- ❑ Vessels that are chartered for sport fishing are required to be licensed for that purpose.
- ❑ Non-natives who are successful in attaining permanent residency status and are engaged in recreational fishing are required by law to have a resident sport-fishing license, and their vessel must have an ordinary fishing vessel license.

## Background Reading

- ❑ TCI Fisheries Management Plan (1994)
- ❑ An assessment of the deep water demersal finfish resources of the Turks and Caicos Islands.
- ❑ Turks and Caicos Environmental Charter
- ❑ Fisheries Protection Ordinance (revised 1992)
- ❑ Fisheries Limits Ordinance 1989.
- ❑ Sector Guidelines for the management and development of the commercial fisheries of the Turks and Caicos Islands.
- ❑ FAO Technical guidelines for responsible fisheries -Code of conduct for responsible fisheries



- FAO Technical guidelines for responsible fisheries -Responsible fish utilization
- FAO Technical guidelines for responsible fisheries –Fisheries Management
- D.E.C.R. (Fisheries Sub-department) – Research strategy and action plan 2004-2007

# **FISHERY-SPECIFIC MANAGEMENT PLANS**

**LOBSTER**

**CONCH**

**TURTLES**

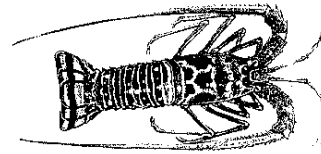
**FIN-FISH**

**(Commercially exploited fisheries, under-exploited fisheries,  
Subsistence fisheries, Non-consumption Fisheries,  
Non-extractive {Sport Fisheries})**

**MARICULTURE/AQUACULTURE**

1. The fishery-specific management plans are intended to be used in conjunction with the Scientific Research Plan 2004-2009, the Fisheries Protection Ordinance, existing Regulations or other official government documents to avoid misinterpretations of the laws or government policy.

# Management Plan for Spiny Lobster



<p><b>Target Fishes</b></p>	<ul style="list-style-type: none"> <li>❑ Spiny lobster (<i>Panulirus argus</i>)</li> </ul>
<p><b>Life History</b></p>	<ul style="list-style-type: none"> <li>❑ <i>Distribution</i> - Larvae are planktonic for about six (6) months; Juveniles inhabit shallow coastal habitats such as seagrass, mangrove, and coral rubble near the coastlines of East, Middle and North Caicos. Adults prefer deeper water and offshore reef habitats.</li> <li>❑ <i>Growth</i> - Legal size is reached by males in two (2) years and females in four (4) years. Minimum size at sexual maturity is 80-90 mm.</li> <li>❑ <i>Mortality</i> - Life span is ten (10) plus years.</li> <li>❑ <i>Spawning</i> - Peak spawning occurs in late summer to early fall, with a smaller peak in spring.</li> </ul>
<p><b>Fishing Methods</b></p>	<ul style="list-style-type: none"> <li>❑ <i>Hooking</i> : Using masks, fins and snorkels, fishers free-dive to depths of up to 20-30 meters where the lobster are caught from within their dens in which they aggregate during the day. Fishing is largely limited to lobster dens that can be located from the surface, usually in patch reefs. Lobsters are caught by impaling them on a fish hook which is attached to the end of a short fiberglass rod.</li> <li>❑ <i>Trapping</i>: Wire mesh traps are baited with conch skin (conch-slop) to attract the lobsters. Large 10-15 meter inboard powered boats equipped with powered wrenches are used to hoist the pots from the water. Similar to the smaller boats, trap boats return to port daily, but at times may elect to spend 2-3 days fishing before returning to port. It is unlawful to process at sea, as such all products caught are placed on ice and transported to port before processing.</li> </ul>
<p><b>Management Unit</b></p>	<ul style="list-style-type: none"> <li>❑ Island shelf of the Caicos and Turks Banks for juveniles and adults.</li> <li>❑ Wider Caribbean relates to the likely interactions of regional stocks through planktonic larvae.</li> </ul>
<p><b>Resource Status</b></p>	<ul style="list-style-type: none"> <li>❑ The Gordon-Schaefer and Thompson-Bell models were utilized in 2001 to assess the status of the spiny lobster stocks of the Turks and Caicos Banks. Despite slight variations, both models indicated that the fishery with a current catch of 872,081 lbs is currently operating near the Maximum Sustainable Yield (MSY) level of 835,403 lbs. (Figure 4). In addition, the high cost of fishing, resulting from elevated effort levels (current effort level 4729 man-days) has reduced the current rent (profit) derived from the fishery to an extremely low level of US\$773,295, which translate to approximately US\$1.97 per kilogram of lobster compared to the estimated potential of approximately US\$3.61/kg lobster (US\$1,092,803) at the MEY level (2852 man-days).</li> <li>❑ Both models illustrated that the TCI spiny lobster fishery as an open access system. Efforts (e.g. 2852 man-days) at the Maximum Economic Yield (<math>f_{MEY}</math>) in both models are significantly lower than effort (5703 man-days) at the Maximum Sustainable Yield (<math>f_{MSY}</math>). A slight increase in effort above <math>f_{MSY}</math> may result in the loss of profit, spiralling downward to the break-even point of zero profit.</li> </ul>

- Randomly sampling of fishermen's catch, prior to landing for the period 1989-1998 suggest that approximately 41.3 % of the landings annually are comprised of undersize lobsters. In terms of weight, this converts to over 22 % of the catch which would not be accepted by the processing plants and possibly sold to locals, and restaurants for local consumption.

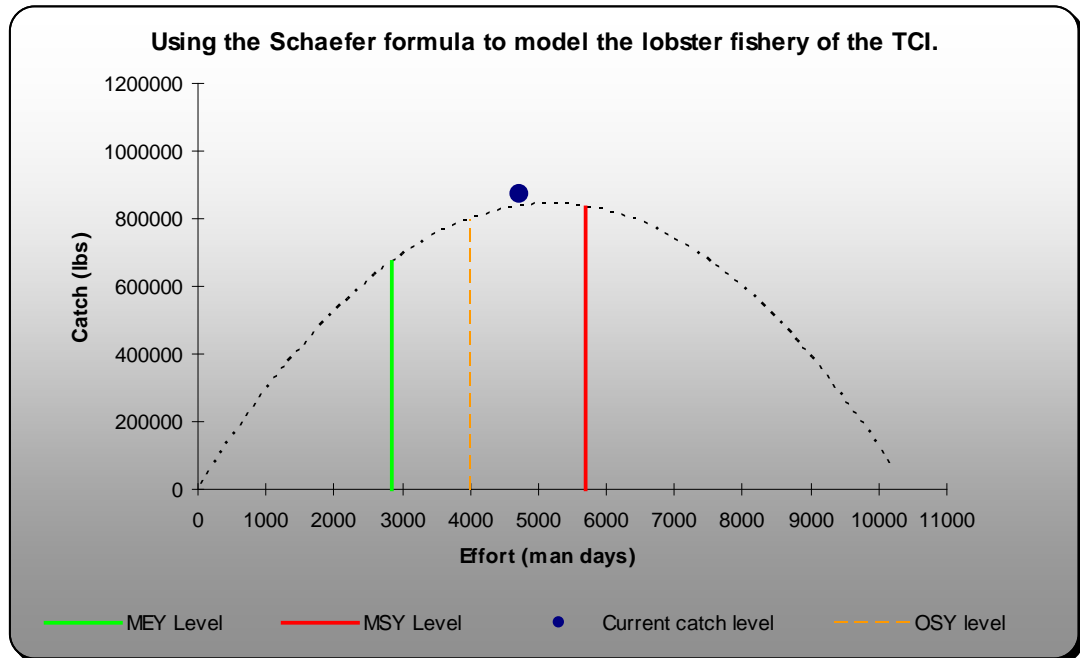


Figure 4: Graph simulating the spiny lobster fishery of the Turks and Caicos Islands. Current catch is very close to the MSY level. The TCI fishery is open access; increase in effort may cause catch to surpass the MSY limit causing overfishing.

- Over the past 20 years, the illegal use of noxious substances (e.g. bleach or joy mixed with gas) by fishermen to flush lobsters out of their dens have increased. One out of every five traps is lost by the end of the fishing season, which contributes to ghost fishing. These destructive practices are believed to have contributed to the decline in stock size.



**Catch History**

- Spiny lobster landings in the TCI have fluctuated over the years reaching a peak in 1992 at 1,312,795 lbs. (590 MT). This was followed by a decline to the current yield level of 400,375 lbs. (320 MT) for the fishing season of 2001/2002 (Figure 5 below).
- The observed fluctuation is probably related to changes in recruitment and stock size (Medley and Ninnes, 1997; Bethel et al, 2001) or to the dynamics of the fleet, which displayed a strong direct relationship between catch and effort. At the same time the catch per unit of effort (CPUE) remains relatively stable around 58-kilograms/man-day from 1985 to 2002.

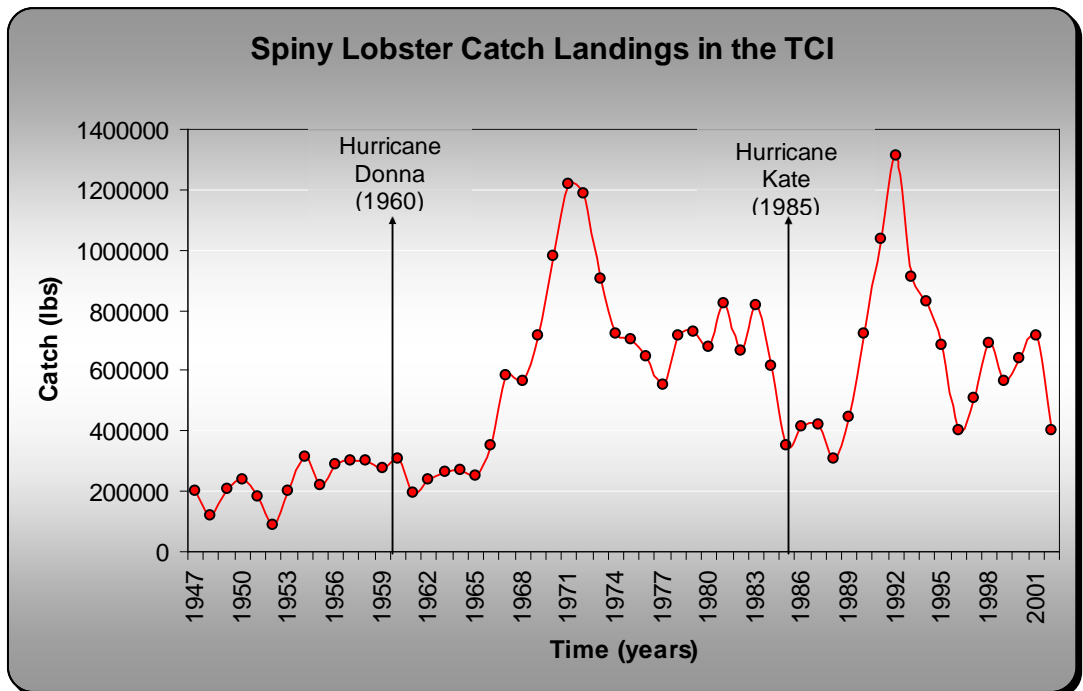


Figure 5: Graph of catch landings for the Spiny Lobster fishery of the Turks and Caicos Islands. The fishery is characterized by high fluctuations in catches, reaching a peak in 1992.

