

## Fisheries of the Turks and Caicos Islands: Status and Threats

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### ABSTRACT

The Turks and Caicos Islands (TCI) are home to one of the last healthy queen conch fisheries in the Wider Caribbean. Indeed, the Turks and Caicos populations of *Strombus gigas* are deemed by the Scientific Committee of CITES to be of no concern, a starkly different situation from that of many other fisheries in the region. Concurrently, however, the fishery for spiny lobster, *Panulirus argus*, gives rise to rather more concern, though the exact status of the stock is difficult to assess. These two fisheries are managed completely differently, with a closed season, and national size and gear restrictions for the spiny lobster, but through a CITES quota for queen conch, even though the TCI are not a member to that convention, along with national gear and size restrictions. While fisheries are not the primary industry of the TCI, ranking a mere third in percentage of GDP behind tourism and offshore banking, a large part of the population still depends on healthy fisheries, either directly or indirectly. This is particularly true in some of the more remote islands, like South Caicos where up to 70% of the population is dependent on this resource. In addition, as the tourism industry develops, new pressure is being applied to finfish stocks even though, here again, very little is known on the status of the stocks. This paper summarizes the current state of these three fisheries, identifies areas of success and relative difficulties and assesses the new governmental policy, currently developed by the Department of Environmental and Coastal Resources to address these growing pressures.

**KEY WORDS:** Spiny lobster, queen conch, finfish fishery, fisheries management plan, stakeholder participation, open access, precautionary approach, Wider Caribbean.

### Las Pesquerías de las islas de Turcos y Caicos: Estado y Amenazas

Las islas de Turcos y Caicos (TCI) albergan una de las pesquerías más saludables del caracol reina en el Gran Caribe. De hecho, las poblaciones de *Strombus gigas* de Turcos y Caicos han sido catalogadas como poblaciones sin amenazas por el comité científico de CITES, una situación destacada con relación a las pesquerías en muchas islas de la región. Sin embargo, al mismo tiempo, la pesquería de langosta espinosa, *Panulirus argus*, ha incrementado su amenazas, a pesar de que determinar el estado exacto de este stock ha sido difícil. Estas dos pesquerías son manejadas de una manera completamente diferente, para la langosta espinosa hay una veda, determinación de tamaños y restricciones de artes de pesca, mientras que el caracol reina tiene una cuota CITES, aunque TCI no son miembros de la convención, además de restricciones nacionales de tamaños y artes de pesca. Mientras que las pesquerías no son la industria principal de TCI, consideradas solo en el tercer nivel en porcentaje del GDP después del turismo y la banca internacional, una gran parte de su población aun depende de una pesca saludable directa o indirectamente. Esto es particularmente cierto en algunas de las islas mas remotas, como Caicos sur, donde hasta un 70% de la población depende de este recurso. Con el desarrollo de la industria del turismo, hay nuevas presiones sobre los stocks de peces de escama, a pesar de que poco se conoce sobre su estado natural. Este artículo presenta el estado actual de estas tres pesquerías, identifica las áreas de éxito y dificultades y analiza las nuevas políticas gubernamentales, recientemente desarrolladas por el departamento ambiental y de recursos costeros, y discute estas presiones crecientes. Finalmente, se discute el caso del acceso abierto como un factor clave en las situaciones de presiones excesivas.

**PALABRAS CLAVES:** Langosta espinosa, caracol de pala, peces de escama, plan de manejo pesquero, participación de usuarios, acceso abierto, esquema de principio de precaución, Islas de Turcos y Caicos.

## INTRODUCTION TO THE TURKS AND CAICOS ISLANDS

The Turks and Caicos Islands (TCI) are a British Overseas Territory located south of the Bahamas Chain, in the northern Wider Caribbean. Because of this legal status, the Government of the TCI has the authority to manage its marine living resources, but the Government of the United Kingdom has the authority to enter into treaties and other legally binding instruments on behalf of the TCI. The small archipelago of the TCI is heavily dependent on the health of marine ecosystems, as they support the development of a booming tourism industry as well as rich fisheries of queen conch, spiny lobster and a burgeoning finfish fishery. The third source of development in the TCI is offshore banking, which is not directly related to the status or management of marine resources. In spite of a recent boom in tourism, the TCI are home to healthy marine ecosystems, including extensive mangroves, seagrass beds, and coral reefs. While all but a handful of islands host at least some level of tourism (with most tourism directed toward Providenciales and Grand Turk, see map below), the heaviest level of fishing occurs on South Caicos – where up to 70% of the population depends, directly or indirectly, on fisheries – and, to a lesser degree on Providenciales. As such, the development of the TCI is directly linked to the health of its marine

habitats and the Government has adopted a proactive strategy to ensure that they do not become threatened by unfettered fishing. This paper reviews the status of each of the three main fisheries, identifies the challenges and strategies identified by the Government of the TCI and highlights the risks and opportunities that still prevail in the TCI.

