

# FINAL REPORT

## Assessment of IUU (Illegal, Unreported and Unregulated) Fishing in the Bahamian Spiny Lobster Fishery

REVISED 18 MAY 2011

### TABLE OF CONTENTS

1. EXECUTIVE SUMMARY	2
2. INTRODUCTION AND DEFINITIONS	3
3. RESTAURANT AND RESORT SURVEYS	9
4. RESIDENT SURVEYS	12
5. COMMERCIAL FISHER INTERVIEWS AND ILLEGAL FISHING	15
6. THREATS ASSESSMENT OF IUU FISHING RISKS AND RECOMMENDATIONS	25
7. REFERENCES	27
8. APPENDICES	31

APPENDIX 1: Conversion of weight to number of lobsters extracted.

APPENDIX 2: Restaurant Database for targeted resorts, clubs and restaurants

APPENDIX 3: Photo Log

APPENDIX 4: Survey used for Restaurant database

APPENDIX 5: Results from Resident and Recreational Fishers Survey

APPENDIX 6: Commercial Fishery Assessment – Supporting Information



Kathleen Sullivan Sealey  
Department of Biology University of Miami  
Coral Gables, FL USA

UNIVERSITY  
OF MIAMI



## 1. EXECUTIVE SUMMARY

This report is not exhaustive, but aims to highlight the most important areas of IUU fishing in the Bahamian lobster fishery that require attention to move the MSC certification process forward. The goal was to provide an assessment particularly for illegal and unreported spiny lobster fishing in national waters. The “benchmark” used in this assessment was the known export of 5.2 million pounds of lobster tails (this translates into 12.5 million individual lobsters). These 5.2 million pounds of exported lobster is based on a four-year average from 2005-2008, provided by the Department of Marine Resource Management, Government of The Bahamas<sup>1</sup>. The value of the Bahamian lobster fishery can be estimated at near \$100 million dollars in terms of export, employment and in-country tourism<sup>2</sup>. **Table 1** provides a summary of the current exports of lobsters and estimated IUU fishing from in-country recreational fishers, commercial fishers, and foreign fishing vessels operating in The Bahamas to determine the total biomass of lobsters taken from Bahamian waters.

Illegal and unreported catches are the current uncertainties in the Bahamian lobster fishery. To date, little or no information is available on the scale and intensity of illegal fishing or for legal, non-commercial fishing. “Illegal” fishing is the taking of lobster by any means that is in violation of the existing laws and regulations. “Unreported” fishing includes fishers whose activity and information is not available to the relevant national authority or regional organisation. The organization of this report focuses on three stakeholder groups: 1) restaurants, resorts and resident consumers of lobsters, 2) recreational lobster fishers (residents and visitors), and 3) commercial fishers primarily selling lobsters to licensed processors. The surveys of restaurants and resorts revealed that most large restaurants serve legal sized lobster from known wholesalers, and overall, the potential risk for undersized lobster to be consumed in the restaurant industry is only 5% of the current export quantities.

Interviews throughout the Bahamas of recreational fishers and tourists revealed a much larger potential for illegal landings. The growing population and increased yachting and overnight tourism on the Out Islands of The Bahamas create the potential for increased IUU fishing, and should be more closely monitored. Residents admit to a low level of regulatory compliance when fishing small amounts of lobsters for local consumption or sale. However, the population of The Bahamas is only 326,000 people (2010 Department of Statistics, Government of The Bahamas), thus the larger illegal conduit for seafood consumption lies to the south on the populous and hungry island of Hispaniola.

Interviews with commercial fishers within The Bahamas indicated increased compliance with landing only legal sized lobster within the open season because of the difficulty of selling quantities of undersized or out of season lobsters. The requirements and regulations on the export market to the USA, Canada or to Europe have greatly reduced the possible market opportunities for illegal lobster; the ban on export of lobster meat, as well as implementation of the Magnuson-Stevens Act in the USA has virtually closed markets for undersized lobsters.

It is likely that the greatest number of lobsters caught and removed from the ecosystem is through illegal foreign fishing in Bahamian waters, primarily by large, well equipped Dominican vessels. Interviews with commercial fishers and analysis of the spiny lobster market in the Dominican Republic indicate a large domestic market with a knowledgeable fishing fleet easily accessing to Bahamian waters. The rationale used in constructing estimated catches from each stakeholder group is provided to summarize the potential threats to the Bahamian lobster fishery from IUU fishing.

---

<sup>1</sup> Mr. Michael Braynen, Director of Fisheries, Annual Report 2009 Department of Marine Resources.

<sup>2</sup> Based on Department of Marine Resource Annual Report, 2009, using a four year average for the fishery

**TABLE 1: ESTIMATED TOTAL BIOMASS AND NUMBERS OF SPINY LOBSTERS REMOVED FROM BAHAMIAN WATERS BASED ON LEGAL AND IUU FISHING<sup>3</sup>**

FISHERY COMPONENT	NUMBERS OF LOBSTERS	NUMBER OF POUNDS	PERCENT OF TOTAL SPINY LOBSTER LANDINGS
<b>KNOWN EXPORTS</b> – with documentation from Bahamas Marine Exporters Association (BMEA) members, assumption of no IUU catch in these exports. <sup>4</sup>	12,500,000	5,200,000	<b>63.99%</b>
<b>ILLEGAL FOREIGN FISHING</b> (Dominican Republic vessels, 2009-2010 landing estimate)	4,326,840	1,799,965	<b>22.15%</b>
<b>RECREATIONAL</b> (unreported and/or illegal)	2,138,741	889,716	<b>10.95%</b>
<b>RESTAURANTS</b> (illegal or unaccounted sources)	570,000	237,120	<b>2.92%</b>

The archipelago nature of The Bahamas makes the country very susceptible to illegal fishing activities across the large bank areas; the resources for effective monitoring and enforcement are not in place. With lobster being the highest value seafood export from the entire Caribbean region, the trend for the next ten years would be increased pressure on the Bahamian lobster stocks, and increasing competition between legal and illegal fishers.

## 2. INTRODUCTION AND DEFINITIONS

The fisheries regulations in The Bahamas are the responsibility of the Department of Marine Resources. Enforcement is carried out collaboratively with the Royal Bahamas Defense Force and the Royal Bahamas Police Force. The Department of Marine Resources maintains a website with information on current fisheries regulations at [www.Bahamas.gov/MARINE\\_RESOURCES](http://www.Bahamas.gov/MARINE_RESOURCES). In general, commercial lobster fishers are required to have a license, and abide by regulations concerning gear, closed season, and minimum size of lobsters taken. Regulations also apply to recreational fishers, both Bahamian nationals and foreign visitors. Bahamian fisheries regulations are developed in concert with regional efforts under the Caribbean Fisheries Council and other multi-lateral organizations to protect the spiny lobster fishery throughout the wider Caribbean. The Food and Agriculture Organization of the United Nations recognizes the seriousness of over-fishing on global fisheries, and have produced an implementation Plan of Action to deter IUU fishing globally; the technical guidelines provide a global overview of IUU fishing (See **Box 1**; FAO-UN, 2002).