- Over 30% of the total spiny lobster catch is landed during the month of August, which is the beginning of the spiny lobster fishing season.

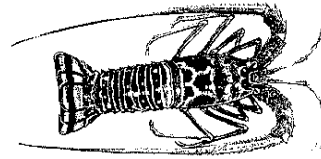


<p style="text-align: center;"><b>Current Regulations</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Minimum size limits of 3¼ inches (83 mm) carapace length measured from the front of the groove between the horns directly above the eyes along the middle of the back to the rear edge of the carapace or back shell. Or the equivalent tail weight of 5 ounces (142 g).</li> <li><input type="checkbox"/> Restrictions on fishing gear (speargun), artificial breathing devices, noxious substances, explosives or other substance or any device or thing potentially harmful to marine life.</li> <li><input type="checkbox"/> It is illegal to remove, dissolve, shift or in any way disturb any coral, sea oats, sand, rock or other substance forming part of the sea bed or any wreck within the fishery limits.</li> <li><input type="checkbox"/> It is unlawful to be in possession of any egg-bearing spiny lobster or to strip or in any manner molest any egg-bearing spiny lobster in order to remove the eggs.</li> <li><input type="checkbox"/> It is illegal to take or be in possession of any moulting or soft-shelled spiny lobster or spiny lobster which is in the early stage of spawning (described as appearing to be tar-spotted).</li> <li><input type="checkbox"/> It is unlawful to process lobsters at sea, so any person taking lobsters shall ensure that the lobsters remain in whole condition after being taken, until landed at that place in the Islands where they are to be sold, processed or used for personal consumption or for consumption in the home.</li> <li><input type="checkbox"/> Closed season for spiny lobster is the period from the first day of April to the thirty-first day of July.</li> <li><input type="checkbox"/> The East Harbour Lobster and Conch Marine Reserve (EHLCR) is a fishery protected zone in which commercial fishing is prohibited. However, hand-line fishing is allowed from the dock.</li> <li><input type="checkbox"/> A licence is required for all vessels or persons engaged in commercial fishing</li> <li><input type="checkbox"/> The legislation makes provisions for only locals, better known as 'Belongers' to commercially fish lobsters.</li> <li><input type="checkbox"/> Sport fishers are allowed a bag limit of 10 lbs. for personal consumption.</li> <li><input type="checkbox"/> Regulation on minimum mesh size of 1 ½ inches for hexagonal wire mesh or 2 inches for welded or woven rectangular wire mesh for fish or lobster pots.</li> <li><input type="checkbox"/> The legislation makes provision to reduce 'ghost fishing' by implementing a clause that all fish pots should be constructed of or contain a panel made of deteriorating/biodegradable materials, which would deteriorate after being continuously in the water for no more than six weeks.</li> </ul>
<p style="text-align: center;"><b>Management Objectives</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Ensure that the catch in any one year does not exceed the MSY.</li> <li><input type="checkbox"/> Discourage destructive fishing practices such as the use of bleach and other noxious substance in fishing.</li> <li><input type="checkbox"/> Reduce the undersize harvesting of lobster from 49% of the catch to less than 10% of the catch.</li> <li><input type="checkbox"/> Discourage Illegal, Underreported, Unreported (IUU) fishing for lobster.</li> <li><input type="checkbox"/> Improve on net exchange earnings from the lobster fishery.</li> <li><input type="checkbox"/> Promote management at the regional level in order to improve the effectiveness in managing the lobster fishery of the Turks and Caicos Islands.</li> </ul>



	<ul style="list-style-type: none"> <li><input type="checkbox"/> Improve our understanding of the spiny lobster stock status in the waters of the TCI</li> <li><input type="checkbox"/> Maintain and promote a “Zero Tolerance” policy in enforcement</li> </ul>
<p style="text-align: center;"><b>Management Strategy</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Vigorously enforce existing regulations</li> <li><input type="checkbox"/> Restrict part-time and foreign fishers from participating commercially in the lobster fishery.</li> <li><input type="checkbox"/> Prohibit restaurants from having in their possession or offering for sale lobster on their menu during the close season.</li> <li><input type="checkbox"/> Develop a local niche market for lobster derivatives in order to reduce processing waste and to improve on the resource users’ net income.</li> <li><input type="checkbox"/> Enter into bilateral and or multilateral agreements with neighbouring countries such as the Bahamas, Dominican Republic, and Cuba to improve on the management of the lobster fishery by increased enforcement and research.</li> <li><input type="checkbox"/> Enter into regional fishing agreement, involving the FAO-WECAF and/or CRFM, to foster sustainable regional management of the lobster stocks.</li> <li><input type="checkbox"/> Maintain the stock at all times above 50% of its mean unexploited level.</li> <li><input type="checkbox"/> Develop a local niche market for lobster derivatives in order to reduce processing waste and to improve on the resource users’ net income.</li> </ul>

# Action Plan for SPINY LOBSTER



Issues	Action	Implementation Strategy	Performance Indicators	Resources Required
<p>Risk of overfishing when catches surpasses the MSY level.</p>	<ul style="list-style-type: none"> <li>Establish reference points for the spiny lobster fishery.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct research to estimate the MSY and establish Target and Limit Reference points.</li> <li>Develop appropriate management strategies based on reference points approach.</li> </ul>	<ul style="list-style-type: none"> <li>By August 2006, reference points developed and implemented</li> <li>By August 2006 develop Government policy outlining remedial actions to be taken should the TRP be surpassed and or on approaching the LRP</li> </ul>	<ul style="list-style-type: none"> <li>New Computer to maintain database</li> <li>Increase in technical staff (additional Scientific Officer, to conduct research)</li> <li>Further training in stock assessment for Scientific Officers</li> <li>Increase in Staff (additional Scientific Officer)</li> <li>Funds for research</li> </ul>



<p>Increase in fishing effort, which contributes to overfishing and causes the dissipation of profits derived from the fishery.</p>	<ul style="list-style-type: none"> <li>• Limit or reduce fishing effort in keeping with management strategy developed.</li> </ul>	<ul style="list-style-type: none"> <li>• Limit foreign fishermen entering the fishery to a predetermined number</li> <li>• FAC to screen and review foreign fishermen applicants based on predefined criteria</li> <li>• Increase fee for foreign fishermen licence</li> <li>• Increase fee for commercial fishing licenses.</li> </ul>	<ul style="list-style-type: none"> <li>• Based on management strategy, reduce foreign fishers by to less than 30 by August 2005</li> <li>• License fees increased by August 2004</li> </ul>	<p>Collaborate with National Insurance to establish current employment of holders of commercial fishing licenses Ministerial commitment, FAC involvement, public education</p>
<p>The catch in some specific areas have a high percentage of egg bearing (spawning) lobsters.</p>	<ul style="list-style-type: none"> <li>• Set up restricted areas/closed during spawning season to protect egg bearing lobsters.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify locations (e.g. 'East side' ) which have high spawning populations</li> <li>• Make recommendation to protect area.</li> <li>• Create legislation</li> </ul>	<p>Conduct and complete visual survey to identify locations by end of 2007</p> <p>Define and delimit areas to be protected and implement legislations by August 2007</p>	<p>Funding for visual survey</p> <p>Increase in technical staff</p> <p>Ministerial Commitment</p> <p>A.G. Chambers to develop legislations</p>



<p>Fishing during closed season, and poaching by foreign fishers</p>	<ul style="list-style-type: none"> <li>• Discourage or curb illegal local fishing and poaching by foreign fishers.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase joint enforcement with the TCI Marine Police</li> <li>• Promote and increase information based tactical enforcement</li> <li>• Educate the local fishers and the public of the dangers of overexploiting the stocks and promote fishing only during the open season</li> <li>• Revise the legislation to make it illegal for restaurants to offer for sale lobsters on their menu during the close season</li> <li>• Develop bilateral agreements with neighbouring countries improve enforcement</li> </ul>	<ul style="list-style-type: none"> <li>• By August 2006, the number of reported illegal local fishing incidents would be reduced to less than 10</li> <li>• By August 2006, level of foreign poaching on the Banks of TCI will be reduced by 50% of the current level</li> </ul>	<p>Funds for cost of increased enforcement efforts. D.E.C.R. and FAC to facilitate town meetings to inform public of current fisheries management and development situation.</p> <p>Ministerial collaboration with senior decision makers in neighbouring countries to develop bilateral or multilateral agreements.</p> <p>AG's Chamber to draft national legislation and make inputs into the drafting of bilateral and/or multilateral agreements.</p>
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<p>Destructive fishing practices</p>	<ul style="list-style-type: none"> <li>• More rigorous enforcement of existing regulations to discourage the use of prohibited noxious substance (e.g. bleach, “joy”).</li> </ul>	<ul style="list-style-type: none"> <li>• Develop, train and distribute portable test kits to Conservation Officers to allow them to detect chemical residues on fisheries products.</li> <li>• Increase board-and search operations (in collaboration with the Marine Police) of commercial fishing vessels in search of evidence relating to the use of noxious substance.</li> <li>• Improve tactical surveillance during the lobster season.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce incidence of persons using noxious substance to fish to less than 10 convictions annually by August 2006.</li> <li>• Marked reduction in the sale of Clorox, “joy” and other noxious substances by store.</li> </ul>	<ul style="list-style-type: none"> <li>• Funds to purchase chemicals and conduct research</li> <li>• Collaboration on research with SFS</li> <li>• Joint enforcement with Police</li> <li>• Training of Officers in “Board and Search” tactics</li> </ul>
	<p>Ensure that traps utilised in the fishing industry comply with the provisions of the law to improve selectivity (i.e., escape vents, biodegradable panels) to reduce ghost fishing</p>	<ul style="list-style-type: none"> <li>• Remind and educate trap users of the provisions of the legislations.</li> <li>• Inspect all traps before deployment to ensure compliance with the legislation.</li> <li>• Conduct periodic inspection at sea, by drawing traps from the water to ensure compliance with the legislation.</li> </ul>	<ul style="list-style-type: none"> <li>• By August 2005 all traps utilised in the fishery will conform to the provisions of the legislation.</li> </ul>	<ul style="list-style-type: none"> <li>• D.E.C.R to conduct meetings with trap fishers</li> <li>• D.E.C.R and FAC to inform all other fishers</li> </ul>



