Fisheries Landings and Trade of the Turks and Caicos Islands

Murray A. Rudd

Mansholt Graduate School
Wageningen University
Wageningen, The Netherlands

Fisheries & Oceans Canada
Policy&Economics Branch
Maritimes Region
176 Portland St.
PO Box 1035
Dartmouth, Nova Scotia
Canada
B2Y 4T3
Phone: (902)-426-4825, Fax: (902)426-6767
Email: RuddM@dfo-mpo.gc.ca

ABSTRACT

The Turks and Caicos Islands is a sparsely populated island country located at the southern end of the Bahamian Archipelago. The Caicos Bank has supported an export-oriented queen conch fishery for over 100 years. More recently, an export-oriented spiny lobster fishery developed and a burgeoning domestic market for reef fishes is currently developing as local tourism grows. This paper provides an overview of fisheries landings and trade in the Turks and Caicos over the past century.

BACKGROUND

The Turks and Caicos Islands (TCI) are located at the southern end of the Bahamian Archipelago (Figure 1) and are comprised of three platforms: the Caicos, Turks and Mouchoir Banks. Caicos Bank is a shallow, oolitic limestone platform covering an area of about 6,140 km^2 (Olsen, 1986) and is comprised of sand (64%), mixed coral and algae (18%), coral reefs (7%), and other habitats (11%), typically at depths of 1-5 m. Extensive coral reefs fringe the shelf edge and are characterized by steep drop-offs. The smaller Turks Bank (about 324 km^2) is comprised mainly of sand (43%), mixed coral and algae (29%), coral reefs (26%), and other habitats (3%) (Olsen, 1986). Mouchoir Bank (20.6^o N, 70.4^o W; 1,109 km^2) is located east of Turks Bank and consists largely of coral and sand.

The Caicos Bank supports export-oriented fisheries for queen conch (*Strombus gigas*) and spiny lobster (*Panulirus argus*), and a domestic fishery for 'scale-fish' (primarily reef fish, including groupers, snappers, grunts and hogfish), which are most often landed as by-catch by lobster fishers.

Virtually all commercial fishing takes place on the Caicos Bank. South Caicos is the traditional home of the artisanal fleet, but landings of conch and reef fishes on the island of Providenciales ('Provo') have increased over the last two decades as Provo has been developed for tourism. Limited subsistence fishing occurs on the Turks Bank, where fishers seek reef fishes and lobsters for local use. TCI fishers seldom visit Mouchoir Bank, although there are anecdotal reports of illegal fishing for lobsters and reef fish in the 1980s and 1990s by boats from the Dominican Republic and Haiti.

There are currently about 60 commercial licenses operating from South Caicos, 75 from Provo, and 14 from Grand Turk (Halls *et al.*, 1999). Almost all lobster is landed in South Caicos, while the conch total allowable catch (TAC) is split evenly between processors (currently three in South Caicos and two in Provo). Small 14-ft fiberglass runabouts equipped with 70 to 110 hp outboards are popular for fishing as they handle waves well, are maneuverable, and can be used to reach fishing grounds up to 40 km from home port.

The Department of Environment and Coastal Resources (DECR) manages the conch and lobster fisheries using traditional tools. As an Overseas Dependency of the United Kingdom, the TCI has received technical support for fisheries management and has extensive (albeit imperfect) landings data. Resource assessments have been undertaken for conch and lobster (Medley and Ninnes, 1997, 1999). A combination of TACs, seasonal closures, gear restrictions (a prohibition on SCUBA being the most important), minimum size limits for conch and lobster, and other restrictions are used to manage export-oriented conch and lobster fisheries. Despite the regulations, compliance with rules has been poor since the 1960s (Olsen, 1986; Raven, 1994; Rudd *et al.*, 2001). Rampant drug smuggling starting in the 1980s also encouraged a culture of distrust and