Illegal, unregulated and unreported (IUU) catches can undermine fisheries management objectives and place the status of the stock at greater risk of over-exploitation. To date, little or no information is available on the scale and intensity of these activities. New information on total removals can be included within the stock assessment process to ensure the results are more robust. Increased education and outreach activities targeting not only the fishing communities but also the seafood consumer may also lead to reduced levels of IUU fishing. This report outlines the nature and scope of IUU fishing within the Exclusive Economic Zone (EEZ) of the Commonwealth of The Bahamas.

<sup>3</sup> Based on interviews completed and documents reviewed for this report.

<sup>4</sup> BMEA is made up of the seven largest licensed lobster exporters in The Bahamas. There are a total of 11 companies licensed to export as of April 2011. Non-BMEA members contribute less than 5% to total lobster exports.

The first task was to understand what constitutes IUU fishing. “Illegal” fishing is the taking of lobster with any means in violation of the existing laws and regulations. “Unregulated” fishing is done by vessels not party to these fishing regulations; and includes fishers who enter the fisheries not accounted for by the regulatory structure. “Unreported” fishing includes fishers whose activity and information are not available to the relevant national authority or regional organisation (Agnew et al, 2009). How do these definitions relate to the spiny lobster fisheries in The Bahamas?

**Illegal fishing** is perhaps the simplest to define (See Agnew et al. 2009) but the most difficult to document and quantify. Illegal fishing for lobsters in The Bahamas includes

- Foreign fishing vessels entering Bahamian waters and taking lobsters back to their country of origin;
- Commercial or recreational fishers taking UNDERSIZED lobsters
- Commercial or recreational fishers taking lobster OUT OF SEASON (closed season from 1 April to 30 July)
- Commercial or recreational fishers taking lobsters with RESTRICTED GEAR, such as spearing on SCUBA, or destructive fishing measures (e.g. using Bleach on the reef)
- Fishers breaking other laws in the taking of lobster such as using foreign crew without work permits

**Unregulated fishing** has a more limited application to the Bahamian lobster fishery. The major source of unregulated fishing comes from foreign boats already fishing illegally within the country; these fishers are unregulated in terms of the size of the lobster caught and the fishing methods. Unregulated fishing in this sense is thus part of the illegal fishing issue.

**Unreported fishing** includes the local or recreational fishing for lobster by Bahamians (with no catch limit) and Visiting Yachters (restricted under the sportsfishing regulations now limit each sportsfishing boat to 10 lobsters at any time). The sportsfishing regulations have attempted to address the issue of foreign nationals fishing excessively in Bahamian waters, and this regulation has been changed from the earlier limit of 6 lobsters per person per day. In areas where foreign vessels congregate (e.g. Abaco and Exuma); there are reports of yachters impacting the local lobster populations, though this effort is not reported and is unknown. Unreported fishing could be significant and represents a component of the total lobsters landed and consumed within the country.

**BOX 1: FAO Definitions of IUU fishing<sup>5</sup>.** The global definitions for IUU fishing need to be specifically defined for the laws, regulations and fishing practices in The Commonwealth of The Bahamas.

**Illegal fishing** refers to fishing activities:

- (1) conducted by national or foreign vessels in waters under the jurisdiction of a State, without the permission of that State, or in contravention of its laws and regulations;
- (2) conducted by vessels flying the flag of States that are parties to a relevant regional fisheries management organization but operate in contravention of the conservation and management measures adopted by that organization and by which the States are bound, or relevant provisions of the applicable international law; or
- (3) In violation of national laws or international obligations, including those undertaken by cooperating States to a relevant regional fisheries management organization.

**Unreported fishing** refers to fishing activities:

- (1) which have not been reported, or have been misreported, to the relevant national authority, in contravention of national laws and regulations; or
- (2) Undertaken in the area of competence of a relevant regional fisheries management organization which have not been reported or have been misreported, in contravention of the reporting procedures of that organization.

**Unregulated fishing** refers to fishing activities:

- (1) in the area of application of a relevant regional fisheries management organization that are conducted by vessels without nationality, or by those flying the flag of a State not party to that organization, or by a fishing entity, in a manner that is not consistent with or contravenes the conservation and management measures of that organization; or
- (2) in areas or for fish stocks in relation to which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law.

As these provisions reveal, "IUU fishing" is a broad term that captures a wide variety of fishing activity, most of which is illicit. Illegal fishing is, by definition, wrongful. The common thread is that IUU fishing may generally be said to occur in violation of - or at least with disregard for - applicable fisheries rules, whether adopted at the national or international level.

**Figure 1** outlines the flow of lobsters from the marine environment to the plate. There are three main areas that require some documentation:

**A. Lobsters taken by residents and tourists that are caught sold and consumed locally.** There is a small amount of lobsters exported legally under the sportsfishing regulations. Any person leaving The Bahamas (other than as mentioned above for foreign vessels), Bahamian or visitor, is allowed to take 10 pounds of lobster out of The Bahamas as a part of their personal baggage<sup>6</sup>. as per sportsfishing regulations for foreign vessels (see **Box 2** for details). In addition, Bahamians can take lobsters to friends and family when they travel, though these shipments are subject to U.S. Department of Agriculture inspection at the point of entry. These lobsters are declared as gifts, not for resale, and are most often carried a luggage on an airlines, limiting the amounts to less than 50 pounds.

**B. Lobsters purchased by processors that are primarily packaged for export,** with a small amount held for commercial sales within the country. This is the largest proportion of the known catch based on current documentation.