Issues	Action	Implementation Strategy	Performance Indicators	Resources Required
<p>High harvesting rate of undersize lobsters. Up to 41.3% of the annual landings are estimated to be below the legal size of 3.25 inches.</p>	<ul style="list-style-type: none"> <li>Discourage and reduce undersize lobster harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>Increase number of surveillance exercises at sea and at the landing sites by the Conservation Officers.</li> <li>Increase surveillance and inspection at airports, restaurants, and hotels for undersize lobsters.</li> <li>Discourage the 'black' market for local consumption.</li> <li>Enforce the use of measuring gauges which have already been issued to all commercial fishers.</li> </ul>	<p>Reduce percentage of landed catch which are below the minimum size from 41.3% to less than 20% by 2007.</p>	<p>Funds for increased surveillance, patrols and enforcement initiatives.</p> <p>Public education program by all D.E.C.R. personnel.</p> <p>Joint enforcement with marine police.</p> <p>Funds for morphometric research at landing sites.</p>
<p>Depletion of lobster stocks in some areas</p>	<ul style="list-style-type: none"> <li>Evaluate the feasibility of using artificial habitats to rebuild depleted stocks.</li> </ul>	<ul style="list-style-type: none"> <li>Deploy and monitor a limited number of artificial habitats as a pilot project to assess whether or not these artificial habitats are increasing production or attracting lobsters from natural habitats.</li> <li>Consider areas for setting up artificial reefs as a pilot project.</li> </ul>	<p>Complete pilot research by December 2006</p>	<p>Funds to construct deploy and monitor artificial habitats.</p> <p>Increase institutional capacity.</p> <p>Collaboration with researchers in Cuba, etc.</p>



<p>Fishing in MPAs</p>	<p>Enforce existing regulations in Marine Protected Areas and evaluate the need to expand MPAs</p> <p>Evaluate and explore the use of marine protected areas as a tool for fisheries management in the TCI</p>	<ul style="list-style-type: none"> <li>• Increase patrol, surveillance and monitoring of MPAs</li> <li>• Conduct reconnaissance surveys of MPAs (RAMSAR Site and Wetlands) to identify their role in lobster stock building in the TCI.</li> <li>• Develop action / management plan for EHLCR.</li> <li>• Establish fishing zones in EHLCR</li> <li>• Demarcate the MPA boundaries</li> <li>• Educate public of boundaries and the MPAs</li> <li>• Assess the effectiveness of East Harbour Lobster and Conch Reserve (EHLCR) as a tool for fisheries management</li> <li>• Identify new areas for protection</li> </ul>	<p>Log a minimum of 50 patrols/year in the protected areas managed by the Fisheries Sub-department.</p> <p>Complete reconnaissance and all other research in protected areas by August 2005.</p> <p>Develop action/ management plan for all protected area systems managed by the Fisheries Sub-department.</p> <p>Complete research and present findings to the Government by August 2005</p>	<p>Increase in funds for fuels</p> <p>Collaboration with Protected Areas Department.</p> <p>Funds for equipment and research.</p> <p>Collaboration with SFS on research</p>
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<p>Habitat degradation and destruction</p>	<ul style="list-style-type: none"> <li>Control and monitor land-based pollution and coastal development particularly near critical coastal habitats for juveniles, i.e, mangrove wet-lands, sea grass beds and coral rubble fields</li> </ul>	<ul style="list-style-type: none"> <li>Protect critical habitats within protected areas systems.</li> <li>Make EIAs mandatory for any likely development activities in critical fishery habitats.</li> <li>Encourage Inter-ministerial and Departmental cooperation</li> </ul>	<ul style="list-style-type: none"> <li>Collaborate with Planning Department to implement policies by 2005 to seriously address development which may potentially impact on coastal communities.</li> </ul>	<p>Ministerial commitment, support of the planning department</p>
<p>Lack of knowledge on lobster recruitment rates to the Turks and Caicos Islands.</p>	<ul style="list-style-type: none"> <li>Conduct larval studies using larval collectors.</li> </ul>	<ul style="list-style-type: none"> <li>Promote larval research by NGOs in collaboration with the Government.</li> </ul>	<ul style="list-style-type: none"> <li>Preliminary recruitment index for the TCI by August 2005</li> </ul>	<p>Collaboration with NGOs conducting research</p>
	<ul style="list-style-type: none"> <li>Using “mini-casitas” (artificial habitats) investigate potential recruitment rates into the TCI.</li> </ul>	<ul style="list-style-type: none"> <li>Deploy mini-casitas and monitor over 5-year period to assess rate and level of settlement as a source of potential recruitment into the fishery.</li> </ul>	<ul style="list-style-type: none"> <li>Complete research and present preliminary findings by August of 2006.</li> </ul>	<p>Funds for research and equipment. Collaboration with SFS. Technical staff strengthening.</p>
	<ul style="list-style-type: none"> <li>Sample lobsters landed at the processing plants to determine age and rate of recruitment into the fishery.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct morphometric study of lobsters landed at the processing plants.</li> </ul>	<ul style="list-style-type: none"> <li>Annual catch analysis review</li> </ul>	<p>Technical staff Training of Conservation Officers</p>



<ul style="list-style-type: none"> <li>• Lack of scientific research based information for decision making.</li> </ul>	<ul style="list-style-type: none"> <li>• Institutional strengthening.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase the number of technical staff of the D.E.C.R.</li> <li>• Implement an internship system to assist in the implementation of the scientific program.</li> <li>• Develop research priority areas and encourage international researchers &amp; institutions to conduct research which are beneficial to the TCI</li> </ul>	<p>Strengthen the scientific research capabilities of the Department by 2005.</p>	<p>Funds for new staff members, upgrading of Fisheries Office and Laboratory area, collaboration with universities in the region and internationally to attract interns and research students.</p>
<p>Fishermen are experiencing low income level as profits are dissipated among resource users.</p>	<p>Stabalise and improve on fishers incomes from the fishery.</p>	<ul style="list-style-type: none"> <li>• Collect data on cost and earnings.</li> <li>• Implement management strategy.</li> <li>• Develop niche markets locally and internationally to utilise extracted lobster head meat.</li> <li>• Investigate the potential for value added products.</li> </ul>	<p>Increase fisher's net income by at least 15% by 2007.</p>	<p>Minister to publicly promote, collaboration among/with restaurant and hotel managers, processing plant managers.</p> <p>D.E.C.R. to investigate potential for value added products, and processing plants that can undertake such product development.</p>



<p>Lack of an available market for fishermen to land their products on islands without fish processing facilities.</p>	<ul style="list-style-type: none"> <li>Promote the development of fishermen's cooperative on islands without plants</li> </ul>	<ul style="list-style-type: none"> <li>Conduct more socio-economic research</li> <li>Promote the formation of fishermen cooperatives</li> <li>Organize fishermen</li> <li>Develop processing plant infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>By 2007, all the islands without a processing plant would have a Class B facility.</li> </ul>	<ul style="list-style-type: none"> <li>Funds for market research.</li> <li>Ministerial commitment to develop processing facilities and issue Class B licenses</li> </ul>
<p>Increase in sport fishers harvesting lobsters and illegally selling to restaurants</p>	<ul style="list-style-type: none"> <li>Implement strategy to discourage sport fishers from participating in lobster fishery</li> </ul>	<ul style="list-style-type: none"> <li>Restrict sport fishing category to using line only to fish (no diving)</li> <li>Amend regulations to reflect the gear restriction for sport fishers.</li> </ul>	<p>By August 2005, it would be illegal for sport fishers to dive for lobster.</p>	<p>EXCO commitment to amend regulations</p> <p>AG chambers to draft amendments in legislations</p> <p>DECR to enforce new regulations</p>
<p>Delimitation of boundaries between TCI and the Dominican Republic.</p>	<p>TCI Government, FCO and Governor's Office to negotiate with the Government of the Dominican Republic to finalize discussions about the delimitation of boundaries</p>	<p>TCI Government to inform Governor of issues</p> <p>Governor and FCO and TCI Government to convene meeting with Government of the D.R.</p> <p>Government to finalize negotiations about boundaries and sign treaty.</p>		<p>Chief Minister to take up the matter to Governor and FCO</p> <p>AG Chambers to advise the Government</p> <p>Commitment of FCO</p> <p>Cooperation of the Government of the Dominican Republic.</p>



<p>Lack of enforcement of regulations. Enforcement (Officers are reluctant to charge their friends and relatives because of fear that the courts will impose a heavy penalty on the accused.)</p>	<ul style="list-style-type: none"> <li>Evaluate alternative enforcement strategies.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake study on community reluctance to enforce regulations</li> <li>Develop and implement appropriate enforcement strategies.</li> <li>Consider establishing a ticketing system for enforcement (3 strikes you're out)</li> </ul>	<ul style="list-style-type: none"> <li>Amendments of the legislations by August 2006</li> </ul>	<p>Ministerial commitment to amend existing regulations</p> <p>AG to draft amendments to legislations</p>
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# Management Plan for QUEEN CONCH



<p><b>Target Fishes</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Queen Conch (<i>Strombus gigas</i>)</li> </ul>
<p><b>Life History</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <i>Distribution</i> - Larvae are planktonic for about three (3) weeks. Juveniles inhabit shallow coastal habitats such as seagrass, and sandy bottoms in protected bays where they remain buried in the substrate. Adults prefer similar habitats in deeper water.</li> <li><input type="checkbox"/> <i>Growth</i> - Shell length stops increasing at the onset of sexual maturation, typically at an age of about 3-3.5 years. At this time, the shell develops a characteristic flared lip. Shell weight and flesh weight continue to increase after lip formation. Lip thickness increases with age.</li> <li><input type="checkbox"/> <i>Mortality</i> - Maximum life span is thirty (30) plus years.</li> <li><input type="checkbox"/> <i>Spawning</i> – It is thought that they are likely to mate and spawn throughout the year, but in the TCI reproduction probably peaks between April and July. Females may copulate with several males and store the sperm for several weeks prior to spawning.</li> </ul>
<p><b>Fishing Methods</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> The conch fishery provides a supplementary income for fishermen during the lobster closed season. Conchs are gathered by hand after being sighted from the surface. The animals are removed from the shell at sea. Some conch fishermen fish single handed, but it is most common for each vessel to carry two or three crew members. In three man crews, a dedicated driver is usually responsible for removing the conch from the shell.</li> <li><input type="checkbox"/> The Caicos Conch farm is a mariculture/aquaculture facility which uses veligers from egg masses to grow into adult conch.</li> </ul>
<p><b>Management Unit</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Turks and Caicos banks for juvenile and adults. Wider Caribbean for planktonic larvae.</li> </ul>
<p><b>Resource Status</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Although intensively fished and possibly over-fished in certain areas (Ninnes, 1994; Fenton et al., 1997), the Queen Conch populations of the Turks and Caicos Islands are generally considered to be stable. It is assumed that unexploited ‘deep-water’ stocks exist that contribute significantly to recruitment of the fished stocks in shallower waters (Ninnes and Medley, 1995). The overall fishing effort under the current national annual export quota of 600,000 lbs. (272,160 kg) is considered to be maintaining the stock size at suitable levels (Anon., 1999). Studies on protected versus fished populations found differences in densities as well as age structure, with juveniles being significantly denser in fished areas than adults (Tewfik and Béné, 1998). For example, total densities in algal plain in fished areas were 687.2 conchs/ha versus densities of 2162 conchs/ha in protected areas. The overall mean density for both protected (EHLCR) and fished areas (Caicos and Turks Banks) was reported to be the highest in the region at 426.53 conchs/ha.</li> </ul>
<p><b>Catch History</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> The Turks and Caicos Islands have one of the longest catch-effort time series datasets. Data on commercial harvesting dates back to 1887, however data on effort are only available from 1977. The Queen Conch fisheries in the TCI is characterised by fluctuation in landing reaching a peak of approximately 5,773,906 lbs. (2619 MT) in 1943 followed by a gradual decline to an all time low of 36,155 lbs.</li> </ul>