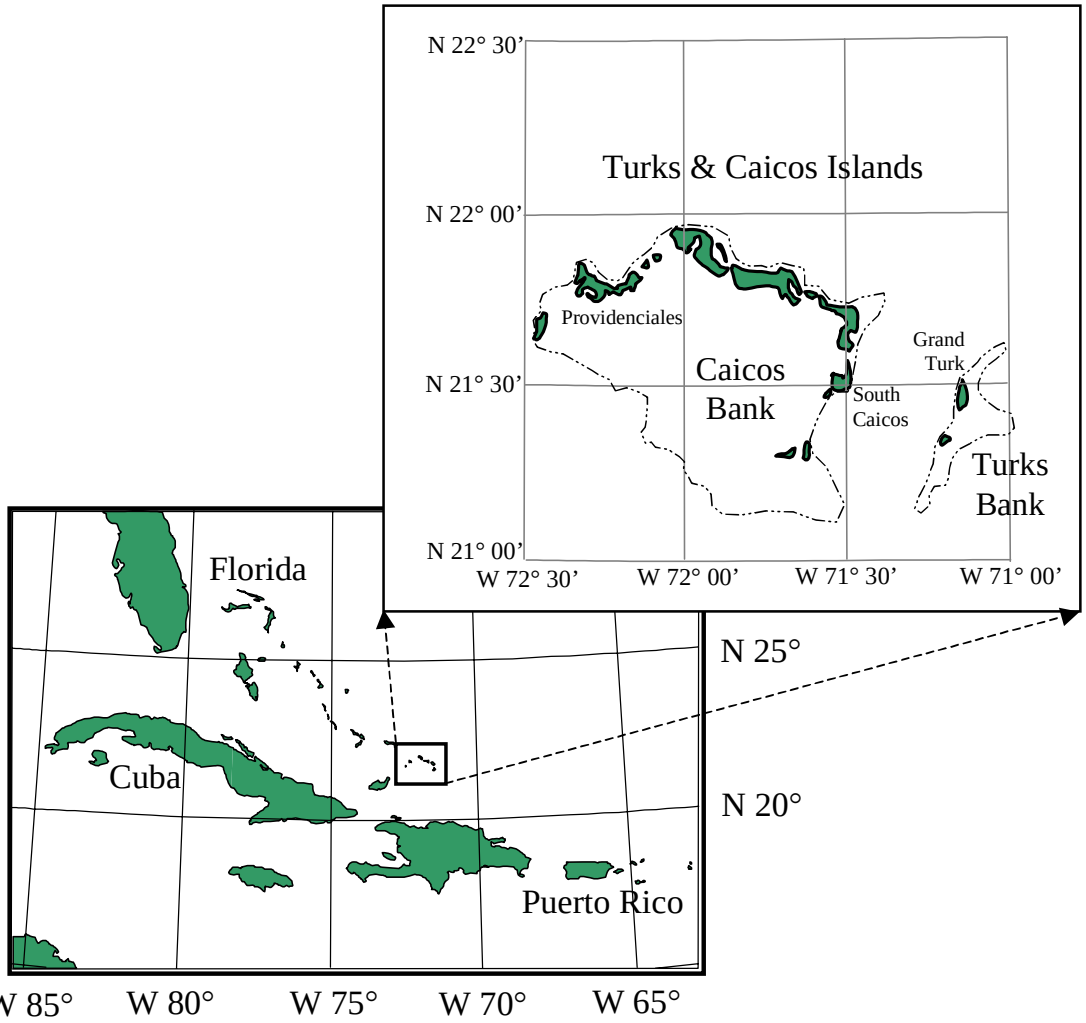

Figure 1: Location of the Turks and Caicos Islands, showing approximate 100-m depth contour for Caicos and Turk Banks

disregard for authority in the TCI[1] Besides DECR data and reports (Homer, 2000a, 2000b, 2000c; Clerveaux and Danylchuk, 2003; Clerveaux and Vaughan, 2003), a number of reports and articles have been completed relating to fisheries and fisheries habitat in the TCI, including work sponsored by the British government (Medley and Ninnes, 1994, 1997, 1999; Ninnes, 1994; Raven, 1994; Ninnes and Medley, 1995; Medley, 1998; Halls *et al.*, 1999; Bennett *et al.*, 2001; Bennett and Clerveaux, 2003), by faculty at one time associated with the Center for Marine Resource Studies, South Caicos (Green *et al.*, 1996, 1997, 1998a, 1998b; Steiner, 1999; Tewfik and Béné, 1999; Béné and Tewfik, 2001; Rudd, 2001, in press a, b; Rudd *et al.*, 2001, 2003; Rudd and Tupper, 2002; Tupper, 2002; Tupper and Rudd, 2002; Danylchuk *et al.*, 2003), and other miscellaneous books, reports and theses (Doran, 1958; Hesse, 1976, 1979; Nardi, 1982; Simon, 1983; Olsen, 1986; Sadler, 1997).

[1] According to the President's Commission on Organized Crime (Anon., 1986): "Drug-related corruption has reached the highest offices of government in the British-held Turks and Caicos Islands, where in March 1985, that country's Chief Minister, Norman Saunders, was convicted of conspiracy to travel in furtherance of a drug plot and on five counts of traveling in furtherance of in illicit drug transaction. Saunders, the first foreign head of state to be convicted on drug charges, was found not guilty of more serious charges of conspiracy to smuggle marijuana and cocaine. Trial witnesses testified that Saunders accepted a total of $50,000 to allow drugs to move freely through his island chain. He planned to use the islands as a "safe-haven" for traffickers smuggling illicit drugs from Colombia to the United States." Britain temporarily dissolved the TCI government in 1986 as a result of the scandal. After serving prison time in Miami, Saunders returned to the TCI and now serves as an elected representative of the Legislative Council (the TCI Government) from South Caicos.

Driving Forces in TCI Fisheries

The introduction of snorkeling gear and freezing technology led to the development of the modern lobster fishery in the TCI in the 1950s and 1960s. The renewal of the conch fishery in the 1970s was driven by demand-side factors, as new export markets opened in Florida. More recently, tourist arrivals in the TCI have increased sharply (Figure 2). This has led, in turn, to an influx of permanent residents (Figure 3), as expatriate business owners and retirees settle in the islands. In addition, tourism development has spurred immigration from poorer neighboring countries (primarily Haiti and the Dominican Republic) as people seek service and construction jobs.

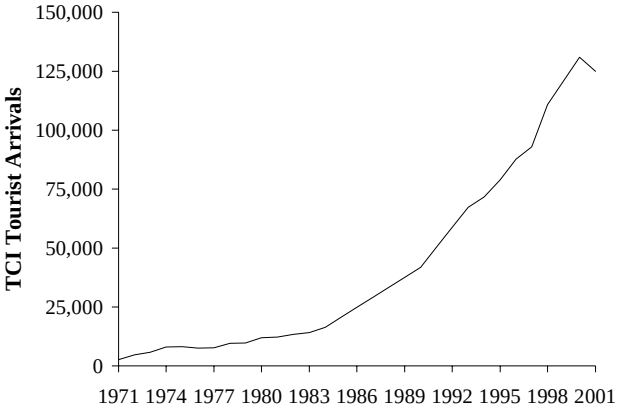

Figure 2: Turks and Caicos Islands tourist arrivals, 1971-2001 (source: TCI Tourism Board, 2001 estimated)

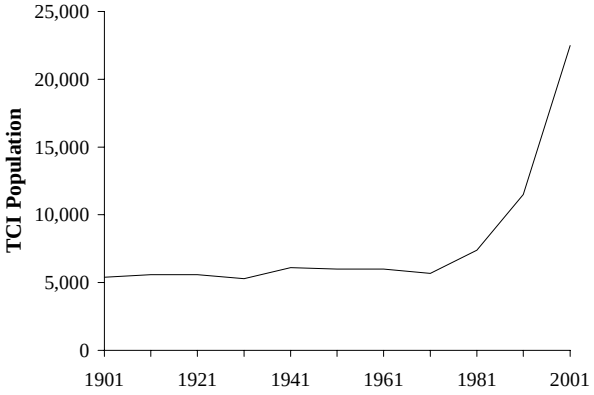

Figure 3: Estimated population of the Turks and Caicos Islands, 1901-2001.