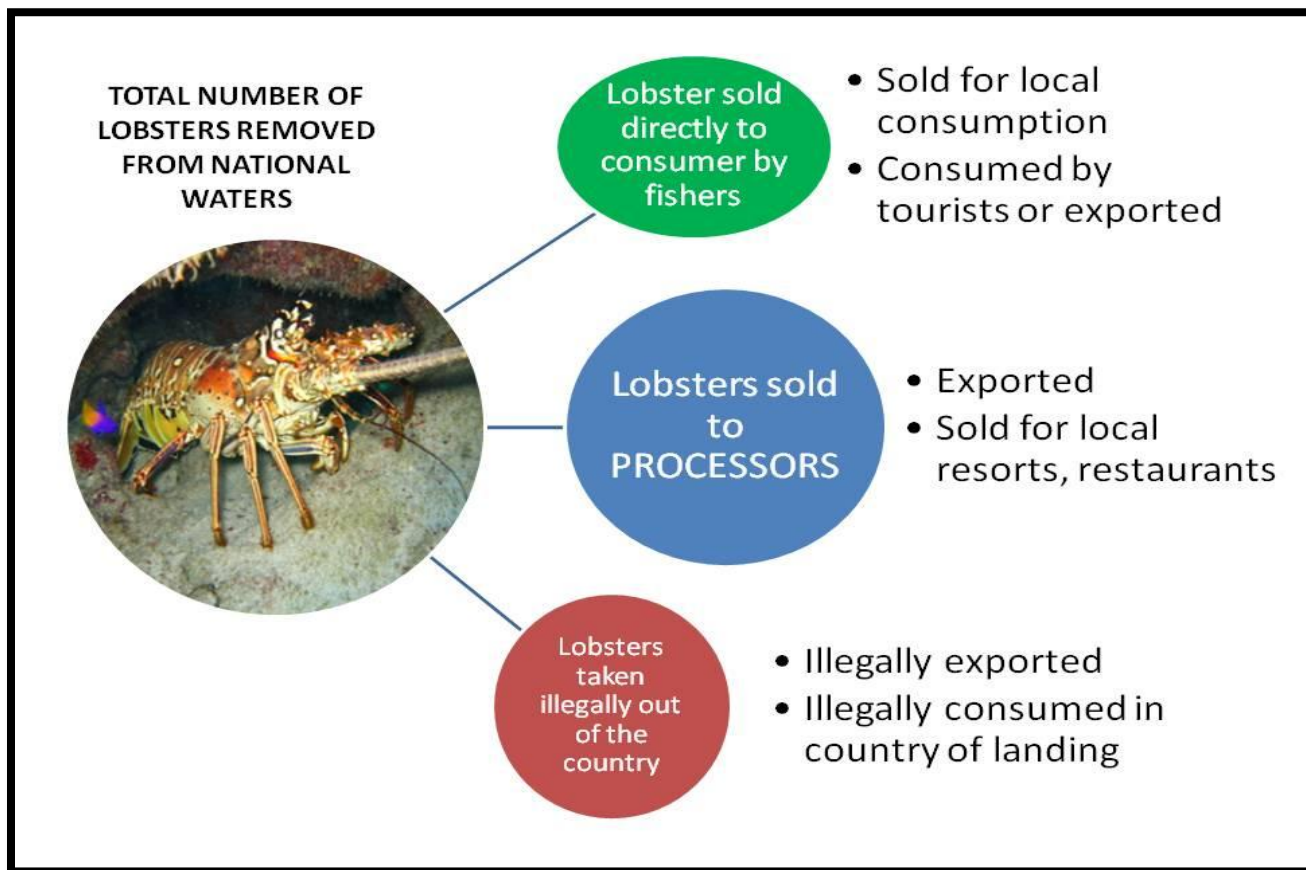
**C. Lobsters caught and taken out of the country illegally by foreign fishing vessels.** Although there are many complaints about lobster poaching by foreign fishing vessels, and some arrests, this is the largest undocumented component of the fishery catch.

<sup>5</sup> From <http://www.fao.org/DOCREP/005/Y3536E/y3536e04.htm>

<sup>6</sup> Fisheries Regulation 70 (2)(1) as outlined by DMR Director Mr. Michael Braynen

**BOX 2: Commonwealth of The Bahamas SPORTSFISHING REGULATIONS<sup>7</sup>** was developed to allow tourists to enjoy recreational fishing, but prevent the harvest of fish for sale or consumption after leaving Bahamian waters. A permit is required for foreign vessels to engage in sportsfishing. Under such a permit, the following rules apply:

- 1.) Fishing gear, unless otherwise authorized, shall be restricted to hook and line. The number of lines in the water at any time, unless otherwise authorized, shall be restricted to 6. While more than 6 lines can be on the vessel, no more than 6 can be in the water at the same time.
- 2.) Sports fishermen are allowed to keep this amount of fishery products legally aboard the vessel. The new bag limits are:
  - 18 pelagic fish (any combination of dolphin, wahoo, kingfish or tuna),
  - 10 lobsters, when in season (1 Aug - 31 March of the following year) and of appropriate size (minimum 5.5 inch tail length),
  - 6 conch, the shell lip of which should be well developed and flared,
  - 60 pounds or up to 20 demersal fish such as snappers and groupers, whichever is the lesser.
- 3.) The above amounts are also what foreign vessels are allowed to take when leaving Bahamian waters.
- 4.) No vessel shall have on board any fish unless the head and tail are intact and unskinned.



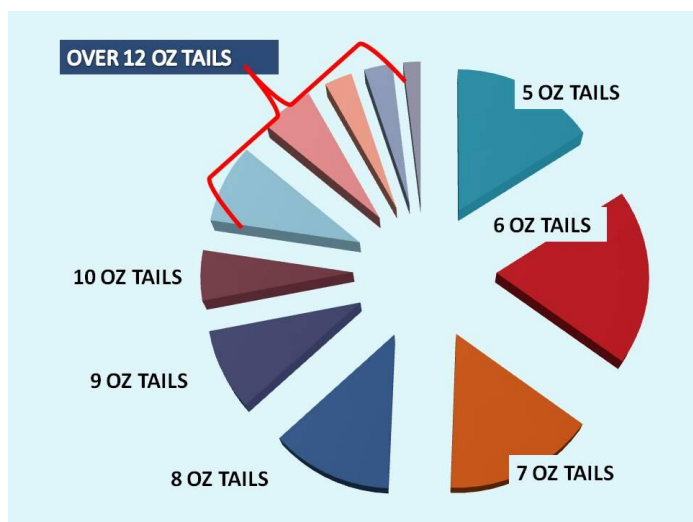
**FIGURE 1: The goal of sustainable fisheries management is to document the total number and biomass of lobsters taken out of Bahamian waters. The stock assessment depends on an accurate assessment of the total catch.**

<sup>7</sup> From

<http://www.bahamas.gov.bs/bahamasweb2/home.nsf/vContentW/b01e9020fe5c0578852576b200608e36!OpenDocument&ExpandSection=4.2,2#Section4.2>

With the increasing regulatory environment for seafood export, the documentation from processors was the easiest component to quantify. Over the past five years, processors have documented a marked decrease in the landings of undersized lobsters with the implementation in the USA of the Magnuson-Stevens Act. Lobster meat can no longer be exported from the country, thus there are virtually no markets for undersized lobster. With the formation of BMEA (Bahamas Marine Exporters Association) in 2010, there is strong interest among processors to comply with international fisheries regulations and export requirements. Because exports are taxed, all parties are motivated to produce reliable documentation of the number and amounts of lobsters taken by processors. Processors are required to provide detailed information on the source of lobsters, as well as size distribution of tails sold (**Figure 2**).