	<p>(16.4 MT) in 1969. The fishery rebounded to a maximum catch level of 2, 535,316 lbs. (1150 MT) in 1980 and senesced at the current TAC level of 1,657,876 lbs. (752 MT). The observed fluctuation is presumed to be the resultant of over-fishing (Nines, 1994) and independent factors such as climate, past World Wars and a shift to more lucrative employment opportunities, for example to the lobster and or the tourism industry (Medley &amp; Ninnes, 1999; Bene &amp; Tewfik, 2001 and Clerveaux &amp; Vaughan 2001).</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Economically the Queen Conch fishery is the second most valuable fishery in the TCI being surpassed in value only by the spiny lobster (<i>Panulirus argus</i>) fishery. The fishery is calculated at an ex-vessel value of approximately USD 1,273,499 in 2002. Appledoorn (1997) reported that the value of the fishery is multiplied several fold due to job creation and marketing of conch meat, particularly through the tourist and restaurant trade.</li> <li><input type="checkbox"/> The Turks and Caicos Island exports approximately 659,050 lbs of wild harvested conch meat, 138, 250 lbs of conch trimmings, 6,730 lbs. of mariculture conch meat, 1,770 mariculture live conch, 6,034 lbs of conch shell and shell derivatives.</li> </ul>
<p style="text-align: center;"><b>Current Regulations</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Listed on Appendix II of CITES and in the IUCN Red Data book as “commercially threatened”</li> <li><input type="checkbox"/> Size restrictions: minimum shell length of 7 inches and/or meat weight of 8 ounces</li> <li><input type="checkbox"/> Policy restricting harvesting and export based on a quota (TAC) system</li> <li><input type="checkbox"/> Closed season from July 15<sup>th</sup> to October 15<sup>th</sup></li> </ul>
<p style="text-align: center;"><b>Management Objectives</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> To ensure that the catch does not exceed sustainable levels, or a predetermined reference point (e.g. MSY).</li> <li><input type="checkbox"/> To maintaining effort levels in the queen conch fishery at or below the corresponding level required to obtain the target reference point.</li> <li><input type="checkbox"/> To explore options of optimising economic earnings, including foreign exchange, from the queen conch fishery given the biological and economic objectives listed above.</li> <li><input type="checkbox"/> To explore the feasibility of expanding markets for derivatives of conch (shells, trimmings, ornaments)</li> <li><input type="checkbox"/> To promote national and international collaboration in research and management in order to improve the effectiveness in managing the conch fishery of the Turks and Caicos Islands.</li> </ul>



**Management Strategy**

- Enforce existing regulations.
- Establish reference points for management, e.g. Target Reference Point (TRP) and Limit Reference Point (LRP).
- Restrict part-time and foreign fishers from commercially participating in the queen conch fishery.
- Develop local niche market for conch derivatives in order to reduce processing waste and supplement resource users' net income.
- Modify the regulation of minimum size from shell length to shell lip thickness, which would prove a better indicator of size at sexual maturity.
- Investigate the phenomenon of "stunting" in queen conchs found on the Caicos bank. Investigate the causes, distribution and volume of this occurrence.
- Enter into bilateral and or multilateral agreements with neighbouring countries such as the Bahamas, Dominican Republic, and Cuba to improve on management, enforcement and research.
- Enter into regional fishing agreement, involving the FAO-WECAF and/or CRFM, to foster sustainable regional management of the lobster stocks.

# Action Plan for QUEEN CONCH



Issues	Action	Implementation Strategy	Performance indicators	Resources Required
<p>Maintaining current levels of exploitation while minimising the risk of overfishing (surpassing the calculated MSY).</p>	<ul style="list-style-type: none"> <li>Continue using a harvesting quota to protect the stocks from over-exploitation.</li> </ul>	<ul style="list-style-type: none"> <li>Continue using the modified Schaefer Model to calculate the TAC (quota).</li> </ul>	<p>The TAC will be calculated annually based on previous years catch.</p>	<p>Computer to store database.</p>
	<ul style="list-style-type: none"> <li>Implement a buffer between the actual harvested limit and the calculated MSY level.</li> </ul>	<ul style="list-style-type: none"> <li>Establish target and limit reference points</li> <li>Develop and implement management strategy based on reference points approach.</li> </ul>	<p>Implement management strategy by October 2004.</p>	<p>Computer to house database, collaboration with CITES Scientific Authority members to review results.</p> <p>D.E.C.R. and FAC to inform and educate resource users</p>
<p>Doubts on reliability of the Schaefer Model to forecast catch for TCI conch Fishery.</p>	<ul style="list-style-type: none"> <li>Independently estimate biomass and potential yield to compare with the results of the Schaefer Model.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct periodic visual survey of the Turks and Caicos Banks to cross-check results obtained from the model.</li> </ul>	<p>Complete research by August 2006.</p>	<p>Funds for research, institutional strengthening.</p>



Habitat degradation and destruction	<ul style="list-style-type: none"> <li>Control and monitor land-based pollution and coastal development particularly near critical coastal habitats for juveniles, i.e, mangrove wet-lands, sea grass beds and coral rubble fields.</li> </ul>	<ul style="list-style-type: none"> <li>Protect critical habitats within protected areas systems.</li> <li>Make EIAs mandatory for any potential development activities in critical fishery habitats.</li> <li>Encourage Inter-ministerial and Departmental cooperation</li> </ul>		<p>Ministerial commitment, planning department</p> <p>Revision of EIA process by planning and AG</p>
	<ul style="list-style-type: none"> <li>Evaluate and explore the use of marine protected areas as a tool for fisheries management in the TCI</li> </ul>	<ul style="list-style-type: none"> <li>Assess the effectiveness of East Harbour Lobster and Conch Reserve (EHLCR) as a tool for fisheries management</li> <li>Identify new areas for protection</li> </ul>	Complete research and present findings to the Government by October 2005	<p>Funds for equipment and research.</p> <p>Collaboration with SFS on research</p>
Unknown extent of conch habitat	<ul style="list-style-type: none"> <li>Initiate efforts to map the critical habitat of conch to refine estimates of potential yield.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake project to identify and map conch habitats.</li> </ul>	Complete project with GIS maps available by 2007	<p>Funds and skills.</p> <p>Support habitat mapping studies.</p>
Depletion of conch stocks in some areas	<p>Explore (encourage) expanding Marine Protected Areas</p> <p>Seed fishing grounds with juvenile conch.</p>	<ul style="list-style-type: none"> <li>Determine and declare MPAs and FPAs in selected locations</li> <li>Monitor, design action plan for MPAs and FPAs</li> <li>Assess the effectiveness of EHLCR as a fisheries tool.</li> <li>Investigate feasibility of replenishing stocks with conch seeds from the Caicos Conch Farm</li> </ul>	Complete research by August 2006	<p>Funds for research</p> <p>Collaboration with SFS and Caicos Conch Farm.</p>



<p>Poaching by foreign nationals</p>	<ul style="list-style-type: none"> <li>Discourage foreign nationals from illegally fishing on the Turks and Caicos Banks.</li> </ul>	<ul style="list-style-type: none"> <li>Increase joint enforcement with Marine Police</li> <li>Increase Sea patrols venturing further out to EEZ limits.</li> <li>Promote intelligence based enforcement</li> <li>Facilitate bilateral and regional agreements with countries that the poachers come from.</li> </ul>	<p>Numbers of foreign fishers fishing far into the Caicos Bank significantly reduced by 2006. Most vessels apprehended by the time they get on the Mouchoir Bank.</p>	<p>Funds for fuel, Governor and Ministerial commitment to facilitate bilateral agreement, collaboration of foreign decision makers, AG to revise agreement</p>
<p>Unknown local consumption level which may cause an underestimation of total catch (catch destined for export + local consumption catch)</p>	<ul style="list-style-type: none"> <li>Determine a local consumption index.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct a national survey throughout the Turks and Caicos to estimate local consumption.</li> <li>Implement a monitoring program to collect local consumption data from all establishments that purchase or offer marine products for sale.</li> </ul>	<p>Local consumption index calculated and implanted in Schaefer Model by August 2005.</p>	<p>Collaboration of SFS, local population and restaurants to answer questions.</p>
<p>Uncertainty if there exists a deep-water stock which may be acting as a reservoir for conch on the Turks and Caicos Banks.</p>	<ul style="list-style-type: none"> <li>Locate deep water stock.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct visual survey to locate deep-water stocks.</li> <li>Investigate the feasibility of implementing legislation to protect these stocks.</li> </ul>	<p>Complete research by 2007.</p>	<p>Funds for research, increase in technical staff, SCUBA gear and equipment.</p>



<p>Fishermen are experiencing low income level as profits are dissipated among resource users.</p>	<ul style="list-style-type: none"> <li>• Stabalise and improve on fishers and other participants incomes from the fishery.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct bio-economic study of queen conch fishery</li> <li>• Conduct cost and earnings studies for the fishing operations in the queen conch fishery.</li> <li>• Reduce effort in the fishery (part-time &amp; foreign fishers)</li> <li>• Develop niche market for derivatives from processing waste.</li> <li>• Develop value added products.</li> </ul>	<p>Increase fisher's net income by at least 15% by 2008.</p>	<p>Minister to publicly promote, collaboration of restaurant, hotel and processing plant managers. D.E.C.R. to investigate potential for value added products, &amp; I.D plants that can undertake development.</p>
<p>Morphometric variation of queen conch on the Turks and Caicos Banks (e.g. stunted conchs at French Cay and West Caicos).</p>	<ul style="list-style-type: none"> <li>• Conduct research to determine extent and distribution of stunted conchs on the Banks.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct survey of Caicos and Turk Bank</li> <li>• Collect conchs from different regions of the banks and measure morphometric parameters.</li> </ul>	<p>Research complete by August 2006</p>	<p>Funds for research, institutional strengthening</p>
	<ul style="list-style-type: none"> <li>• Determine the factors, which cause stunting in queen conch, and explore the possibility of alleviating this phenomenon.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct research and examine the influence of habitat type, stocking density, and physical environmental parameters.</li> </ul>	<p>Research Commence by August 2006.</p>	<p>Funds for research, institutional strengthening.</p>