Fisheries Landings

Queen Conch

In the TCI, dried conch have been traded with Haitians since the mid-1800s, when conch were bartered for fruit, sugar cane, vegetables and rum, as there is very little farm production on the dry, barren limestone islands of the TCI (Sadler, 1997). Doran (1958) documented trading records going back to 1904, and other records have been found going back to 1888 (Raven, 1994).

Wooden sailing sloops would act as collecting platforms for 2-man teams in 3 or 4 small wooden tenders (Doran, 1958). Conch were taken using waterglasses and a long conch rake. After cleaning ('knocking'), conch meat was dried for several days. Weekly expeditions took 75,000 to 125,000 conch per sloop, and each sloop made two or three such trips a year. As late as 1960, there were 60 sloops in operation, fishing from South Caicos to the outer conch grounds near Ambergris Cay (Raven, 1994). Conch hooks remained in use until the mid-1970s, but by the 1980s most conch fishing was conducted by free divers operating from fiberglass boats equipped with outboard engines (Nardi, 1982). The traditional East Harbor (Cockburn Harbor) grounds on South Caicos were closed to commercial fishing in 1993. The East Harbor Lobster and Conch Reserve was implemented in 1993 and currently provides protection for an important conch juvenile nursery ground (Danylchuk *et al.*, 2003).

Figure 4 shows total estimated conch production in the TCI for the period 1905-2001. Domestic consumption of conch (round weight in kg) was estimated using TCI population statistics and per capita consumption rates. Olsen (1986) estimated a per capita consumption rate of 35 kg·person^{-1}·year^{-1} in the early 1980s, based in part, on the fact that there is virtually no agriculture in the TCI. In Figure 4, I assume that historical per capita conch consumption is lower, at 20 kg person^{-1} year^{-1}, peaking at 30 kg·person^{-1}·year^{-1} during war years, because salt cod was readily available most of the first half of the 20th century[2]. I assume consumption stayed at 20 kg·person^{-1}·year^{-1} in the 1950s and 1960s, fell to 10 kg·person^{-1}·year^{-1} from the 1970s to 1990s, and has since fallen further to

[2] Salt production for the Maritime/New England fisheries was the major industry in the TCI for two centuries (see Sadler, 1997). Ships from Canada and the USA brought salt cod to TCI and Bahamas when they came to load salt. During the war years, market demand for salt fell dramatically, putting many islanders out of work. Without employment, there was a surge in artisanal commercial fishing and, hence, spikes in conch catch. I assumed that subsistence consumption rose as well as exports to other Caribbean nations.

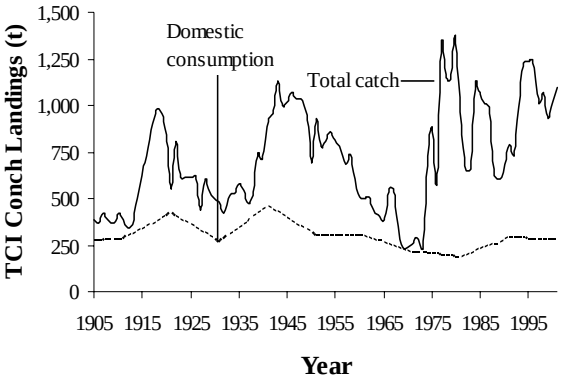

Figure 4: Total conch landings of the Turks and Caicos Islands, 1905-2001.

5 kg·person^{-1}·year^{-1}. This decline is due to an influx of immigrants who do not eat much conch, the number of alternative imported foods available, and the demand (and cash payment) for export conch by the processing plants. A restaurant survey (Rudd, in press a; Table 1) estimated total TCI restaurant consumption to be about 160 t; total domestic consumption is estimated at 280 t.

Commercial conch landing data were derived from a number of sources (Olsen, 1986; Medley and Ninnes, 1994, 1997, 1999; Raven, 1994; DECR unpublished data). Raven (1994) found that annual landing data from a variety of sources often conflicted. Landing slips are often not properly filled out in the TCI, and commercial landing data are suspect, especially prior to the 1980s.

CPUE data for the conch fishery are available from 1975 (Figure 5), but early data are of questionable quality. There have been no discernable trends in landing size. Conch abundance has declined substantially close to the South Caicos harbor over time: Doran (1958) reported that a crew of two could land 1,000 conch per day in areas near South Caicos in the 1950s.

The USA is the main market for TCI conch. One way to verify the accuracy of TCI landing data is to compare them with USA imports, as USA Census Bureau data are usually quite accurate (www.st.nmfs.gov.st1). Figure 6 compares TCI conch landings and USA imports for the years 1977 to 2001.

TCI reported landings were consistently lower than USA imports for the 1983-1989 period, indicating that TCI records under-estimated the volume of conch caught in the TCI. Since 1993, TCI landings and USA imports have corresponded quite closely: USA imports are therefore a useful proxy for current TCI landings. Note that queen conch is listed as a CITES Appendix 2 species. Under current management, a round weight TAC of 725 t (1.6 x 10^6 lbs round = 600,000 lbs meat) is set based on MSY (Ninnes and Medley, 1995) but does not take account of domestic landings.

TCI is a major conch producer and accounts for a substantial proportion of USA imports in recent years (Figure 7). The price difference between TCI conch (traditionally sold at a premium) and other producers has narrowed recently (Figure 8). Monthly USA imports show that imports from the TCI are highly seasonal (Figure 9), with peaks between April and July, the off-season for the TCI lobster fishery (see also Béné and Tewfik, 2001). Figure 10 shows that there has been substantial monthly price volatility. Nominal conch import prices have increased little since the late-1980s; when accounting for inflation, real prices over the past 20 years have fallen.

Spiny Lobster

Spiny lobster was harvested early in the 20th century by women during nocturnal 'torch walks' to attract lobster in shallow, accessible waters (Raven, 1994). Lobsters were canned starting in the early 1930s and were rapidly depleted in accessible areas as fishers began using boats, waterglasses, and barbed poles or nets on poles ('bullying').