## STATUS OF THE CONCH FISHERY

*Strombus gigas* (queen conch) is the largest export for commercial trade in the TCI. The Department of Environmental and Coastal Resources (DECR) Fisheries has been collecting catch data since 1887, but effort data has only been collected since 1974. Nevertheless, this series of data is one of the most extensive data collections in the Caribbean region. Queen conch landings have fluctuated from 5,773,906 pounds (lbs.; 2,619 MT) in 1943 to an all time low of 36,155 lbs. (16.4 MT) in the aftermath of hurricane Camille in 1969. The fishery rebounded and has remained fairly consistent at a current Maximum Sustainable Yield (MSY) of 1,674,990 lbs (759 MT) in 2004 (Figure 2). Fluctuations may have resulted from over-fishing and other independent factors such as climatic variations, World Wars I and II and shifts to more lucrative employment (Medley and Ninnes 1999, Bene and Tewfik 2001, Clerveaux and Vaughan 2001).

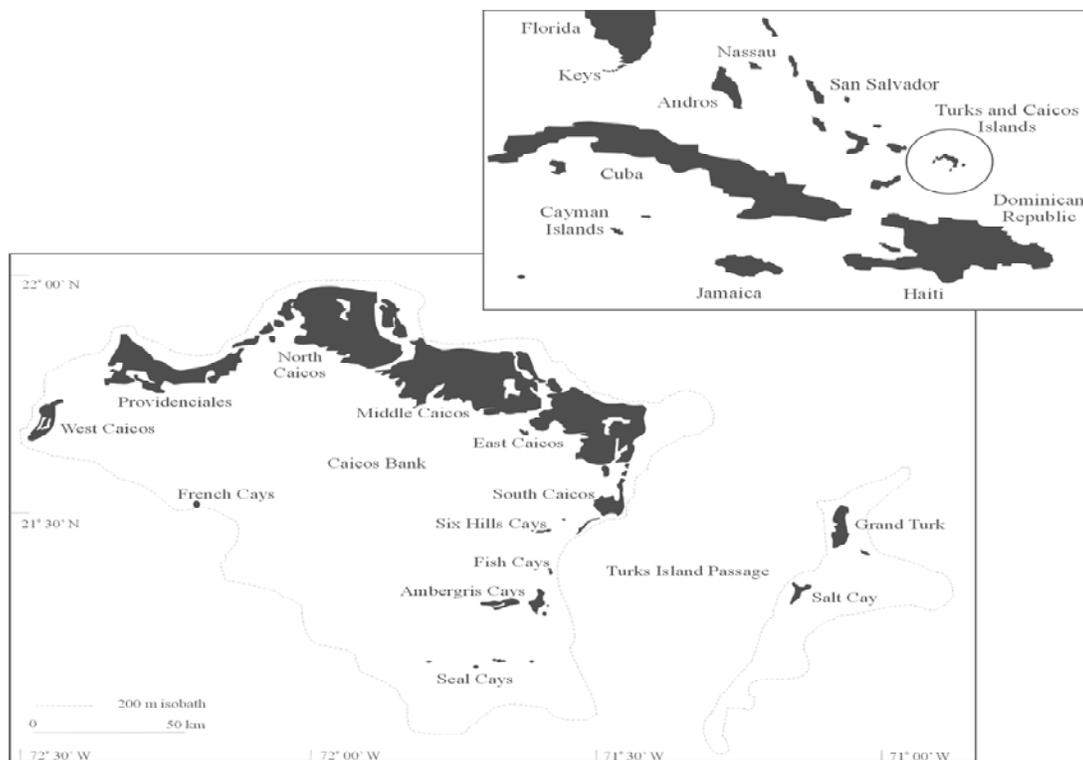
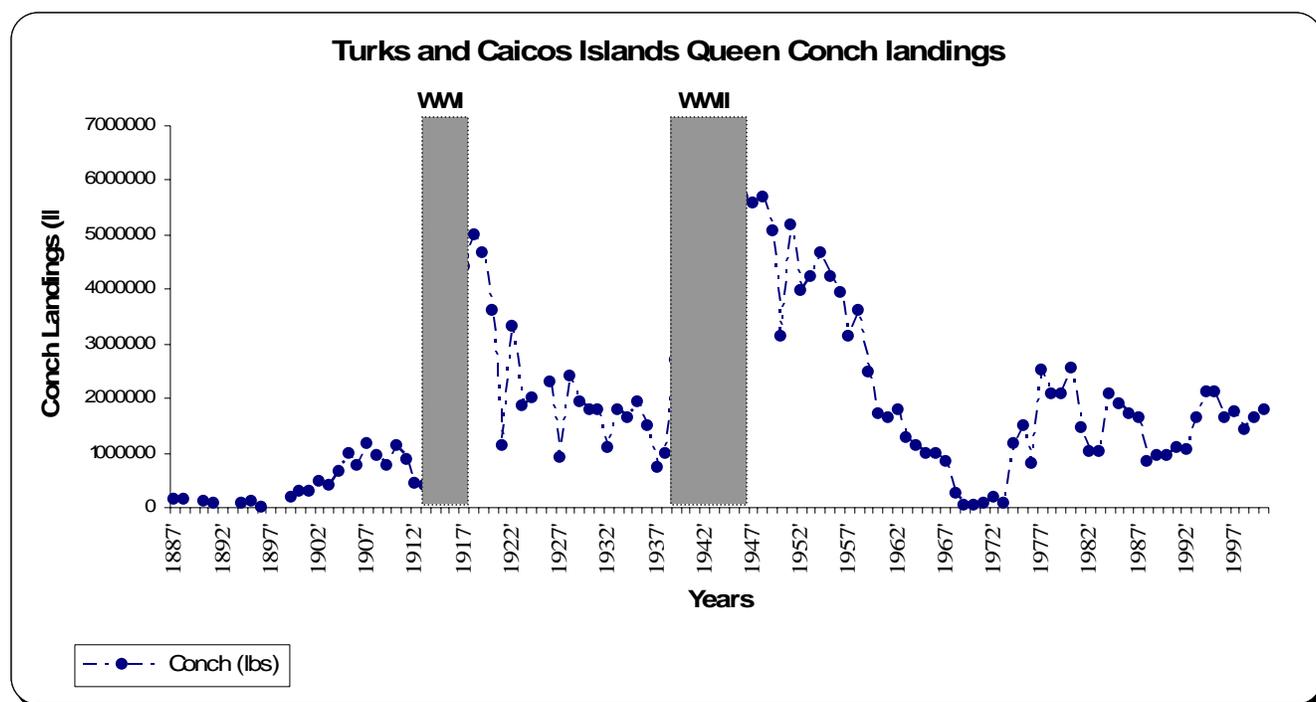