# Conservation Plan for TURTLES

<p><b>Target Species</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Green Turtle (<i>Chelonia mydas</i>)</li> <li><input type="checkbox"/> Loggerhead (<i>Carretta carretta</i>)</li> <li><input type="checkbox"/> Hawksbill (<i>Eretmochelys imbricata</i>)</li> </ul>
<p><b>Life History</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Males and females mate offshore in waters near the nesting beaches. The female comes ashore and deposits 80- 200 eggs in holes that they excavate using their flippers and compact the sand after using their body weight.</li> <li><input type="checkbox"/> The nest is normally found in the upper region of the beach, close to dunes or vegetation.</li> <li><input type="checkbox"/> The eggs incubate for approximately two months in the sand and the hatchlings normally come out at night where they migrate directly to the sea.</li> <li><input type="checkbox"/> Once in the sea the turtles will inhabit the Atlantic and the Gulf of Mexico where they will remain for several years and females will return to the original beach where they were hatched to lay their eggs.</li> </ul>
<p><b>Fishing Methods</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Most fishermen free dive and use either their hands or Hawaiian sling to capture marine turtles.</li> </ul>
<p><b>Management Unit</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> The Caicos bank for mature reproducing adults, nesting beaches for adults and eggs.</li> <li><input type="checkbox"/> Wider Caribbean for migratory path.</li> </ul>
<p><b>Resource Status</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> No stock assessment has been done for marine turtles in the TCI, but turtle species are considered to be endangered, risk of going extinct and are therefore protected internationally.</li> </ul>
<p><b>Catch History</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Historically, turtle was a coveted dish, and as such were highly exploited. However, with high imports of meat from the U.S. the demand for turtle meat is less. Catching of turtle is more or less opportunistic. A small number of fishermen target turtles only when there is a specific order by a restaurant or an individual.</li> </ul>
<p><b>Current Regulations</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Minimum size limits of 20 inches, measured from the dorsal exoskeleton.</li> <li><input type="checkbox"/> Capture of any turtle on the beach or possession of turtle eggs are prohibited</li> </ul>
<p><b>Management Objectives</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Conservation and sustainable subsistence fishing of marine turtles</li> </ul>
<p><b>Management Strategy</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Enforcement of existing regulations.</li> <li><input type="checkbox"/> Establishment of a maximum legal size for any turtle's species allowed to be harvested so as to protect large breeders</li> <li><input type="checkbox"/> Protection of critical habitats</li> <li><input type="checkbox"/> Prohibition of the Capture of Hawksbill turtle</li> <li><input type="checkbox"/> Closed season 1 April- 31 July</li> <li><input type="checkbox"/> Conduct scientific research in collaboration with regional and international initiatives to confer some protection of the stocks</li> </ul>



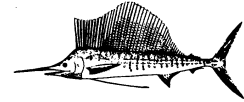
# Action Plan for TURTLES

Issues	Action	Implementation Strategy	Performance Indicator	Resources Required
<p>Lack of scientific information on the biology, stock status in TCI waters, reproducing beaches, international/ regional migratory pathways.</p>	<p>Promote scientific research of marine turtles in the Turks and Caicos Islands.</p>	<p>Continue to promote and participate in national, regional and international research.</p> <p>Develop beach monitoring programme for turtles.</p> <p>Continue to participate with regional and international organisations on genetic study which may indicate countries with which the Turtles of the Turks and Caicos Islands are sharing the resources.</p> <p>Promote tagging studies in the Turks and Caicos Islands.</p> <p>Promote research that would enable assessment of the TCI marine turtle population.</p>	<p>Significant improvement in scientific knowledge of the turtle population in the TCI by 2007.</p>	<p>Ministerial approval of scientific research permits for foreign researchers.</p>
<p>Lack of public education and sensitisation on the protection of marine turtles</p>	<p>Promote Ministerial, Governmental and public education on the extinction threat which marine turtles face.</p>	<p>Develop and implement public education strategy to inform the general public, the Government and investors of the threat which turtles face.</p> <p>Continue to collaborate with National Trust in providing environmental education to local schools.</p>	<p>Improved awareness by Ministers, senior public servants and the public</p>	<p>FAC, National Trust, SFS and D.E.C.R. to collaborate to increase environmental education efforts.</p> <p>Funds for environmental education.</p>



<p>Lack of adequate protection</p>	<p>Implement legislations to confer additional protection of the marine turtles of the Turks and Caicos Islands</p>	<p>Promote well regulated/controlled development along beaches which are identified as important nesting beaches.</p> <p>Implement special protocol for development along nesting beaches, eg. boardwalks, dim lighting, noise reduction etc.</p> <p>Develop legislation and implement a closed season for marine turtles.</p> <p>Consider complete banning of harvesting of hawksbill turtle which is currently critically endangered.</p> <p>Establish <b>Maximum</b> legal size limit which is allowed for harvesting in order to protect the large breeders.</p> <p>Protect isolated cays which are important nesting beaches for turtles (e.g. Fish Cay) as Sanctuaries.</p> <p>Evaluate the need to include marine turtles of the Turks and Caicos Islands into the "red list" for protection by the Endangered Species Act which is currently being drafted.</p>		<p>Ministerial commitment, planning department, and collaboration of developers. AG chambers to develop legislations.</p> <p>D.E.C.R. and FAC to educate and keep the public informed of management plans.</p>
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# Management Plan for Fin-fish Fisheries



<b>Target Fisheries</b>	<b>Commercially Exploited Fin-fish Fishery</b>	Grouper (Serranidae) Triggerfish (Balistidae) Jacks (Carangidae) Mackerel (Scombridae)	Grunt (Haemulidae) Snapper (Lutjanidae) Hogfish (Labridae)
	<b>Underexploited Fin-fish Fishery</b>	Parrotfish (Scaridae) Porgy (Sparidae) Boxfish (Ostraciiontidae) Red Snappers	Tunas ( <i>Scombroidei</i> ) Billfishes ( <i>Istiophoridae</i> ) Swordfish ( <i>Xiphius gladius</i> )
	<b>Subsistence Fin-fish Fishery</b>	Grunt (Haemulidae) Squirrelfish (Holocentridae)	
	<b>Under-Consumed Fin-fish Fishery</b>	Barracuda (Sphyraenidae) Sharks	
	<b>Non-extractive Fin-fish Fishery (Sport Fishing)</b>	Bonfish (Albulidae) Tunas ( <i>Scombroidei</i> ) Billfishes ( <i>Istiophoridae</i> ) Swordfish ( <i>Xiphius gladius</i> )	
<b>Life History</b>	<b>Shallow Reef Fishes</b> Grunt (Haemulidae) Squirrelfish (Holocentridae) Snapper (Lutjanidae) Triggerfish (Balistidae)	<input type="checkbox"/> <i>Distribution</i> - juveniles prefer shallow waters of seagrass beds; adults prefer coral reefs <input type="checkbox"/> <i>Growth</i> - up to 50 cm in length (many species); <input type="checkbox"/> <i>Mortality</i> – 4-6 years incorrect – some have life spans 15-20 years <input type="checkbox"/> <i>Spawning</i> – varies by species, but most broadcast eggs into the plankton	
	<b>Deep Slope Fishes e.g.</b> Groupers (Serranidae) Nassau Grouper, Yellow Fin Grouper and Black Fin Grouper Hogfish (Labridae)	<input type="checkbox"/> <i>Distribution</i> - juveniles prefer shallow waters; adults are more common in deep waters <input type="checkbox"/> <i>Growth</i> - greater than 100 cm in length (most species); slow-growing <input type="checkbox"/> <i>Mortality</i> - long-lived <input type="checkbox"/> <i>Spawning</i> - groupers form large spawning aggregations; several species are hermaphroditic; eggs presumed to be planktonic.	



	<p><b>Coastal Pelagics Fishes e.g</b>                  Jacks (Carangidae),                  Herrings (Clupeidae)                  Tunas (Scombroidei)</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <i>Distribution</i> – mainly fished within 2 km from shore</li> <li><input type="checkbox"/> <i>Growth</i> - little information available. Varies with species</li> <li><input type="checkbox"/> <i>Mortality</i> - little information available. Varies with species</li> <li><input type="checkbox"/> <i>Spawning</i> – Jacks spawn offshore throughout the year; all species have planktonic early life history stages.</li> </ul>
	<p><b>Large Pelagics Fishes</b>                  Billfishes (Istiophoridae)                  Swordfish (Xiphias gladius)</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <i>Distribution</i> – Most species are highly migratory. Stocks which are probably contained within the Caribbean Region are dolphinfish, kingfish, wahoo, blackfin tuna; Stocks which extend throughout the Atlantic or at least the western Atlantic are for example yellowfin tuna, skipjack tuna, billfishes, and swordfish. Determinants of localized distribution include temperature, bottom topography, salinity, planktonic abundance and currents.</li> <li><input type="checkbox"/> <i>Growth/Mortality</i> - Growth rate is highly variable among species. Tunas, sharks, billfishes can grow to several metres in length. Most species are relatively long-lived.</li> <li><input type="checkbox"/> <i>Spawning</i> - Reproductive behaviour is poorly known for most species.</li> </ul>
<b>Fishing Methods</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Shallow reef and deep slope species are taken primarily by spear fishing and to a lesser extent with traps as by-catch of spiny lobster fishing. However, there is a small number of commercial fishers that target these resources using hydraulic reels for bottom fishing off the periphery of the Caicos and Turks Banks. Coastal and large pelagic species on the other-hand are fished mainly using hand line.</li> </ul>	
<b>Management Unit</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Island shelf for juveniles and adults of shallow reef, deep slope and coastal pelagic species; Distribution may be wider for early life stages due to egg and larval drift in ocean and coastal currents.</li> <li><input type="checkbox"/> ICCAT uses the Western Atlantic or the entire Atlantic Ocean as the management unit for most tunas, billfish and swordfish, and these stocks are shared or straddling.</li> </ul>	
<b>Resource Status</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Underutilised, believed to be healthy. Ninnes reported in 1990 a potential yield of 70-140 kg/km off the shelf perimeter of the Turks and Caicos Islands (Caicos Bank, Turks Bank, and Mouchoir Bank).</li> </ul>	
<b>Catch History</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Unknown. Finfish are sold directly to hotels restaurants and fish markets, which cater for local consumption. However, some of the catch are sold to the Processing Plants and may be exported. The D.E.C.R. has not been successful in collecting catch and effort data.</li> </ul>	
<b>Current Regulations</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> There are currently no specific regulations with regard to fin-fish management.</li> <li><input type="checkbox"/> Regulation prohibiting processing of marine products while at sea.</li> <li><input type="checkbox"/> A licence is required for all vessels or persons engage in commercial fishing</li> <li><input type="checkbox"/> The legislation makes provisions for only locals, better known as ‘Belongers’ to fish commercially.</li> </ul>	