Free diving became more prevalent in the 1950s after the introduction of masks, snorkels and fins (Raven, 1994). Lobsters were captured by hooking (hook on a flexible pole) or using the 'toss', a flexible spring noose on a stick. By the late 1960s, two man crews were landing up to 1,000 lobster per day using the toss.

In 1958, lobster traps were introduced by Jamaicans (Raven, 1994). Lobster fishing remained an uncommon occupation in South Caicos during the 1950s and early 1960s as the salt industry still employed most local workers; only six lobster divers were operating as late as 1966, as salt production ended. Larger trap boats entered the fishery in 1972. Due to low capital costs (divers initially worked from canoes), free diving became the most prevalent method and trapping has usually only accounted for 5-10% of lobster landings (Medley and Ninnes, 1997).

Table 1: Estimated annual restaurant consumption of locally landed seafood in the Turks and Caicos Islands. Processing yield of 40% for conch and 34% for lobster. Local reef fishes are sold whole to restaurants. 'Tourist' restaurant consumption is based on weekly consumption and an estimated 90% survey coverage for tourist restaurants in the TCI. 'Native' restaurant consumption is approximately equal in volume to tourist restaurant consumption. Note that 30.3 tonnes of native restaurant consumption of other fish is locally landed 'small fish' and was estimated as equaling tourist restaurant consumption of pelagics.

Species	Restaurant purchases (kg week^{-1})	Locally landed (%)	Consumption (t·year^{-1})			Meat yield (%)	Total round weight consumption (tonnes year^{-1})
			Tourist restaurant	Native restaurant	Total dressed weight		
Grouper (Nassau)	725	60	25.0	25.1	50.3	100	50.3
Lobster	650	90	33.8	33.8	67.6	34	187.8
Conch	550	100	31.8	31.8	63.6	40	158.9
Snapper	440	50	12.7	12.7	25.4	100	25.4
Mahi Mahi	400	100	23.1	-	23.1	100	23.1
Wahoo	125	100	7.2	-	7.2	100	7.2
Others	265	0	-	30.3	30.3	100	30.3
Total	**3,155**	**-**	**133.8**	**133.8**	**267.5**	**-**	**483.0**

Fiberglass boats and outboard engines (2.5 to 6 hp) were first used for lobster fishing in 1952. As engine horsepower increased over time (for fishing and/or smuggling in the 1980s), distant parts of the Caicos Bank were opened for fishing. By 1983 all areas of the Bank had been exploited by fiberglass runabouts with 55 to 70 hp outboards. As late as the 1960s, productive grounds close to South Caicos (The Bank, Six Hills, South Caicos) still yielded large lobster (Raven, 1994). By the mid 1970s, fishers complained that these areas had only barely legal and sublegal lobster. Deeper water grounds (The Lake, South of Ambergris Cay, Seal Cays, Bush Cay, White Cay, East Side, North Side of East Caicos, Phillips Reef – see Rudd *et al.*, 2001) were progressively depleted as lobster fishers ventured farther afield and into deeper waters.

Despite a hook ban until the late 1970s, it was – and remains, despite periodic bans – the lobster fishing tool of choice. The use of bleach and detergent (to flush lobsters out of dens) has also become widespread despite the damage it causes to coral habitats, possibly leading to increases in macroalgal coverage on coral reefs in heavily fished areas (Tupper and Rudd, 2002).

Divers from Provo have always fished conservatively in relatively shallow waters compared to fishers from South Caicos (Raven, 1994). When lobster inhabiting shallow water (<13 m) became scarce, Provo divers tend to switch to conch (or more recently, finfish) while South Caicos lobster divers have tended to go farther afield and dive deeper for lobster.

The lobster fishery is regulated using minimum size limits (3.25 inches carapace), a closed season (April 1 to July 31) and prohibitions on the use of scuba (high compliance) and noxious chemicals (low compliance). Capture of mature females is prohibited, but compliance is relatively low and there has been a major problem with minimum size limit compliance in the TCI. The beginning of the lobster season is known locally as the 'Big Grab'. As many as 95% of lobsters landed from some accessible fishing grounds fall below the legal minimum size (Rudd *et al.*, 2001).

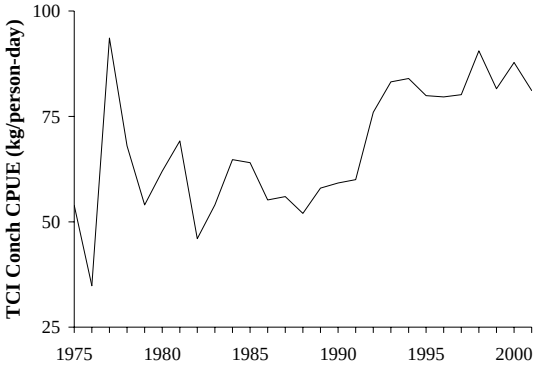

Figure 5: Relative abundance of Queen conch 1975-2001.

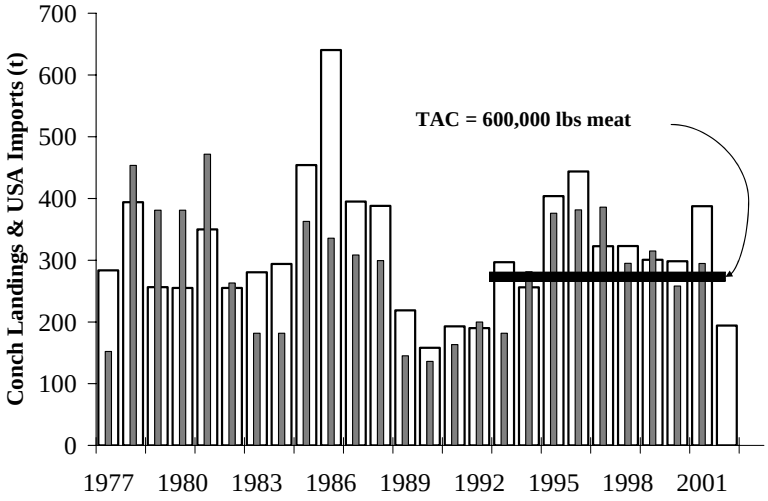

Figure 6: USA conch imports (open columns) versus TCI conch landings (grey columns) 1977-2001 (fishing year, 01 August to 31 July). TCI landings converted to meat equivalent using 40% meat yield.