The fishing and seafood processing industry of The Bahamas depends on the export demand for Bahamian lobster tails. The lobster or crawfish fishery is the most important marine resource in the Bahamas with 5.2 million pounds of lobster tails (four-year average) valued at about \$87.5 million annually. In addition, the lobster fishery provides jobs, economic diversity and an important source of income from the tourist industry (to consume a lobster meal). Based on the size distribution of tails from exports, the 5.2 million pounds translates into some 12.5 million lobsters removed from the ecosystem from known records. The challenge is to understand what this number means in terms of some unknown total number of lobsters taken by all sources from Bahamian waters.



**FIGURE 2: Distribution of the size of lobster tails based on 2009 Tropic Seafood and J&J Heritage Seafood records of sales and exports.** 63.3% of all lobsters processed were 5, 6, 7 or 8 ounce tails. Based on tail sizes, the average export of 5.2 million pounds of exported lobster translate into 12.5 million lobsters removed from Bahamian reefs.

See **Appendix 1** for the conversion factors and equations to convert from pounds of lobsters processed to number of individuals removed from the ecosystem.

Using the documentation of lobsters commercially processed and exported as the known benchmark, this report identifies other “outflows” of lobsters from the ecosystem of comparable magnitudes. Any outflow of lobsters with the potential to exceed 10,000 lobsters or more per year was considered a significant source. Unlike commercial landings, recreational landings of lobsters are completely un-reported. The 2010 census population for the Bahamas is 352,747 people (Department of Statistics, 2011) (see **Figure 3**). This does not include second home owners, yachting tourists or illegal immigrants. The population trends will be examined in Section 4: Residents and Recreational Fishing; but even if each person consumed only a single lobster per year, the numbers of lobsters removed are significant. The overall population growth (1.16% growth rate from 2000 to 2010; Department of Statistics, 2010) will provide increasing competition between recreational and commercial fishing interests. There is limited spatial separation of the recreational and commercial fisheries; private boats can fish many of the fishing grounds in the northern and central Bahamas, and only the very southern end of the Great Bahamas Bank is limited to largely commercial fishing boats (e.g., Cay Lobos

area). Regional trends from Florida illustrate the management challenges when recreational fishers greatly outnumber commercial fishers in both numbers and effort (NOAA Recreational Fisheries Statistics, 2010).

Population structure (Figure 3) is also important to consider when evaluating trends in IUU fishing. The Bahamas has a very young population, with over 50% of the people in the country under the age of 23. The young population is just entering their child-bearing years, and the infrastructure on New Providence is already pushed to the limit. There are a number of government incentives to move people to other islands in the country<sup>8</sup>, and thus, increase the fishing pressure on and around other islands.

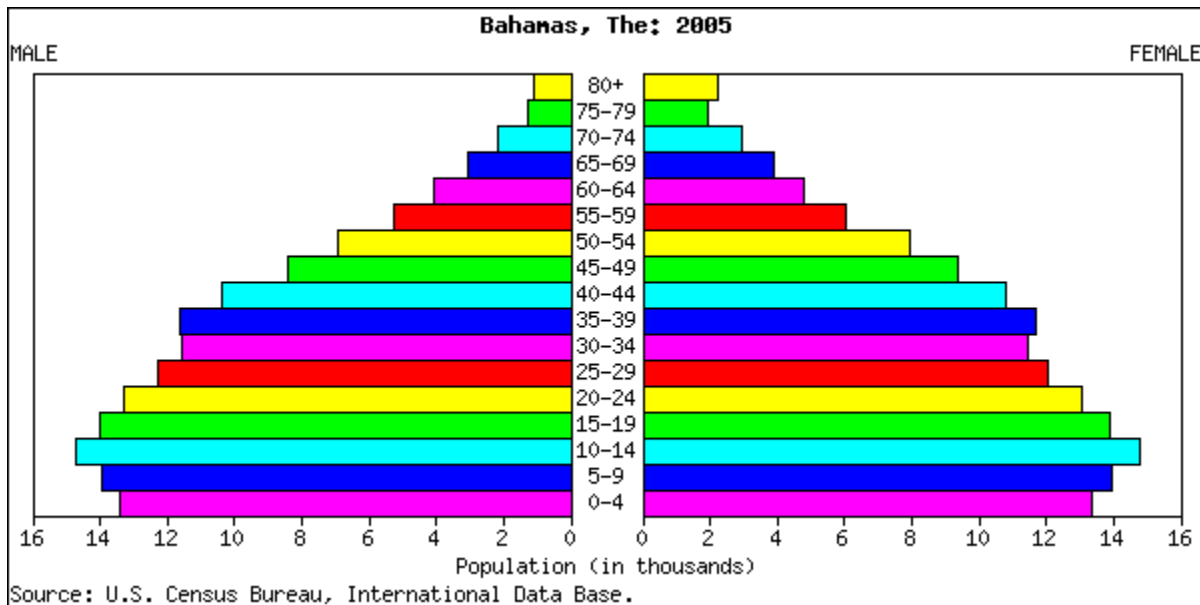
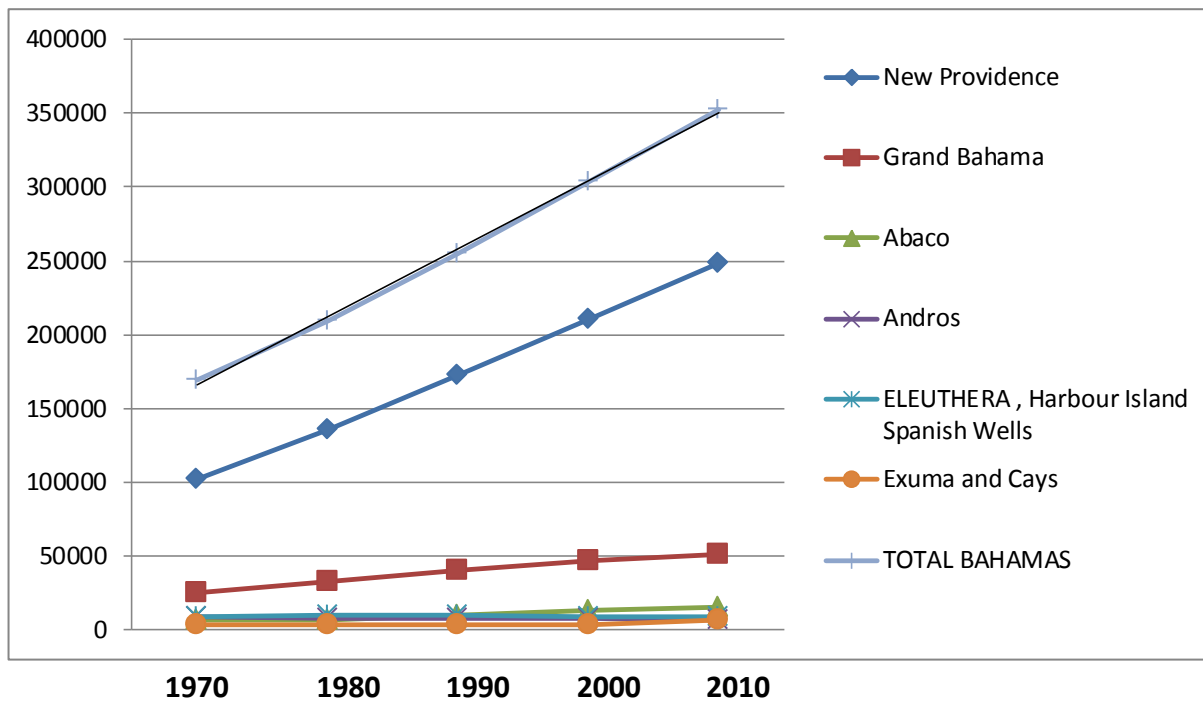
In addition to the physical removal of individual lobsters from the ecosystem, there are other ecological costs when undersized or gravid individuals are taken. The magnitude of recreational fishing, along with the degree of regulatory compliance is critical to understanding the level of fishing impacts around highly populated or rapidly-developing islands. Thus, it is important to document the nature of recreational fishing practices not only in New Providence but on other islands as well.