Figure 1. The Turks and Caicos Islands



**Figure 2.** Historical catch landings of Queen Conch, showing the trends and fluctuations in catch over the years.

Economically, the queen conch is the second most valuable fishery in the TCI. The TCI export approximately 650,000 lbs. of wild harvested conch meat, 138,000 lbs. of conch trimmings, 7,000 lbs. of mariculture conch meat, 2,000 live conch from mariculture and 6,000 lbs. of conch shells and shell derivatives.

Even though the queen conch is fished extensively throughout the Turks and Caicos Islands, its population is considered stable, mainly because the TCI Governments has adopted a precautionary approach to fisheries management. Though the TCI are not a party to the Convention on International Trade of Endangered Species of Flora and Fauna (CITES), *Strombus gigas* is listed on Appendix II of that Convention, which submits international trade in that species to a special permit procedure. Almost of all of the queen conch harvested in the TCI is exported to the United States, which, since it is a Party to CITES, requires that the TCI abide by the restrictions and conservation measures adopted by CITES. As a result, the TCI is actively implementing CITES and its protocols. In addition, conch fishing is restricted to an open fishing season and minimum catch sizes designed to avoid the harvesting of immature juveniles.

A Scientific Authority and a Management Authority have been created, but not yet mandated, to aid in the monitoring of the species. The Scientific Authority suggests a national quota for queen conch based on a Schaefer Surplus Model and other data (i.e. local consumption). The quota is then implemented by the Management

Authority. With many years of catch and effort data, the MSY has been calculated at near 1.6 million lbs. of landed conch over the past few years. Scientific research based on cleaning has provided calculations to approximate a national annual export quota of approximately 600,000 lbs. (272,160 kg) of clean meat.