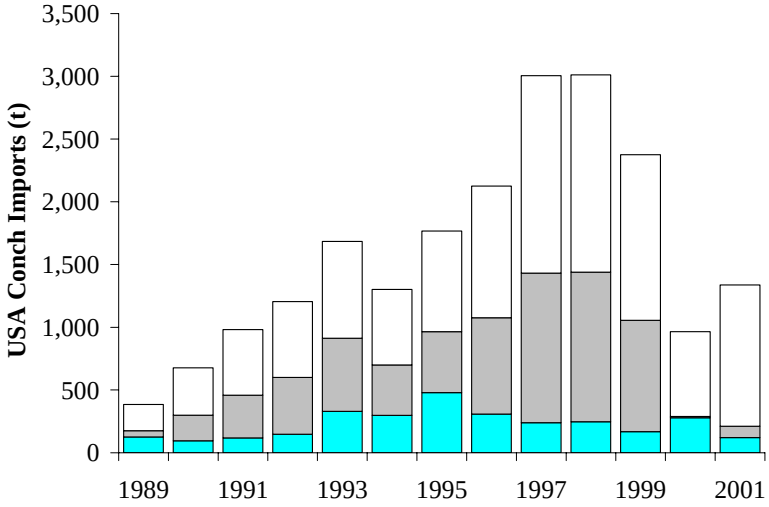

Figure 7: USA conch imports by origin (TCI, bottom; Jamaica, middle; other, top), 1989-2001 (calendar year)

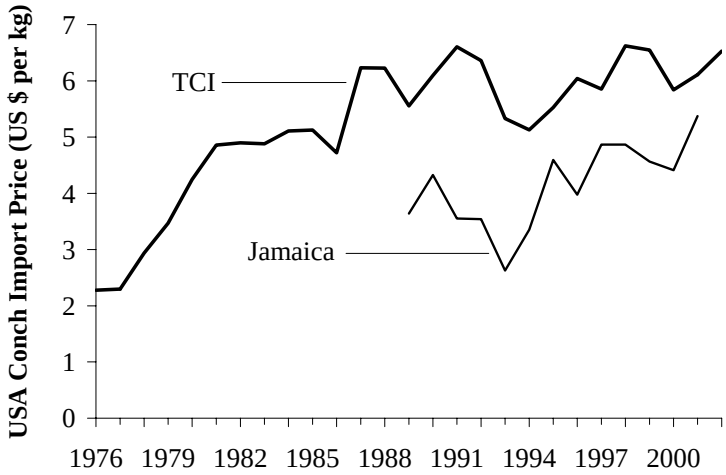

Figure 8: USA mean annual conch import prices by origin, 1976-2001.

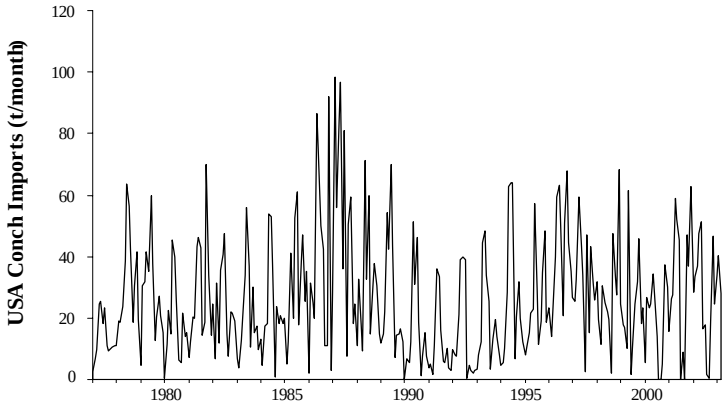

Figure 9: USA monthly TCI conch import volume, 1976-2001.

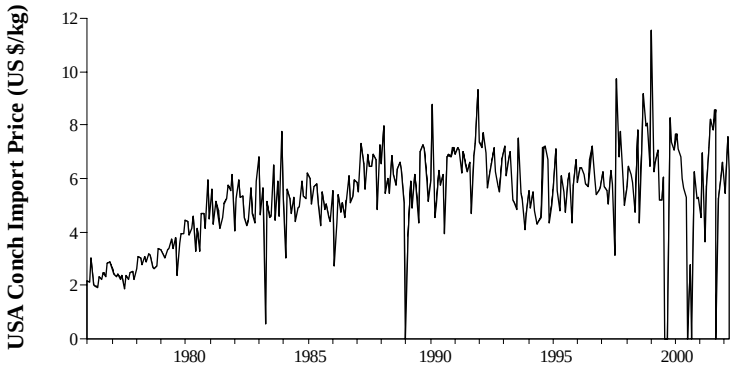

Figure 10: USA monthly TCI conch import prices, 1976-2001

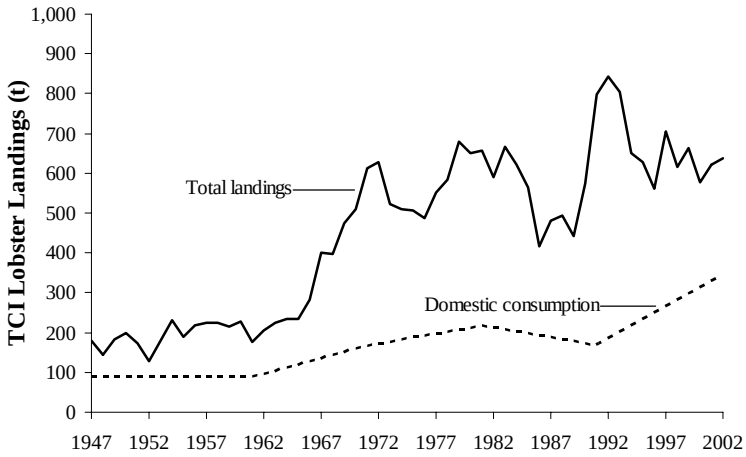

Figure 11: Total spiny lobster landings and domestic consumption in the Turks and Caicos Islands, 1947-2002 (based on fishing season, 01 August to 31 July).