This report looks at the potential sources of lobster landings within the country, and attempts to document the magnitude of illegal fishing from foreign fishing vessels, particularly from adjacent nations such as the Dominican Republic.

The organization of the report focuses on three stakeholder groups: restaurants, residents and recreational fishers, and commercial fishers. The next section focuses on surveys of restaurants and resorts to understand patterns of lobster consumption by the local tourism market, primarily looking at the consumption of lobster dishes during the closed season, and serving of lobster meat dishes. The fourth section focuses on interviews throughout the Bahamas of recreational fishers and tourists to understand the level of recreational fishing, degree of regulatory compliance and deposition of lobsters from non-commercial fishers. The fifth section focuses specifically on interviews with commercial fishers and analysis of the spiny lobster market in the Dominican Republic to better understand the extent of illegal foreign fishing vessels in national waters. The last section includes a threats assessment of IUU fishing risks for the Bahamian lobster fishery.

---

<sup>8</sup> See an overview of “Anchor projects”, a government initiative to create large destination resorts on other islands (besides New Providence and Grand Bahama) to create jobs and shift populations out of Nassau at [http://www.bahamapundit.com/2007/03/by\\_larry\\_smith\\_.html](http://www.bahamapundit.com/2007/03/by_larry_smith_.html)



**FIGURE 3: Population growth and age structure within the Commonwealth of The Bahamas.**

Population growth within the country puts additional pressure on fisheries resources, especially the spiny lobster fishery. The 2010 census for The Bahamas shows important trends in the growth of the populations on several islands. The greatest population increase was seen on the island of Exuma, where the population almost doubled in 10 years from 3,571 people in 2000 to 7,314 in 2010. Increased populations put increased pressure on lobster fisheries in areas with little or no enforcement and monitoring. Out Islands of The Bahamas are poised for dramatic growth as most people in the country are young, and just starting their child-bearing years.<sup>9</sup>

<sup>9</sup> Population and demographic information from CIA Factbook, 2009, and Department of Statistics, Government of The Bahamas (2011) PRELIMINARY POPULATION AND HOUSING COUNT BY ISLAND AND SUPERVISORY DISTRICT, ALL BAHAMAS: CENSUS 2010. 3 pp.

### 3. RESTAURANT AND RESORT SURVEYS

**Who serves lobsters?** Restaurants and resorts serve lobsters as a luxury food item. Although most Bahamians do not believe the lobster fishery can be depleted, many visitors have heard some information about issues of overfishing and efforts to certify sustainable fisheries. Lobster meals are considered the highlight of visiting The Bahamas, and diners would like to enjoy a guilt-free meal in exchange for the premium price. Bahamians also like to eat lobster, and have an expectation that lobster meals will remain affordable to the general population.

A database was set up to collect information on restaurants, clubs and resorts throughout the country. The database especially targeted lobster consumption in New Providence, the population centre of the country. Information was obtained from the BTC 2010 phone book, site visits and phone interviews (See Appendix 2). Sales records from Tropic Seafood and J & J Heritage Seafood were also used to identify restaurants serving large numbers of lobster dinners (e.g., resorts) on other islands. The list was not exhaustive, and did not include all the restaurant business licenses issued on New Providence for small take-aways and diners. The emphasis was on larger businesses that advertised, and would be expected to have a larger number of dinners served, and potentially consume a significant number of lobsters in the course of a year. The threshold was set at 10,000 lobsters per year, based on the assumption that this would be an important, and potentially organized source of illegal fishing (versus occasional sales of undersized or out-of-season lobster).

The database was then compared to lobster tail sales records from processors and seafood wholesalers (members of BMEA). All restaurants were coded, and specific records remain anonymous. Government license records were not used, though, in the future, business licenses could be used to check and update the database. The final list of 110 targeted restaurants, resorts or private clubs was evaluated. All the restaurants on the final list could potentially serve a minimum of 200 lobster meals per week; or 10,000 lobster dinners per year. Some large tourist resorts can serve as many as 41,200 lobsters dinners per year at one restaurant (15,400 pounds for the August 2009 to July 2010 catch year).

The rationale was to identify entities that could potentially use 10,000 lobsters per year, and understand patterns of consumption and consumer awareness. Menu surveys and sites visited identified restaurants that serve only lobster tails, lobster meat dishes, or a combination of both meat and tail dishes. The database also records which restaurants served lobster dishes during the closed season (April through July). This was an informal survey; some businesses elected not to participate and about 16% of the targeted business gave no response in this preliminary summary (See **Table 2** for summary). The total number of restaurants and resorts contacted represented all of the major resorts and “lobster consumers” within the country, with the largest in-country consumer of Bahamian lobster tails being Atlantis Resorts on Paradise Island. All of the lobsters served at Atlantis come from a licensed processor and certified source during the closed season.

**TABLE 2: Summary of restaurant surveys.** 110 resorts/ restaurants were surveyed informally by phone calls, visits, or review of on-line menus. Information on sales from known processors and wholesale seafood sales were compared to menus to determine known sources of spiny lobsters for restaurants serving meat dishes and serving any lobster dish during the closed system.