The TCI also have created a CITES export permit that is managed and monitored by the Management Authority. Each Class "A" Processing Plant is requested to obtain a permit for export, which is issued once it has been determined that the plant is within the overall export quota. The Fisheries Department has investigated whether the Schaefer Surplus Model is consistent with the current level of stock. In 1999, a visual survey was conducted on the Caicos Bank (Clerveaux and Danylchuck 2001) and upon analysis of the visual survey, it was determined that the Schaefer Model (quota) was consistent with catch landings on the Caicos Bank.

Throughout the Caribbean Region, many protected areas have been established for fisheries management purposes, where it is expected that protected areas can and will enhance fisheries yields. Various studies have been conducted within the East Harbour Conch and Lobster Reserve in South Caicos. It was found that there were differences in densities and age structure, with juveniles being significantly denser in fished areas than adults (Tewfik and Bene 1998). Total densities in algal plain in fished areas were 687.2 conchs/ha versus densities of 2,162 conchs/ha in protected areas. After calculations, it was

determined that the overall mean density for both protected (EHCLR) and fished areas (Caicos and Turks Banks) was reported to be the highest in the region at 426.53 conchs/ha.

The DECR is now attempting to fill any information gaps that may still remain. For instance, local consumption of conch had always been observed, but until 2004 no data had been collected. In 2004 a survey was conducted on the local residents of the TCI to determine how often and what quantity of conch was being consumed. The survey was completed, and a final consumption index was determined for the TCI. That index was then utilized in the Schaefer Model for the 2005 - 2006 conch season to determine a MSY. Information still needs to be collected on tourist consumption rates, shipment of dried conch, and illegal poaching.

### Status of the Lobster Fishery

*Panularis argus* (spiny lobster) is one of the most predominant species for commercial trade in the TCI. The Fisheries Department of DECR has been collecting catch and effort data since 1947. The landings have fluctuated over the years with a peak in 1992 at 1,312,795 lbs. (590 MT) and a decline of 400,375 lbs. (320 MT) in 2001/2002 fishing season (Figure 3).

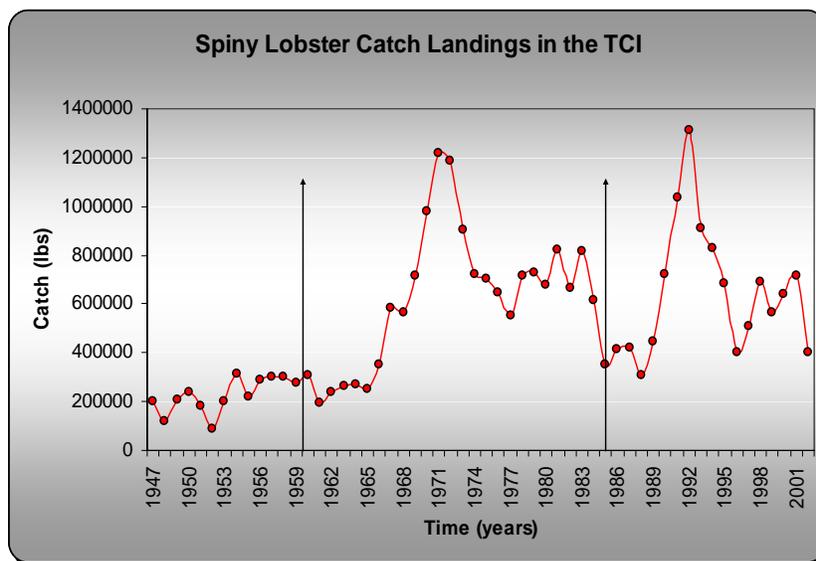
Even though the catch per unit of effort (CPUE) has remained relatively stable around 58-kilograms/man-day from 1985 to 2004, over 30% of the total lobster catch is landed during the month of August, right after the opening of the lobster season.