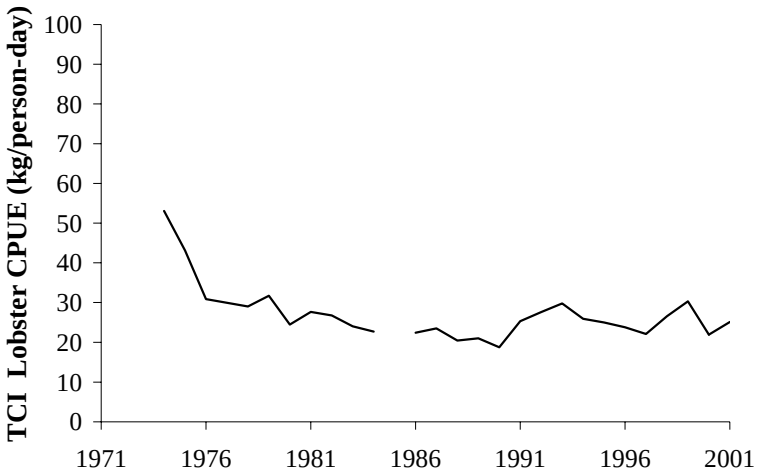

Figure 12: Spiny lobster CPUE (kg per person-day), 1971-2001.

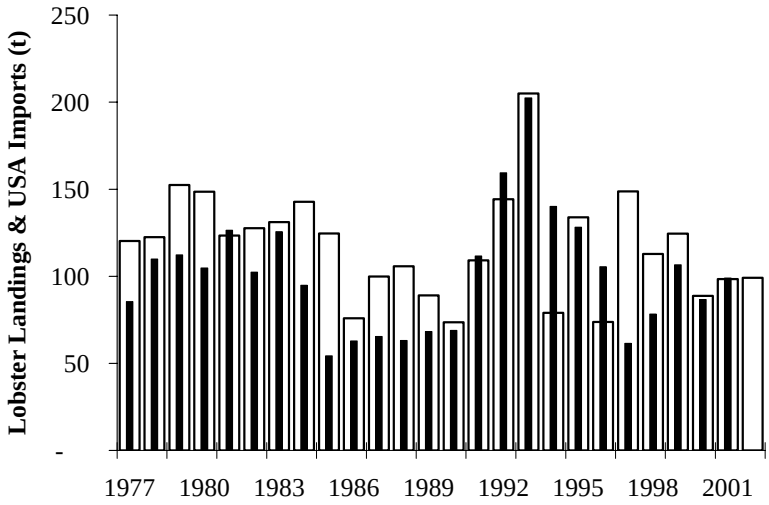

Figure 13: USA imports (open columns) versus TCI landings (black columns, converted from round weight to dressed weight at 34% recovery). Imports and landings are for 01 August to 31 July fishing year.

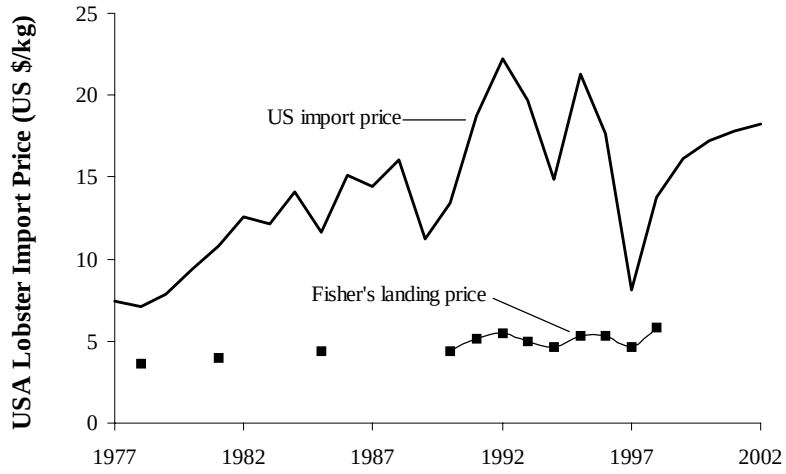

Figure 14: USA mean annual import price and TCI fisher landing price (US $ kg^{-1}) for TCI spiny lobster, 1977-2001.

Production statistics from DECR were available until the 2000-2001 fishing season (01 August 2000 to 31 July 2001). USA import data are available since 1977 and appear to be a reasonable proxy for TCI landings in recent years (see below). Lobster landings were therefore calculated as the maximum of DECR production figures or USA imports, converted to round weight equivalent at 34% recovery. Domestic consumption was estimated using per capita consumption of 5 kg·person^{-1}·year^{-1} for the periods 1948 to 1971, and 1991 to 2002. Per capita consumption of 10 kg·person^{-1}·year^{-1} was used for the period 1971 to 1991 as reliance on local food products was likely higher at that time than earlier (when local fishing activity was minimal) or later (when more imported food was available).

The restaurant survey conducted in 2000 (Rudd, in press a; Table 1) estimated restaurant consumption of 188 tonnes year^{-1} in the TCI. Total domestic consumption for 2000 is estimated at 331 tonnes based on per capita consumption. This seems to be reasonable, as many people in the TCI buy lobster directly from fishers and store them in home freezers for consumption throughout the year. Total estimated spiny lobster production is shown in Figure 11.

Raven (1994) reported anecdotal information that mean lobster size in the range of 3 kg had been reported by the early trap fishers. Since the 1970s, average sizes remained quite constant around 0.7 kg. After starting at high levels in the early 1970s, CPUE has fallen and leveled off in the 20 to 30 kg·person^{-1}·day^{-1} range (Figure 12). Early CPUE data is likely not very reliable.