<b>TOTAL NUMBER OF RESTAURANTS SURVEYED</b>	<b>110</b>
<b>SERVE TAILS ONLY</b>	19 (17%)
<b>SERVE MEAT ONLY</b>	24 (22%)
<b>SERVE BOTH TAIL AND MEAT DISHES</b>	33 (30%)
<b>KNOWN SOURCE OF LOBSTER ON MENU</b>	40 (36%)
<b>SERVE LOBSTER IN CLOSED SEASON</b>	20 (18%)

For the targeted restaurants, 17% served only lobsters tails. Most of these businesses advertised the size of the lobster tail, and included the higher end of prices for dinners (>US\$30 dinner). Many of the more moderately priced restaurants served only meat dishes (22%). This included restaurants popular with the local Bahamian population. Dishes included cracked lobster, lobster salad, lobster pasta dishes, lobster fried rice and seafood platters. 30% of the businesses served both lobster tails and lobster meat dishes. This included dinner and appetizer menu items. Of all the restaurants on this targeted list, about 36% bought their lobster from a known processor or seafood wholesaler. Most of the restaurants targeting tourists did serve lobster out of season, but many private clubs and businesses targeting Bahamians did not serve lobster during the closed season. Over 80% of the restaurants serving lobster out of season had a known supplier of frozen lobsters for April through July, which means these restaurants were likely not serving lobsters caught illegally out of season, but were relying on frozen stores held by a licensed processor.

**What are pathways for sale and consumption of undersized and out of season lobsters?** There are a relatively small number of high volume restaurants that could be potentially purchasing undersized lobsters for meat dishes. Lobster meat dishes are much less expensive (e.g. cracked lobster snack for \$13) and likely appeal to a wider consumer audience, particularly among Bahamians eating out. Lobster meat dishes listed on the menu are not always available, and frequently were not available “that day” when inquiries were made by phone. Business employees and managers were either very straight forward in stating their source of lobster from a local supplier, or less direct stating that there was a local fishing connection.

**Do consumers recognize legal size requirements for lobsters?** Friends of the Environment in Abaco have in place a campaign to target fishers and consumers with the “SIZE MATTERS” message. This campaign aims to reduce the catch of juvenile or undersized lobsters by making stakeholders more aware of the lobster regulations on size of catch. The campaign has provided the outreach to help fishers get the highest price for lobsters landed by promoting a Fishermen’s Sustainable Catch Program, and emphasizing the correct method to measuring a minimum of 5 1/2 inches tail length. In addition, the programme has highlighted the importance of the closed season for lobster reproduction. The message to fishermen highlighted the importance of a clean boat, keeping the lobster on ice, and protecting the value of the seafood product by proper handling.

The second part of the “Size Matters” campaign targeting the consumer is primarily directed at helping the consumer identify the legal size lobster tails at minimum of 5 1/2 inches. Consumers are encouraged to only buy lobster during the open season, though there is not a consensus on this issue. Lobster dinners are considered important to the tourist experience, and there are growing summer tourism opportunities during the closed months. Tropic Seafood holds less than 2% of the lobsters they process over for closed season sales within the country. This inventory is held for specific customers (e.g. large tourist-oriented businesses) as a luxury seafood item. The Department of Marine Resources also has a website that explains the protocol for measuring lobsters and clearly posts the regulations regarding the spiny lobster fishery. However, there are no requirements for restaurants to identify or document their source of lobsters, and the importance of lobster meat in traditional and affordable dishes provides an opportunity for undersized lobsters to enter the consumer market undetected.

Surveys of tourists in New Providence, Abaco and Eleuthera show that just over half (54%) know that there are size limits for lobsters, but most could not correctly identify a legal sized tail from scaled photographs of 4, 5, 6 and 7 oz tails. More effort can be put into a “Size Matters” type campaign (**Figure 4**) but there will need to be some agreement on serving lobster out of season. It will be less confusing for consumers, and build confidence in any certification process if lobsters were not served out of season (similar to Stone Crabs, which have a shorter open season, and are only served during the open season). Consumers did express concern

that they had expected a reputable restaurant to serve only legal lobsters (both legal size, and caught during the open season).

A preliminary review of the dataset on restaurants and surveys would indicate that the highest risk for the consumption of illegal lobsters would be from lobster meat dishes. Taking the worst case scenario, if 57 of the reported restaurants serving meat dishes only or tail and meat dishes obtained undersized lobsters for their menu, then as many as 570,000 lobsters could be consumed per year (Table 1). This is a substantial number, but only 5% of the current average number of lobsters exported annually.

<b>WORST CASE SCENARIO - 57 Restaurants serving undersized lobster; serving over 10,000 lobsters per year (minimum)</b>	570,000 lobsters
<b>Known Export market (4 year average)</b>	12,500,000 lobsters

All 110 restaurants were surveyed by either phone call or visits. Restaurant and resort monitoring is critical for the Bahamian Lobster Fisheries Improvement Project. This is an easily manageable task, and an important area for outreach and education with the Ministry of Tourism. The greatest risk in the in-country consumption of lobsters is the sale and use of under-sized lobsters, particularly in lobster meat dishes. Closed season sale of lobsters to restaurants does not appear to be a significant threat overall to the fishery. Tourists want to consume lobsters on their vacation, but want some assurance that the lobster is caught legally, and is properly cleaned.

The certification process for the spiny lobster fishery would need to include important actions:

- a.) Develop a long-term strategy on serving lobsters out of season, especially aimed at educating consumers where they can eat lobsters out of season that are from legal supplies;
- b.) Develop a strategy for monitoring the marketing and sale of lobster meat; and
- c.) Continue to promote partnerships with fishers and Bahamas Marine Exporters Association (BMEA) to reject the purchase of undersized lobsters and improve the quality of the landed product.

**Figure 4:** Outreach posters from Friends of the Environment, Abaco of the “Size Matters” campaign to educate consumers on the legal size of lobsters served in restaurants and resorts.

## SIZE MATTERS!



*Reducing juvenile  
lobster fishing in  
Abaco for future  
populations.*

#### 4. RECREATIONAL FISHERS AND RESIDENT SURVEYS

**Who fishes recreationally for lobsters?** Quantification of recreational fishing is perhaps the most difficult and labor intensive component of IUU fishing. Even the term “recreational fishery” is not entirely appropriate for most Bahamian fishers. Lobsters are a valuable seafood commodity and a luxury item. Lobster can be traded and used as cash. Bahamians traveling to the Family Islands for a funeral, home-coming or wedding expect to be able to bring lobster (and fish) back to Nassau. Lobster is often taken to relatives in the United States. Lobster is part of Bahamian cooking and cuisine. Who are the unreported lobster fishers?