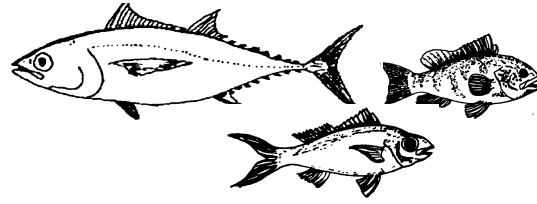
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Sport fishers are allowed a bag limit of 10 lbs. for personal consumption</li> <li><input type="checkbox"/> Regulation on minimum mesh size for fish or lobster pots.</li> <li><input type="checkbox"/> The legislation makes provision to reduce 'ghost fishing' by implementing a clause that all fish pots should be constructed of or contain a panel made of deteriorating materials, which would deteriorate after being continuously in the water for no more than six weeks. This legislation is aimed at protecting the shallow reef and deep slope species.</li> <li><input type="checkbox"/> Large Pelagic fall under ICCAT and CMS (bilateral treaties)</li> </ul>	
<b>Management Objectives</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Promote sustainable development of the fin-fish fisheries resources by adopting cautious conservation and management measures in conjunction with the 'Guidelines on the precautionary principle' (FAO <i>Technical guidelines for Responsible Fisheries</i>. No.2. Rome, FAO. 1996)</li> </ul>	
	<b>Commercially Exploited Fin-fish Fishery</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Maintain high stock levels</li> <li><input type="checkbox"/> Improve our understanding and knowledge of the stocks</li> <li><input type="checkbox"/> Develop management guidelines for the conservation and sustainable exploitation of the fishery</li> </ul>
	<b>Under-exploited Fin-fish Fishery</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Promote sustainable development/exploitation of these resources</li> <li><input type="checkbox"/> Determine the Maximum Sustainable Yield limit</li> <li><input type="checkbox"/> Establish reference points for the management of the resources</li> </ul>
	<b>Subsistence Fin-fish Fishery</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Promote sustainable development/exploitation of these resources</li> </ul>
	<b>Under-Consumed Fin-fish Fishery</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Promote sustainable development/exploitation of these resources</li> <li><input type="checkbox"/> Remove the taboo associated with the non-consumption of these resources by public education and promotion</li> </ul>
	<b>Non-extractive Fin-fish Fishery (Sport Fishing)</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue to promote the non-extractive utilisation of these resources</li> </ul>



**Management Strategy**

- ❑ Implement the United Nations precautionary principle for managing straddling fish stocks and highly migratory fish stocks.
- ❑ Establish target and limit reference points for the various fin-fish fisheries in keeping with the specific objectives for each fishery.
- ❑ Update the 1990 finfish stock assessment carried out by Medley and Ninnes, by conducting a rapid survey to determine current stock levels.
- ❑ Develop and implement monitoring strategy that would allow the D.E.C.R. to collect catch and effort data.
- ❑ Update relevant fisheries regulations.
- ❑ Develop and implement legislation/regulations to promote catch and release by sport fishers.
- ❑ Conduct biological research in order to develop regulations to use such management tools as minimum size, close seasons, and close areas to protect the stocks and spawning aggregations.
- ❑ Participate in regional and international fishing initiatives (e.g CRFM, ICCAT) to foster sustainable development of the coastal and large pelagics.

# Action Plan for Commercially Exploited Fin-fish Fishery



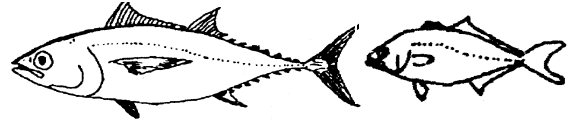
Issues	Action	Implementation Strategy	Performance Indicator	Resources Required
Illegal tampering with fish pots.	<input type="checkbox"/> Increase surveillance and enforcement efforts by enforcement agencies.	Increase number of surveillance exercises by D.E.C.R. and TCI Marine Police.	Increase surveillance effort by 20 % by August 2005	Funds for fuel.
Inadequate catch, effort, biological, economic and social (consumption) data on the fishery	<input type="checkbox"/> Integrate and improve collection of biological, catch, effort, social and economic data.	Implement data collection at processing plants, Class B plant licence owner, restaurants, and all fish vending facilities.  Support biological, economic and social data collection efforts.	D.E.C.R. to have an updated database on catch, effort, biological, social and economic data by August 2005	Collaboration of resource users; computer to house database
Lack of current information on the status of the stocks.	<input type="checkbox"/> Determine current status of stocks.	Conduct rapid assessment of the stocks, and cross-check results with most recent comprehensive stock assessments conducted in 1990.  Develop and implement management strategy using reference points approach.	Commence research by 2005/06  Management measures being implemented in 2006	Funds for research, institutional strengthening.
	<input type="checkbox"/> Determine local consumption levels of fin-fish.	Develop and implement monitoring strategy to collect consumption data from all establishments in TCI which sells marine products e.g. restaurants, hotels, supermarkets. Fish-markets etc.	Develop consumption index by 2005	Collaboration of local public restaurant, hotel managers and SFS.



	<ul style="list-style-type: none"> <li>□ Determine economic value of the resources.</li> </ul>	Update the catch, effort economic and marketing information from the industry to assess the economic value of the resources.	Complete socio-economic survey by 2007	Collaborate with CERMES, SFS, and other universities for interns.
Illegal Foreign Fishing	<ul style="list-style-type: none"> <li>□ Increase surveillance and enforcement efforts by enforcement agencies.</li> </ul>	Increase number of surveillance exercises by D.E.C.R. and TCI Marine Police.	Numbers of foreign fishers fishing far into the Caicos Bank significantly reduced by 2005. Most vessels would be apprehended by the time they get on the Mouchoir Bank	Funds for fuel, Governor and Ministerial commitment to facilitate bilateral agreement; collaboration of foreign decision makers; AG to revise agreement
Vulnerability of stocks	<ul style="list-style-type: none"> <li>□ Protect resources during spawning season e.g groupers and snappers</li> </ul>	Determine spawning season and locate aggregating sites for Groupers and Snappers.  Implement appropriate legislations to protect the aggregating sites during spawning period	Major spawning sites would be located and protected by 2007	Ministerial commitment, AG to develop legislations, funds for research
	<ul style="list-style-type: none"> <li>□ Protect juvenile stocks from being harvested before attain sexual maturity (growth overfishing).</li> </ul>	Revise the size at maturity limit obtained from the 1990 survey.  Implement minimum size limit legislations.	Complete by August 2006	Funds for research, ministerial commitment, and AG to develop legislations
Lack of legislations to adequately manage the fin-fish fishery.	Develop fin-fish legislations to protect the fishery.	Review fin-fish regulations and update based on fisheries advice from research as well as from experience of other countries, throughout the region, having similar fisheries.	Complete revision and submit proposed amendments to legislations/regulations by end of 2005/06.	Ministerial commitment  AG Chambers  Access to internet



# Action Plan for Underexploited Fin-fish Fishery



Issues	Action	Implementation Strategy	Performance Indicator	Resources Required
Lack of data collection system for catch, effort, biological, social and economic data.	Develop and implement data collection system for catch, effort, biological, social and economic data.	Implement data collection at processing plants, Class B plant licence owner, restaurants, and all fish vending facilities. Support biological, economic and social data collection efforts.	D.E.C.R. to have an updated database on catch, effort, biological, social and economic data by August 2005	Collaboration of resource users, computer to house database
Underutilisation of this resource	Encourage exploitation of reef fish and deep slope fishes.	<ul style="list-style-type: none"> <li>❑ Government should offer incentives such as confiscated vessels and gear to locals to encourage exploitation of the finfish resources.</li> <li>❑ Allow foreign fishers to assist/train locals in this fishery.</li> <li>❑ Provide fiscal and other incentives to fishers, etc.</li> <li>❑ Encourage loan agencies to invest in the development of this fishery by providing loans to fishers, etc.</li> </ul>	Increase in number of fishers changing over to this finfish fishery as a source of primary income as opposed to lobster or conch fishery by 2007.	Incentives by government; licensing of foreign fishers



<p>Vulnerability of Stocks to overexploitation.</p>	<p>Adopt precautionary principle</p>	<p>Establish provisional target and limit reference points for the fishery (e.g. catch limits, effort limits, and gear restrictions)</p> <p>Conduct research to determine status of the stocks.</p> <p>Develop management strategy based on reference point approach.</p>	<p>Complete and propose provisional reference points to Management by end of 2005</p> <p>Complete stock assessment and develop management strategy by end of 2007</p>	<p>Funding for research, Vessel and gear for research.</p> <p><b>This research is beyond the capacity of D.E.C.R.</b></p>
<p>Lack of legislations to adequately manage the fin-fish fishery.</p>	<p>Develop fin-fish legislations/ regulations to protect the fishery.</p>	<p>Review fin-fish regulations and update based on fisheries advice from research as well as from experience of other countries, throughout the region, having similar fisheries.</p>	<p>Complete and proposed amendments to legislations by end of 2005</p>	<p>Ministerial commitment, AG Chambers commitment to develop legislations</p>



# Action Plan for Subsistence Fin-fish Fishery



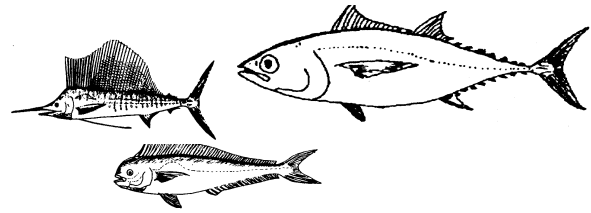
Issues	Action	Implementation Strategy	Performance Indicator	Resources Required
Habitat degradation and destruction	<input type="checkbox"/> Control land-based pollution and coastal development.	Encourage mandatory EIAs.	Implement policies in collaboration with planning to address this issues by 2005	Collaboration between planning department, PAD, DECR.
Insufficient data on fishing effort	<input type="checkbox"/> Improve the quality and scope of data collection.	Development monitoring techniques to collect data from fishers.	D.E.C.R. would have an updated database by 2005.	Computer to house database, collaboration of resource users tagging materials; logbooks
Lack of potential yield estimate	Support research aimed at assessing the productivity of nearshore habitats to allow for the estimation of the potential yield of reef fishes.	Support biological data collection programme	DECR would have an established monitoring and data collection programme by 2006.	Data Manager/- Supervisor/ Analyst.
Lack of fishing zones within protected areas system.	Establish fishing zones in the Protected Areas System.	Demarcate and implement fishing zones within the Protected Areas Systems.	Demarcation of fishing zones in protected areas complete by end of 2005	Collaboration of PAD, and resource users.
Loss of cultural heritage of subsistence fishing	Promote subsistence fishing as a cultural past-time	Educate and inform the general public.  Promote subsistence fishing by developing activities around it, e.g. local subsistence fishing tournaments.	Increase in the number of locals engage in subsistence/ sport fishing	Collaboration of PAD, community members and resource users.