Figure 13 compares USA spiny lobster imports from the TCI (converted to round weight using 34% meat recovery rate) with TCI production. Between 1974 and 1980, some whole cooked and live lobster was exported to other eastern Caribbean nations (Raven, 1994). While some carry-over of frozen inventory is possible from year to year, it appears that DECR figures have under-estimated landings in the mid 1980s and again from 1997 to 1999 (Figure 13). Presumably this discrepancy resulted from lack of processing plant monitoring and/or plant misreporting.

TCI is only a minor lobster supplier in the USA and, unlike the situation for conch, is certainly a price taker in a world market. Figure 14 shows average USA import prices for TCI lobster and, where available, landing prices for TCI fishers (Raven, 1994; Béné and Tewfik, 2001). Lobster landings are highly seasonal, with most effort and landings occurring during the first month of the season (August). For the period 1989-1998, almost 40% of annual production was landed during the August 'Big Grab' (Béné and Tewfik, 2001). Effort and landings decrease rapidly during the autumn. This production trend is mirrored by USA imports (Figure 15).

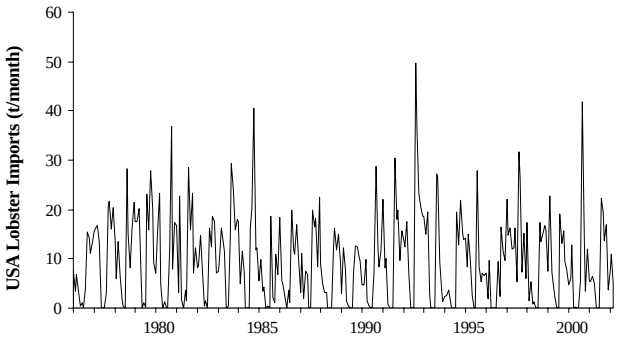

Figure 15: Monthly TCI lobster imports into USA, 1976-2001.

The Big Grab is a phenomenon driven by visiting 'Belonger' (a term referring to native islanders) fishers (Rudd *et al.*, 2001). Many Belongers take leave from other employment to travel to South Caicos for several weeks in August. All Belongers have a right to fish lobster and, although they are supposed to abide by regular fisheries rules, there are widespread violations. Visiting fishers tend to be less skilled than resident fishers (many cannot free dive more than 10 m). As a result, they tend to target shallow areas, intercepting young lobsters migrating from the shallow Caicos Bank to deeper fringing reefs. The result is severe growth overfishing as well as indirect effects on the conch fishery (i.e., causing fulltime fishers to shift effort to conch sooner than would be normal) (Béné and Tewfik, 2001). Processing plants are complicit in the illegal harvest, as they regularly receive and process undersize lobster tails as 'head meat' (pers. obs.). Other undersize lobster is used locally in native restaurants or sold to individuals.

Lobster prices in the USA have been quite volatile over the past 25-years (Figure 16). In general, price volatility in the USA market is related to international supply and demand

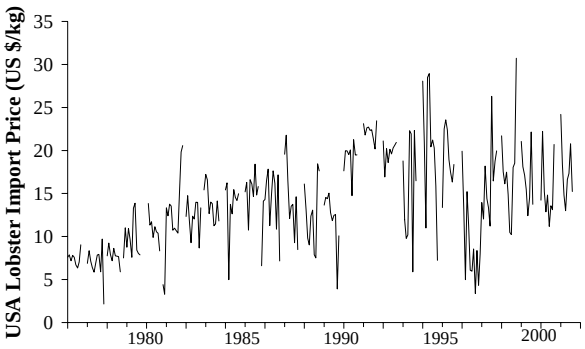

Figure 16: Monthly TCI lobster import prices into USA, 1976-2001

factors. Low prices for TCI lobster in August and September probably relate, at least in part, to strategic pricing by USA importers, who realize that TCI processing plants have limited cold storage and must sell lobster quickly. No formal price determination research has been conducted for TCI lobster to date. Recent research (Rudd, 2001) has shown that spiny lobster has non-extractive economic value, increasing divers' willingness to pay for dive charters in which lobster are observed.

Finfish

The production and use of finfish in the TCI is poorly documented. It is likely, however, that some species of fish have been important for subsistence purposes back through the 20th century and before. There are three types of finfish resource that have been exploited in the TCI at different times: demersal reef fishes (e.g., groupers, snappers, grunts, hogfish), pelagics (e.g., mahi mahi, tuna, wahoo, swordfish) and bonefish.

Bonefish (*Albula vulpes*) and Nassau grouper (*Ephinephelus striatus*) are the historically favored species for local consumption (Olsen, 1986). Bonefish are shallow-water bottom feeders that school on the Caicos Bank. They were historically important for subsistence, but consumption has fallen in recent decades as old-time 'haulers' retire. Bonefish is also regarded as a 'poor man's' food to some extent and is not as popular with islanders as it was historically. Bonefish is a highly regarded sport fish and several companies now offer catch-and-release fishing charters on the flats of the Caicos Bank.

Reef fishes are primarily caught as bycatch of commercial lobster fishing. Nassau grouper is the preferred species, due to size and flesh quality, but a number of other fishes are taken opportunistically. Nassau groupers are often speared by lobster fishers as they follow close to free divers, waiting for opportunities to snatch lobsters (Tony Morris, personal communication, South Caicos, 2000). Sometimes, lobster boats will take a day to target reef fishes exclusively. In dockside samples, Tupper and Rudd (2002) found CPUE for reef fish was 3.2 kg·hour^{-1} for the 456 hours fishing effort (i.e., lobster was primary target) in regularly fished grounds. In lightly fished lobster grounds, reef fish CPUE rose to 17.8 kg·hour^{-1}.

Anecdotal evidence suggests that a large multi-species spawning event occurs annually off East Caicos (location details withheld). Dive charter operators have also reported seeing spawning aggregations (Rudd and Tupper, 2002). The aggregations do not appear to be regularly targeted by artisanal fishers, although some have been targeted specifically in the past.