- All small scale commercial fishers using boats under 20 feet that legally do not require a license;
- Bahamian residents who can consume, sell or trade their catch; and
- Visitors and tourists taking lobster during their stay in The Bahamas (legally required to have a fishing permit if cruising, and restricted to daily limits by Sports Fishing Regulations),

The Bahamas has a growing tourism industry based on yachting tourism (private vessels entering the country, and purchasing a cruising permit and fishing license) and second home/ home rental availability. Many tourists come to fish recreationally. There were two questions posed to Bahamian tourists and residents who fish for lobster, but do not carry a commercial license nor sell their catch as their primary source of income:

**1.) How much fishing do you do?** The question is aimed at estimating the number of lobsters taken from the ecosystem by tourists and Bahamians not for commercial purposes, and

**2.) To what extent are the lobsters taken by illegal means?** – Primarily by

- Destructive fishing methods (e.g. bleach or dynamite),
- Taking undersized lobsters, or
- Taking lobsters out of season or lobsters with eggs.

There is a history of IUU fishing that has had long-term impacts on reefs and their ability to function as habitats for lobsters. The trend has been to move away from known destructive fishing methods to better education and regulation of recreational lobster fishing. It is important to recognize at this point the amount of historical damage that has taken place to lobster habitat from 1950 through the early 1990’s. The Coastal Ecology of The Bahamas project has looked at 10 major islands throughout the Bahamian archipelago from 2002 through 2010: Abaco, north Andros, south Andros, Eleuthera, Exuma, Little Exuma, Long Island, Cat Island, Inagua and New Providence (See Sealey, 2010) Even on islands with relatively small human populations, there was historical damage at over 60% of coastal survey sites of

- Use of sodium hypochlorite (commercial bleach) on near shore corals,
- Use of perma-charge explosives on large reefs (especially on Molasses Reef off Inagua, ranked as one of the most “pristine reefs” in the Caribbean “Reefs at Risk” (Burke et al. 2004) assessment)
- Destruction of coastal wetlands and mangrove creeks that provide juvenile lobster habitat.

In other words, in addition to any trends and changes in recreational fishing practices, there have likely been significant alterations to near shore spiny lobster habitats, including juvenile nursery and adult reef habitats, throughout the archipelago. Habitat degradation and loss are two globally recognized causes of changes in abundance of species; Burke and Maidens (2004) reviews these change to Caribbean reefs as comparable in impact to over-fishing.

The recreational fishery targets the natural coral reef habitats of spiny lobster. The commercial fishery is based almost entirely on condos (artificial habitats) and baited traps. Assessment of the spiny lobster fishery will need to account for loss and degradation of habitat. The trend in recreational fishing pressure will be to increase fishing on the best reefs, or even increase the pressure to fish on protected reefs in “no take” areas. The Photo Log in Appendix 3 illustrates some of the lobster fishing practices throughout the country.

Interviews were conducted informally with people that expressed an interest in fishing. The conversation focused on the number of fishing trips/ expeditions taken primarily to catch spiny lobsters. 68 residents and tourists reported on their recreational fishing activities from six different islands: Cat Island (N=2), New Providence Island (N=27), Abacos (N=10); Eleuthera (N=8), Long Island (N = 8), and Exuma (N=12). No interviewee fished as a primary source of income; fishers that caught lobster for several weeks at the opening of the lobster season for sale were not included. Although not extensive, the interviews were aimed to capture only recreational fishing activity. All interviews were anonymous. The interviews were intended to just get an estimate of the number of lobsters taken from the Bahamian waters unreported and understand what illegal fishing may be taking place. More extensive tourism surveys in the Exuma Cays have established the importance of natural resources and fishing for yachting visitors (See Lowe and Sullivan Sealey 2003<sup>10</sup>).

Most Bahamians do not have boats, or do not have the capacity to travel a long distance from their home port; but the minority that do have access to boats can travel significant distances for extended trips. Some recreational fishers, especially women, do not swim, and thus only hook and line fish. There are however, several islands with the **market** (large number of second home owners, small restaurants or tourists that would buy lobsters directly from local fishers) and **means** (sufficient local capital to have boats, motors and fuel to fish) to land significant numbers of lobsters unreported<sup>11</sup>. The islands that should be targeted are highlighted in **Table 3**.

Although the fishing regulations are readily available on-line, and in many local government offices in the form of educational brochures, people have different interpretation of the regulation, and overall, feel there is very limited enforcement. No one was willing to discuss the amount of money generated by their fishing activities. People who were willing to be interviewed were asked to estimate about how many trips they made per month, and to estimate the number of lobsters landed per boat for each trip (tens of individual lobsters or hundreds of individual lobsters). Only a few day fishers from New Providence and Long Island reported that they landed “hundreds” of lobsters per trip.

Recreational fishers were directly asked if they fish for spiny lobsters in July before the open season. Many Bahamian residents will admit to fishing for “Summer Crab,” that is the taking of lobster out of season for personal consumption. All interviewees recognized the importance of leaving females with eggs, but would take lobsters, especially in late July, when given with the opportunity. There are many justifications for fishing before the start of season; but several key points emerged:

- Most resident fishers agree that lobster are less abundant now than they were ten years ago; and
- Most resident fishers agree that lobster populations fluctuate from year to year, based on their observations of their favorite “fishing spots.”

Seventeen fishers (25%) from Long Island, Exuma and Inagua admitted to fishing using destructive fishing methods at some time in the past, but claim that they do not use these methods now. There is a high level of problem recognition that the lobster fishery requires regulation; however, many people reported that “they were going to get the lobsters before someone else did...” The most fishing trips were made in August for residents and January through March for visitors. Using the information gained in interviews, an attempt was made to estimate the number of lobsters taken by recreational fishing (non-commercial) of residents and

---

<sup>10</sup> Lowe, Aimee M. and Kathleen Sullivan Sealey. 2003. Ecological and Economic Sustainability of tropical reef systems: Sustainable tourism in the Exuma Cays, Bahamas. In Proceedings of the 1999 International Symposium on Coastal and Marine Tourism: Balancing Tourism and Conservation. Washington Sea Grant Publications: 183-194.

<sup>11</sup> Residents can legally catch unlimited numbers of lobsters, and are not required to report catches.

visitors based on the number of people on the targeted islands that reported fishing lobster, and estimates of annual catches.