# Action Plan for “Under-Consumed” Fin-fish Fishery



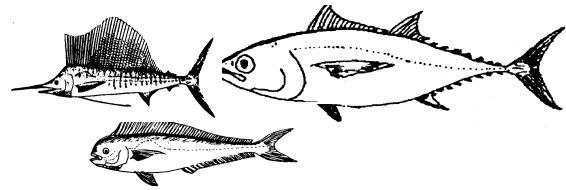
Issues	Action	Implementation Strategy	Performance Indicator	Resources Required
Social stigma exist which prevents effective exploitation. (E.g. not many locals consume barracuda because of fear of poisons or parrot fish because it is believed that parrot fish eat dirt) of some fish species.	Discourage social stigma and promote sustainable exploitation of these resources	<p>Educate the public of the nutritional value of the resources.</p> <p>Promote the development of a market for these resources</p> <p>Educate and encourage fishers to exploit these resources</p>	Increase in the consumption of these species	DECR, PAD, Broadcasting networks (Radio and TV Stations)
Fear and mis-understanding promotes wasteful exploitation. (e.g. Sharks are fished and killed because fishermen are afraid of sharks)	Promote sustainable exploitation while discouraging wasteful fishing practices.	Educate the fishers and the general public to discourage wasteful fishing.	Reduction in wasteful exploitation of resources, but instead an increase in the consumption of these species	DECR, PAD, Broadcasting networks (Radio and TV Stations)
Lack of potential yield estimate	<input type="checkbox"/> Support research aimed at assessing the productivity of nearshore habitats to allow for the estimation of the potential yield of these Under-Consumed fisheries.	Support and develop, where feasible, biological data collection programmes.	DECR would have an established monitoring and data collection programme by 2008	Data Manager/- Supervisor/ Analyst.
Lack of a regional management plan	<input type="checkbox"/> Continue to participate in ICCAT through UK and consider adopting national conservation measures.	<p>Discuss management options with the FAC.</p> <p>Implement FAO Plan of Action for management of Sharks or other species</p>		UK support.

# Management Plan for Non-Extractive Fishery (SPORT FISHING)



<p><b>Target Fishes</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Billfishes (<i>Istiophoridae</i>)</li> <li>Tunas (<i>Scombroidei</i>)</li> <li>Mackerel (<i>Scrombidae</i>)</li> <li>Bonefish (<i>Albulidae</i>)</li> <li>Jacks (<i>Carangidae</i>)</li> </ul>
<p><b>Fishing Methods</b></p>	<p>Cast fishing using hand line and fishing rods.</p>
<p><b>Management Unit</b></p>	<p>Shallow mudflats for bonefish Open coastal water for others</p>
<p><b>Resource Status</b></p>	<p>Resource believed to be healthy.</p>
<p><b>Catch History</b></p>	<p>Catch and effort information are discontinuous and patchy at best. However, the D.E.C.R. has started to collect catch data from sport fishing tournaments</p>
<p><b>Current Regulations</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> There are currently no specific regulations with regard to fin-fish management.</li> <li><input type="checkbox"/> A licence is required for all vessels or persons engage in sport fishing</li> <li><input type="checkbox"/> Sport fishers are allowed a bag limit of 10 lbs. for personal consumption.</li> <li><input type="checkbox"/> Regulation make provision for the holding of sport-fishing tournament</li> <li><input type="checkbox"/> Large pelagics such as tunas protected under ICCAT (bilateral treaties) management control.</li> </ul>
<p><b>Management Objectives</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Encourage further development of the sport fishing industry without negatively affecting the livelihood of local communities and their access to fish resources.</li> <li><input type="checkbox"/> Allow rational use of resources shared by sport fishing fishery and commercial fishery (e.g. bonefish)</li> </ul>
<p><b>Management Strategy</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Encourage commercial fishers to diversify into sport fishery as a means to supplement their net economic income.</li> <li><input type="checkbox"/> Promote the Turks and Caicos Islands, in particularly the less developed islands, as a sport fishing destination, to attract a different type of tourism clientele.</li> <li><input type="checkbox"/> Promote and encourage international sport-fishing tournament to provide exposure to the islands.</li> <li><input type="checkbox"/> Promote catch and release sport fishing, particularly during sport fishing tournaments</li> </ul>

# Action Plan for Non-Extractive Fisheries (SPORT FISHING)



Issues	Action	Implementation Strategy	Performance Indicator	Resources Required
<p>Underdevelopment of this sector of the fishery</p>	<p>Promote and encourage further development of this sector as part of the tourism marketing strategy for the Turks and Caicos Islands, particularly in the lesser developed islands.</p> <p>Provide opportunities and encourage local commercial fishermen to diversify into the sport fishing sector as a mean of diversifying their net income and embracing the opportunity to develop a sport fishing enterprise.</p>	<ul style="list-style-type: none"> <li>□ TCI Government to promote the Turks and Caicos as a sport-fishing destination</li> <li>□ Promote and encourage national and internationally acclaimed fishing tournaments (particularly in the lesser developed islands).</li> <li>□ Encourage investment in this sector of tourism</li> <li>□ Provide incentives to encourage local commercial fishermen to diversify into this sector e.g. TCI Invest could provide small business loans, low interest rate loans business management training.</li> </ul>	<p>Increase in number of sport fishing tourist enthusiasts visiting less developed islands in order to sport fish</p> <p>Increase in the number of commercial fishers switching from commercial fishing to sport fishing as a source of income</p>	<p>Ministerial commitment; international marketing of TCI as a sport fishing destination by TCI Gov and tourism board; collaboration with charter companies and commercial fishers.</p>
<p>Sports fishers are commercially selling catch to local restaurants and exporting to the U.S.</p>	<p>Develop enforcement strategies to discourage this practice</p>	<p>Amend the legislation/regulations to allow for only <b>catch and release</b> sport fishing.</p> <p>Increase enforcement efforts to discourage sport fishers from selling catch to local restaurants</p>	<p>Legislation amend and implemented by August 2006</p>	<p>Collaboration with AG Chambers, Ministerial Commitment</p>



<p>Net fishing for bonefish is a potential problem for the sport fishery of bonefish</p>	<p>Take remedial steps to gradually 'fade-out' nets in the bonefish fishery</p>	<p>Establish legislation/regulations prohibiting the use of nets to harvest bonefish</p> <p>Allow only a few individuals with special licence to fish using nets (only individuals who have used nets to fish in the past would be considered for this licence)</p>	<p>Legislation amend and implemented by August 2006</p>	<p>Collaboration with AG Chambers, Ministerial Commitment</p>
<p>Lack of legislation/regulations to effectively manage the sport fishery</p>	<p>Implement legislation/regulations to govern the use and exploitation of the resources.</p>	<p>Review regional sport fishing legislation and consider implementing similar legislation/regulations, where appropriate, in the Turks and Caicos Islands.</p> <p>Develop legislation and implement taking into consideration the importance of the tourism industry with regard to this fishery.</p>	<p>Legislation amended and implemented by August 2006</p>	<p>Collaboration with AG Chambers, Ministerial Commitment</p>
<p>Lack of catch and effort data, and monitoring of the sport fishery sector, which would provide the basis for stock assessment</p>	<p>Improve the quality and scope of data collection.</p>	<p>Continue to collaborate with fishers (sport fishing charter companies) to gather catch and effort data.</p> <p>Ensure that all sport fishing charter licensed operators are providing the D.E.C.R. with catch and effort data.</p> <p>Develop catch and effort forms and distribute to all licensed sport fishing charter operators, and to all sport fishing tournaments.</p>	<p>D.E.C.R. would have an updated database by 2005</p>	<p>Computer to house database, collaboration of resource users tagging materials; logbooks SFS</p>



# Management Plan for Mariculture/ Aquaculture in TCI

<p><b>Production History</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> The Caicos Conch Farm is the only economically profitable establishment in the world that produces juveniles farmed Queen Conch for sushi food markets in the USA and for the aquarium trade. Since the mid 1990's, export of mariculture/aquaculture conch meat has remained steady at approximately 60000 lbs (See Figure 2).</li> <li><input type="checkbox"/> Peace Corp workers seconded by the Smithsonian Institute initiated the Spider Crab Farm beginning in Grand Turk, then onto South Caicos and eventually settling in North Caicos. They commercially grew crabs, but the farm did not succeed because they cultured crabs that were not established on menus. They eventually shifted and started growing soft-shell crabs because of a growth cycle of 4 months.</li> <li><input type="checkbox"/> Sponge farming was tried off Silly Creek in the 40's. But, due to lack of funds and disease, this industry ultimately collapsed (see Sadler's).</li> </ul> <p>N.B. There are growing markets for sponges, to wash horses.</p>
<p><b>Current Regulations</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Currently there is no legislation which regulates or guides aquaculture/mariculture activities in the Turks and Caicos Islands.</li> <li><input type="checkbox"/> The development agreement between the conch farm and the TCI Government.</li> <li><input type="checkbox"/> Absence of guidelines or policies.</li> </ul>
<p><b>Management Objectives</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Promote the sustainable development of a mariculture/aquaculture sector in the Turks and Caicos Islands, as a means to reduce pressure and effort on the wild population of marine fisheries,</li> <li><input type="checkbox"/> Promote mariculture/aquaculture as a means of diversification in the fisheries sector to increase jobs and increase revenue.</li> <li><input type="checkbox"/> Promote mariculture/aquaculture as a means of improving on the diet of the people of the Turks and Caicos Islands.</li> <li><input type="checkbox"/> Promote mariculture/aquaculture as a tool to rebuild and sustain stocks which are at risk of overexploitation</li> </ul>



**Management Strategy**

- Develop and publicize policy for mariculture/aquaculture development in the TCI
- Develop regulations and operational guidelines to facilitate the development of responsible mariculture/aquaculture.
- Encourage investment in sustainable mariculture/aquaculture enterprises in the Turks and Caicos Islands.
- Forge partnership with other government organization and private sector that would promote research and development in mariculture/aquaculture.
- Promote development of mariculture to provide opportunities for commercial diversification in the marine fisheries, ecologically acceptable value-added products, tourism and education.