Reef fish fishing is essentially open access in the TCI. There is a prohibition on the use of scuba gear, but there are no size limits, seasonal closures or TAC. A small marine reserve near South Caicos provides some protection for smaller hogfish (*Lachnolaimus maximus*) and white margate (*Haemulon album*), but there are no differences in density inside and outside the reserve for the larger Nassau grouper (Tupper and Rudd, 2002). While finfish densities are high in the TCI relative to other countries in the region, the historic focus on Nassau grouper has almost certainly reduced their abundance substantially from pristine conditions. Nassau grouper is a high-profile species in the dive tourism industry and divers in the TCI are willing to pay more for dive packages on which they observe more and/or larger fish (Rudd and Tupper, 2002). Lack of effective management of fisheries may thus impose significant economic externalities on the dive tourism industry.

Pelagic fishes (e.g., tuna, wahoo, swordfish, mahi mahi, marlin) have rarely been targeted in the TCI. A Japanese company leased 24 Taiwanese vessels and was granted licenses to fish in the TCI from 1980 to 1992 (Halls *et al.*, 1999). The vessels used longlines, targeting swordfish and tuna (and some red snapper) near the Gentry Banks. The licenses were not renewed after 1992 due to fears that fishing

would adversely impact the sport fishery. Small amounts of pelagics are landed by sport charter boats from Provo and sold to local restaurants (Rudd, in press a). It is estimated that about 30 tonnes·year^{-1} are consumed locally, all in tourist-oriented restaurants. The mortality rates for catch-and-release fish in the sport fishery are unknown.

Total finfish production is shown in Figure 17. I assume the domestic per capita finfish consumption was 20 kg·person^{-1}·year^{-1} from the 1951 to 1981 and then decreased to 15 kg·person^{-1}·year^{-1}. This is substantially below the estimate of 35 kg·person^{-1}·year^{-1} by Olsen (1986). Total restaurant consumption of all finfish in 2000 was about 135 tonnes. Using per capita consumption of 15 kg, this translates to landings of about 360 t. The difference between these figures is substantial, indicating the per capita estimate may be somewhat high or, alternatively, suggesting that native restaurant consumption may be under-estimated.

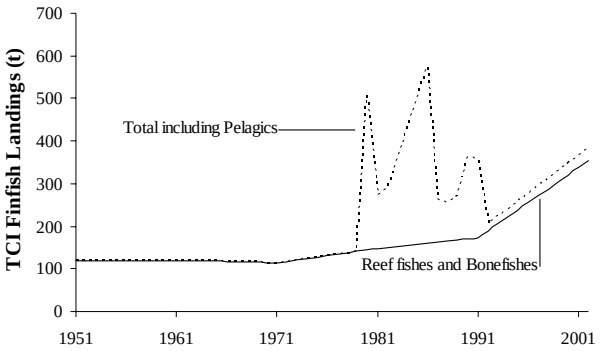

Figure 17: Finfish landings for Turks and Caicos Islands from 1951-2001.

Other Species

Sponges were exported starting in 1841 when Bahamian operations spread to the Caicos Bank. Sponge exports peaked at 9,277 pounds sterling in 1901 (Raven, 1994). At its peak in the early 1900s, three bases were operating on South Caicos, Dellis Cay and Five Cays (Sadler, 1997), and employed about one third of the local work force. Sponges were harvested using waterglasses and iron hooks by up to 50 sailing sloops that had crews of 3-9 men each working out of dinghies. 'Wool' sponges were initially targeted, but were depleted rapidly as operations grew on South Caicos. Culture experiments were initiated in the early 1900s, but sponge blight and a move to plastic sponges in the market killed the industry by 1940. Occasionally, small-scale exports do take place these days.

Turtle shell was exported to England from 1887 to the early 1900s with a peak export value of 1,706 pounds sterling in 1906 (Raven, 1994). Poaching by foreigners became such a problem that the government of the TCI implemented a Turtle Protection Ordinance. By 1909, the Caicos Development Company leased Chalk Sound on Providenciales for raising and canning turtles. After the person exporting turtles died in 1915, trade slowed greatly. Sea turtle is still consumed locally, although there is no information about catch levels. However, it is likely in the hundreds per year.

Between 1845 and 1859 there was a brief, but important, sperm whale fishery based on Salt Cay (Sadler, 1997). Whales were taken from Silver Bank (Dominican Republic), so presumably some whales would have also been taken on nearby Mouchoir Bank.

CONCLUSIONS

Based on current estimates, total seafood landings in the TCI is just reaching the 1,000 tonne·year^{-1} mark (Figure 18). While conch landings have remained relatively steady, there have been increases in lobster and finfish landings to satisfy growing local demand by hotels and restaurants that cater to tourists.

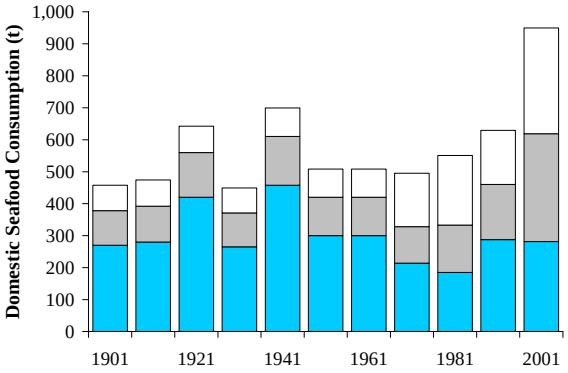

Figure 18: Total seafood production from TCI (excl. pelagic fishes).

Although data for the TCI goes back in time farther than most other countries in the region, data quality is poor, especially prior to the late 1970s. Estimates of current consumption should be viewed with caution. There are many landing sites in the TCI (Halls *et al.*, 1999), and a comprehensive seafood consumption survey would be the only way to accurately assess domestic seafood consumption.

The recent congruence between USA import and TCI production figures is promising. The USA statistics are available online from the U.S. National Marine Fisheries Service with a delay of only about three months. This should allow accurate monitoring of TCI conch and lobster landings. When products are misclassified, it is relatively easy to sort out proper classifications in USA imports because TCI ships such a limited variety of products.

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