In 2001, an assessment of the spiny lobster stocks of the TCI was conducted utilizing the Gordon-Schaefer and Thompson-Bell models. At that time, both models

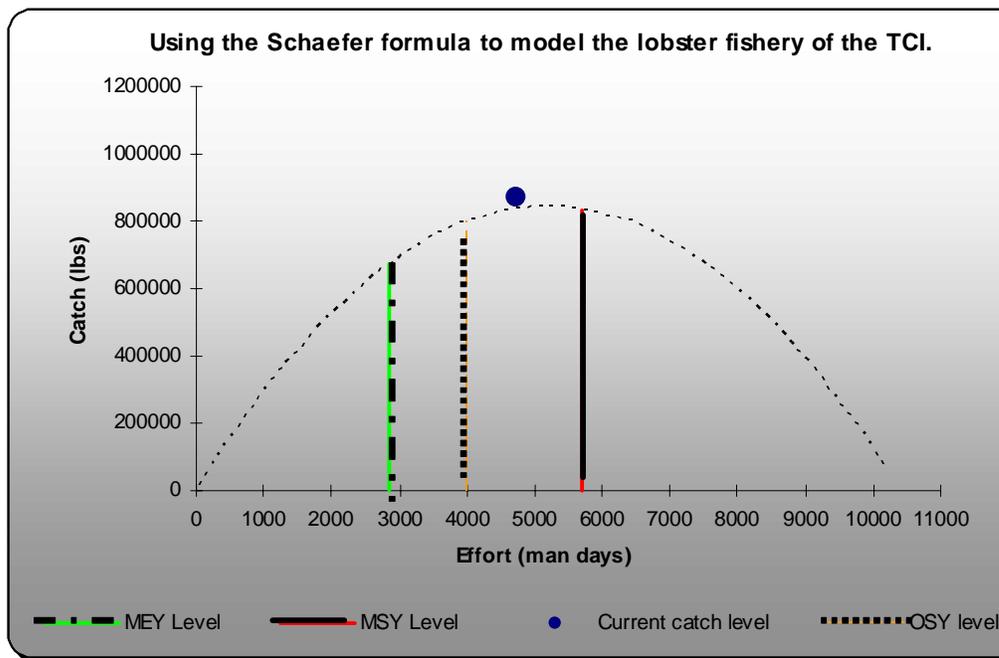
indicated that the fishery was operating near the Maximum Sustainable Yield (MSY). Both models indicated that the TCI lobster fishery is an open access system and that the fishery is operating close to the Maximum Economic Yield ( $f_{MSY}$ ) (Figure 4). If the fishing effort continues to increase, a resulting loss in profits can be expected (Clerveaux and Puga 2001). The Fisheries Department also conducted an analysis on morphometric sampling from 1989-1998 and 2003-present. Once the lobsters were landed (not purchased by processing plants), they were measured for weight, size, and reproductivity status. The analysis in 2001 suggested that approximately 41.3% of the lobsters landed annually were comprised of undersized lobster. This converts to approximately 22% of the total landed catch that is sold to local restaurants, hotels and for personal consumption. In the course of the 2005-2006 fishing season, lobsters were also measured to determine what part of the catch, if any, is still comprised of undersized lobsters.

In addition, over the past 20+ years an increase in use of noxious substances has been observed. Bleach or Joy mixed with gasoline has been utilized to flush lobsters from their dens to decrease effort and increase catch. The Fisheries Department, in cooperation with the School for Field Studies, has conducted research on a starch iodide swab technique to determine if any bleach had been used to retrieve lobsters. The study was successful with reasonable accuracy and the Turks and Caicos Conservation Fund has funded field test kits for fisheries conservation officers to utilize during the season.

Currently, the DECR is attempting to determine a recruitment index of lobster to the TCI, following a protocol set by the Cuban fishery in determining the recruitment.



**Figure 3.** 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.



**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.

### Status of the Finfish Fishery

The finfish fishery of the Turks and Caicos Islands has not been fully utilized heretofore. The Fisheries Department has had limited success in collecting information regarding finfish, including shallow reef fish, deep-slope fish, coastal pelagic fish, and large pelagic fish. The catch history of these various fisheries is unknown. Finfish are usually sold directly to hotels, restaurants, and fish markets, which are for local consumption. It is believed that the fin-fishery is underutilized, where, for instance, Ninnes reported in 1990 a potential yield of 70-140 kg/km<sup>2</sup> off the shelf perimeter of the Turks and Caicos Islands (Caicos Bank, Turks Bank, and Mouchoir Bank).

### Governmental Policy and Fisheries Management

The Turks and Caicos Islands have been making large strides in the management of the various fisheries. In 2004, the Fisheries Management Plan was reviewed and further revisions are in process; in addition, a Fisheries Policy was drafted. The two are currently under review by the Executive Council of the Government. The Management Plan provides a background to the various species within the TCI and then breaks down the fisheries to provide specific management criteria, action points, control points, etc. For all fisheries, the approach taken is a combination of gear restrictions (prohibition of SCUBA gear), size limits (for both spiny lobster and queen conch), open and closed season, protected areas, and, in the case of queen conch, an export quota.