## Action Plan for Mariculture/Aquaculture in TCI

Issues	Action	Implementation Strategy	Resources Required
<p>Unknown ecological and environmental impact aquaculture facilities have or will have on the environment</p>	<p>Develop effective procedures specific to aquaculture to undertake appropriate environmental assessments and monitoring with the aim to minimize adverse ecological changes and related economic and social consequences resulting from water extraction, land use, discharge of effluent, use of drugs or chemicals and other aquaculture activities</p>	<p>Develop policy, legislation and regulations to govern aquaculture development</p> <p>Collaborate with Environmental Health Department to develop health and water quality standards for mariculture / aquaculture</p> <p>Develop specific procedure and protocols for aquaculture facilities</p> <p>Encourage responsible aquaculture management practices</p>	<p>Collaboration between investors, mariculture managers.</p> <p>Collaboration with Department of Environmental Health, Planning Department, National Trust, DECR, Protected Areas Department to develop guidelines.</p> <p>Ministerial commitment, AG to develop legislations</p>
<p>Ad hoc approach to aquaculture development</p>	<p>Develop and implement mariculture/aquaculture strategy and plan in collaboration with investors</p>	<p>Develop and implement a national mariculture/ aquaculture strategy and plan.</p> <p>Develop TOR for EIA for mariculture activity and develop guidelines for proposals by potential investors.</p> <p>Promote responsible development and aquaculture practices</p> <p>Make mandatory the development and implementation of an aquaculture development strategy and plan by the investor, with clear advanced evaluation of the effects of aquaculture development on genetic diversity and ecosystem integrity, based on the best available scientific information</p>	<p>Collaboration between investors, mariculture managers.</p> <p>Collaboration with Department of Environmental Health, Planning Department, National Trust, Protected Areas Department to develop guidelines.</p> <p>Ministerial commitment, AG to develop legislations</p>



<p>Lack of standard operating procedures</p>	<p>Develop guidelines for production which are sustainable and have minimum impact on the environment</p>	<p>Promote technologies which improve selection and use of appropriate feeds, feed additives and fertilizers.</p> <p>Promote effective farm and fish health management practices favouring hygienic measures and vaccines.</p> <p>Promote safe effective and minimal use of therapeutants, hormones and drugs, and antibiotics and other disease control chemicals.</p> <p>Ensure that the disposal of waste, dead or diseased fish, and other hazardous chemical input do not constitute a hazard to human health and the environment.</p> <p>Ensure the food safety of aquaculture products</p> <p>Promote quality control management practices which maintain product quality and improve their value through particular care before and during harvesting, processing, storage and transportation of the product.</p>	<p>Collaboration between investors, mariculture managers.</p> <p>Collaboration with Department of Environmental Health, Planning Department, National Trust, Protected Areas Department to develop guidelines.</p> <p>Ministerial commitment, AG to develop legislations</p>
	<p>Emulate good standard operating procedures from other mariculture facilities throughout the region.</p>	<p>Collect existing information from the region on mariculture activity.</p> <p>Implement, where appropriate, similar operating procedures to mariculture facilities of the Turks and Caicos Islands.</p> <p>Develop effluent discharge (water quality) reference for mariculture facility</p>	<p>Collaboration with Parks Department, Environmental Health.</p> <p>Ministerial commitment to approve of legislations.</p> <p>AG Chambers to develop legislations</p>



<p>Insufficient use of aquaculture as a tool to rebuild or augment the stocks</p>	<p>Evaluate the use of aquaculture as a tool to rebuild or augment fish stocks</p>	<p>Encourage aquaculture facilities to release cultured organisms back into the wild based on predefined guidelines and scientific research in order to rebuild or augment specific depleted fish stocks.</p> <p>Collaborate with aquaculture facilities on research for releasing juvenile back into the wild.</p> <p>Develop long term monitoring program in collaboration with aquaculture facilities.</p>	<p>Commitment of Mariculture facilities and DECR, and PAD to conduct these researches.</p> <p>Funds for research.</p>
<p>Risk of the introduction of non-favourable species and culturing for the aquarium trade</p>	<p>Implement guidelines and legislation to discourage the introduction of non-favoured specie</p>	<p>Develop approved species list and promote the culture for aquarium trade</p>	<p>Collaboration with DECR, investors, mariculture managers and utilize existing information</p>
<p>Risk of species being removed from the wild for the aquarium trade</p>	<p>Develop a plan and safeguards for taking of aquarium species while promoting culture of and/or proponents having documented research that ensures environmental sustainability.</p>	<p>Develop guidelines for proposals.</p>	<p>DECR to develop proposal and guidelines.</p> <p>Custom Office to monitor the export of species.</p>
<p>No initiatives for locals to enter mariculture</p>	<p>Encourage local enterprises in aquaculture.</p>	<p>Designate appropriate enterprise zones for mariculture</p> <p>Encourage low interest loans for mariculture</p> <p>Explore the possibility of using the conservation fund to subsidize feasibility studies and development of business plans.</p> <p>Provide opportunities for training attachments</p> <p>Integrate mariculture in the education systems</p>	<p>TCI invest</p> <p>Conservation fund</p> <p>Internal budgets</p> <p>Seek international funding</p>



<p>Lack of capacity building and technical support</p>	<p>Explore opportunities for capacity building for local entrepreneurs in this area.</p>	<p>Initiate training in mariculture.</p> <p>Promote participation in the World Aquaculture Workshop</p>	<p>International and TCIG funding</p>
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<sup>2</sup>The action point and implementation strategy for aquaculture management are consistent with Article 9 of the FAO code of conduct for responsible fisheries.

# GLOSSARY

Term	Definition
Caribbean regional Fisheries Mechanism (CRFM)	Provides advice on various aspects of Fisheries Management for 18 CARIFORUM countries and its major objectives is strengthening regional cooperation in Fisheries in the CARICOM region.
Catch Per Unit Effort (CPUE)	The number or weight of fish caught by one unit of fishing effort. Typically, effort is a combination of gear type, gear size, and length of time the gear is used. Catch per unit effort is often used as an index of relative abundance for a particular fish.
Catch	The total number or weight of fish capture from an area over some period of time. This includes fish that are caught but released or discarded instead of being landed. The catch may take place in an area different from where the fish is landed.
Charter Boat/ companies	A boat or a company containing boats available for hire, normally by a group or people for a short time. A charter boat is usually hired by anglers.
Coastal Zone	The marine and terrestrial areas continuous with the coastline which is potentially impacted by inland and marine activities.
Coastal Zone Management	Integrated process of information gathering, planning, decision-making, allocation of resources, and formulation and enforcement of regulations by which the coastal zone management authority controls the present and future behaviour of the interested parties in the coastal zone, in order to ensure the continued productivity of living resources
Commercial Fishing	A term related to the whole process of catching, processing and marketing fish and shellfish. It also refers to and includes fisheries resources, fishermen, and related business directly or indirectly involved in harvesting, processing or sales.
Effort	The amount of time or fishing power used to harvest fish. Fishing power can be expressed in terms of gear size and quantity, boat size, horsepower, fuel consumption, etc.
Environnemental Impact Assesment (EIA)	An analysis of the expected impacts of a proposed development would have on the environment

Exclusive Economic Zone (EEZ)	All waters beyond and adjacent to the territorial sea up to a maximum of 200 nautical miles (including territorial sea). In the EEZ, the State has sovereign rights and responsibilities as defined in the UN Convention on the Law of the Sea.
FAO	Food and Agriculture Organization of the United Nations
Fisher	A person (male or female) who harvests fish or shellfish
Fishery	All activities involved in catching a species of fish or group of species
Fishery Advisory Committee (FAC)	A group of people appointed by a fisheries management authority to review information and give advice pertaining to the management and development of the fishery. Typically, members of the FAC represent key industry groups or government agencies involved in the fishery.
Fisheries Management	Integrated process of information gathering, planning, decision-making, allocation of resources, and formulation and enforcement of fishery regulations by which the fisheries management authority controls the present and future behaviour of the interested parties in the fishery, in order to ensure the continued productivity of living resources.
Fisheries Management Plan (FMP)	A plan to achieve specified management goals and objectives for a fishery or set of fisheries. It includes data collection, analyses, and management measures for the fishery. The FMP guides the direction and scope of fishery development, conservation and D.E.C.R.'s work plans, including budget and human resources.
ICCAT	International Commission for the Conservation of Atlantic Tunas.
Juvenile	A young fish or animal that has not reached sexual maturity
Landings	The number or weight of fish unloaded at a dock by commercial fishermen or brought to shore by recreational fishermen for personal use. Landings are reported at the points at which fish are brought to shore. Note that landings, catch, and harvest define different things.



Limit Reference Point (LRP)	“A Limit Reference Point indicates a state of a fishery and/or a resource which is considered to be undesirable and which management action should be avoid. This correspond to some minimum condition (e.g. a dangerously low spawning biomass) or some maximum condition (a high rate of decline in stock size, or a high mortality or harvesting rate) at which point a management response which has been negotiated earlier with the participants in the fishery, is automatically triggered.”
Marine Protected Areas (MPA)	A system of coastal or marine areas within which multi-user activities are controlled.
Maximum Sustainable Yield (MSY)	The largest average catch that can be taken continuously (sustained) from a stock under average environmental conditions.
Maximum Economic Yield (MEY)	This occurs at the effort level yielding the greatest margin of revenue over cost from the resource.
Monitoring	The continuous requirement for the management of fishing effort characteristics and resource yields
Nursery	The part of a fish's or animal's habitat where the young grow up. Mangroves are prime nursery areas for many fish species.
Optimum Sustainable Yield (OSY)	The optimum harvesting level in which high catch and economic benefits are maintained.
Overfishing	Harvesting at a rate greater than that which will meet the management goal.
Pelagics	Refers to fish that live in the open sea, away from the sea bottom.
Quota	The maximum number or weight of fish that can be legally landed in a time period. It can apply to the total fishery or an individual fishermen's share.
Reef Fish	Species of fish found around coral reefs and artificial reefs.



Shared Stocks	Fish stocks that occur at some point in their life history in the water of more than one country and are hence shared by the fishers of the countries. Responsibility for management must also be shared.
Sport Fishery	Often used synonymously with the term recreational fishery. Harvesting fish for personal use, fun, and challenge. Recreational fishing does not include the sale of catch.
Stock	A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. The part of the fish population under consideration from the point of view of actual or potential utilization.
Straddling Stock	A grouping of fish that occurs at some point in its life history in the waters of both a country and the high seas (international waters)). Often such fish are migratory. Responsibility for management must be shared between the coastal state and the international fishing nations.
Surveillance	The degree and types of observations required to maintain compliance with the regulatory controls imposed on fishing activities.
Total Allowable Catch (TAC)	The annual recommended catch for a species or species group. Often used Synonymously with quota.
Target Reference Point (TRP)	A Target Reference Point indicates to a state of a fishing and /or resource which is considered to be desirable and at which management action, whether during development, harvesting or stock rebuilding, should aim.
Underutilised Species	A species of fish that has the potential for additional harvest.



# ACCRONYMS

CPUE	Catch Per Unit of Effort
CRFM	Caribbean Regional Fisheries Mechanism
EIA	Environmental Impact Assessment
EEZ	Economic Exclusive Zone
FAO	Food and Agricultural Organization of the United Nations
FAC	Fisheries Advisory Committee
FMP	Fisheries Management Plan
ICCAT	International Commission for the Conservation of Atlantic Tuna
LRP	Limit Reference Points
MPA	Marine Protected Areas
MSY	Maximum Sustainable Yield
MEY	Maximum Economic Yield
OSY	Optimum Sustainable Yield
TRP	Target Reference Point
TAC	Total Allowable Catch
TCI	Turks and Caicos Islands