### Management Strategies for Conch

*Objective* — To promote national and international collaboration in research and management, while maintaining effort levels in the queen conch fishery at or below the predetermined reference point (e.g. MSY); and exploring options of optimizing economic earnings, including foreign exchange and the feasibility of expanding markets for derivatives of conch (shells, trimmings, ornaments).

Within the Fisheries Management Plan, management strategies have been created, the first of which, is to establish a Total Allowable Catch (TAC) for the conch fishery. This strategy will have clearly defined reference points such as a Target Reference Point (TRP) and a Limit Reference Point (LRP). A second strategy is to discourage part-time fishers and foreign fishers from participating commercially in the lobster fishery. This strategy has been implemented by the DECR by increasing license fees.

Another management strategy is to explore the feasibility of modifying the regulation of minimum size from shell-length to shell lip thickness, which could prove a better indicator of size at sexual maturity. In addition, the phenomenon of “stunting” in queen conchs found on the Caicos Bank still needs to be investigated further. The Department is also trying to encourage local markets for lobster derivatives. This could allow for the reduction in processing waste and improve the resource users’ net income.

Finally, the Department is looking to enter into a bilateral and/or multilateral agreement with neighboring

countries such as the Bahamas, Dominican Republic, and Cuba. Through these agreements the Department hopes to improve the management of the fishery, increase enforcement, and improve research collaboration. Some of these agreements could involve the FAO-WECAF and/or CRFM to aid in fostering a sustainable regional management of the conch fishery.

### Management Strategies for Lobster

*Objective* — To discourage destructive fishing practices by effective enforcement so that stocks can be maintained at all times above 50% of mean unexploited level, while improving the net (foreign) exchange earnings and developing a local market for lobster derivatives in order to reduce processing waste.

Within the Fisheries Management Plan, management strategies have been created, the first of which, is to establish a Total Allowable Catch (TAC) for the lobster fishery. This strategy will have clearly defined reference points such as a Target Reference Point (TRP) and a Limit Reference Point (LRP). A second strategy is to discourage part-time fishers and foreign fishers from participating commercially in the lobster fishery. This strategy has been encouraged by the DECR by increasing license fees.

Another management strategy is to prohibit restaurants and hotels from having in their possession or offering for sale lobster on their menu during the closed season. Here, the Department has already created and passed an amendment to the Fisheries Protection Ordinance. This amendment does not allow restaurants / hotels to have lobster for sale during the closed season.

The Department is also trying to encourage local market for lobster derivatives. This could allow for the reduction in processing waste and improve the resource users' net income.

Finally, the Department is looking to enter into a bilateral and/or multilateral agreement with regional countries such as the Bahamas, Dominican Republic, and Cuba. Through these agreements the Department hopes to improve the management of the fishery, increase enforcement and improve research collaboration. Some of these agreements could involve the FAO-WECAF and/or CRFM to aid in fostering a sustainable regional management of the lobster fishery.

### Management Strategies for Finfish

*Objective* — To promote the sustainable development of the fin-fish fisheries resources adopting cautious conservation and management measures in conjunction with the 'Guidelines on the precautionary principle' (FAO *Technical guidelines for Responsible Fisheries*. No.2. Rome, FAO, 1996)

The Fisheries Department plans to implement the precautionary principle, as embodied in the 1995 UN Agreement on Straddling Fish stocks and Highly Migratory Fish Stocks. It also intends to update the 1990 finfish stock

assessment carried out by Medley and Ninnes, by conducting a rapid survey to determine current stock levels. After a stock assessment has been conducted, the DECR will then establish harvesting limits (Quota or TAC) with clearly defined reference points, e.g. Target Reference Point (TRP) and Limit Reference Point (LRP), taking into consideration the annual TAC external extremities such as unreported catch destined for home consumption and poaching by foreign vessels.

To establish a basis for stock assessment, protection of stocks and protection of spawning aggregations, biological research will be conducted to develop regulations such as minimum size, protected areas, and closed seasons. Currently, the DECR is developing a monitoring strategy that would allow for the collection of catch and effort data. The Department is also attempting to implement legislation/regulations to promote catch and release by sport fishers.

The Turks and Caicos Islands are also active participants in international fishing agreements such as ICCAT and CRFM. These agreements are to foster sustainable regional management of the coastal and large pelagics.

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