Unreported recreational catch of lobsters could be about 2.13 million lobsters (**Table 4**). This is also a large number, but again only 17% of known export landings. There is no doubt that some of the recreational fishing is also illegal (as well as unreported). With the growing tourist and resident populations, there is an increasing threat from not monitoring the recreational fishery, especially with that fishery occurring on coral reefs in declining health nationally. There seem to be two key issues relating to recreational fishing:

**1) A method for monitoring recreational lobster fishing among residents and tourists is needed.** The US-NOAA protocol uses random phone interviews to estimate the number and landings from recreational fishes, as well as creel surveys at critical marinas and harbours. Creel surveys may be a challenge in The Bahamas with many small points of landing for residents, but easier to monitor cruising tourists and yachts that are limited to larger public marinas and anchorages (especially in Abaco and Exuma).

**2.) A strategy for outreach, education and enforcement is needed** to address Bahamians and tourists that recreationally fish for lobster to ensure compliance with closed seasons, size limits and catch limits (for visitors). Along with information about the importance of marine parks and protected areas, Bahamians appear to need more information on the value of fisheries management for sustaining the spiny lobster fishery. There needs to be a more aggressive campaign of education and enforcement for visitors fishing in Bahamian waters.

**Table 3:** Bahamian islands that would have the highest recreational catch of lobsters are listed below with their population trends reported in the 2010 census.

ISLAND	POPULATION in 2010	PERCENT INCREASE	COMMENTS
ABACO	16,025	22% increase in over 10 yrs	Wealthy community with large number of second home owners, tourists renting homes, and large yachting tourism. High demand and available means for recreational fishing.
EXUMA	7,314	105% increase in over 10 yrs	Fastest growing region in the country, large number of second home owners, and large seasonal yachting tourism in Elizabeth Harbour. High demand and available means
ELEUTHERA with Harbour Island and Spanish Wells	11,165	Virtually no change in population since 2000	Overall Eleuthera lost population, with only small increases on Harbour Island and Spanish Wells. Less economic activity can push more people to fishing to supplement income.
GRAND BAHAMA	51,756	10% increase in over 10 yrs	No interviews conducted on Grand Bahama, estimates on recreational fishing come number of overnight tourists to the island in 2008 (Ministry of Tourism) and 2000 household census data (Department of Statistics).
NEW PROVIDENCE	248,948	18.1% increase in over 10 yrs	Most people on the island do not fish, but there are day fishers that leave from New Providence in boats under 20 feet to fish in the northern Exumas, southern Abaco and Berry Islands. Also wealthy expatriate population that can fish Andros, Green Cay or other areas. Lobsters are not the target except in early August with opening of season.

**Table 4: Estimate of number of lobsters potentially taken by recreational fishers.** Based on 67 interviews, the number of recreational fishers on five islands was estimated to gain some insight as to how recreational fishing of spiny lobsters might compare to the known exports of 12.5 million lobsters per year. Recreational catches could be 2.13 million lobsters or 17% of the known export landings. Recreational fishing is unreported, and is legal under the current fishing regulations.

ISLAND	BAHAMIAN POPULATION	Percent recreational fishers	Number of Lobsters taken by non-commercial Bahamian fishers (50 per fisher)	Air Tourist Arrivals from Dept of Statistics 2008	Lobsters taken by tourists (6 per person)	Total Number of lobsters taken by recreational fishers annually
ABACO	16,025	15%	120,188	29,430	176,580	296,768
EXUMA	7,314	20%	73,140	15,858	95,148	168,288
ELEUTHERA with Harbour Island and Spanish Wells	11,165	10%	55,825	15,498	92,988	148,813
GRAND BAHAMA	51,756	15%	388,170	85,572	513,432	901,602
NEW PROVIDENCE	248,948	5%	622,370	491,538	Virtually none of the hotel guests in New Providence fish	622,370
						2,137,841

## 5. COMMERCIAL FISHER INTERVIEWS AND ILLEGAL FISHING

**Who are the legal and licensed commercial fishers in The Bahamas?** The commercial Bahamian lobster fishery is the largest harvesting component of the resource; over 98% of the lobster caught commercially and sold to Bahamian processors is exported to the global seafood market. The amount of lobster tails exported is well documented, but the total number of lobsters taken out of Bahamian waters for sale and consumption outside of the country is unknown. There is significant commercial-scale illegal fishing pressure from foreign vessels entering Bahamian waters.

Bahamian commercial fishers are licensed through the Department of Marine Resources (See **Box 3**). This is not a limited-entry fishery. Any Bahamian national can become licensed to fish lobster following the existing regulations. There are a limited number of lobster traps licensed by DMR. Fishers can use surface-supplied air (hookah) to take lobsters at depths between 30 and 60 feet. A comprehensive list of the regulations and fisheries legislation is available on the DMR website at [www.bahamas.gov](http://www.bahamas.gov).

Bahamian commercial fishers are not formally organized<sup>12</sup>, and fishers operate out of a number of communities on different islands. Informal interviews with fishers from four different islands were conducted. The general consensus is that not all fisheries regulations are followed (**Table 5**). For example, fishers exceed the depth restrictions for use of surface-supplied air; however, Bahamian fishers also feel this does not impact the lobster fishery. **Table 5** outlines the trends in illegal fishing activities as reported by Bahamian commercial fishers. Fishers interviewed stated that they were both licensed and depended on fishing as their primary source of income.

Licensed commercial lobster fishers sell their catch to licensed exporters /processors. Exported lobster tails represent the largest and most profitable market. Sales of a few hundred to tens of thousands of pounds of

<sup>12</sup> There are attempts to form a national fishermen's association, and this effort is being headed by Mr. Adrian Laroda.

lobster are recorded and reported each month to the Department of Marine Resources<sup>13</sup>. Lobster tails are processed from the first week in August through the first week in April. Processing plants are closed for cleaning and repairs during the closed season, and an inventory of all frozen lobster tails is certified in April to insure no illegal closed-season lobster enters the market. BMEA members are committed to exporting the highest quality legal-caught lobster. There are only about 1,010 active commercial fishers throughout The Bahamas.

Interviews with commercial fishers within The Bahamas indicated increased compliance with landing only legal sized lobster within the open season because of the difficulty of selling quantities of undersized or out of season lobsters. The requirements and regulations on the export market to the USA, Canada or to Europe have greatly reduced the possible market opportunities for illegal lobster; the ban on export of lobster meat, as well as implementation of the Magnuson-Stevens Act in the USA has virtually closed markets for undersized lobsters.

Since 2007, market pressures on documenting the source of exported seafood has resulted in a much more vigorous approach by the Bahamas Marine Exporters Association (BMEA, see Bahamas Information Services, 2010) to reduce the processing of undersized lobsters. When lobster tails are purchased by processors, a small percent of the payment is withheld from the fishers pending processing. The initial phase of the thawing, washing and processing identifies undersized tails, and these are returned to the fisher, with payment deducted. Processors claim that less than 2% of purchased tails are returned. With education on improved catch sanitation and handling, as well as outreach information on measuring legal sized lobster, the number of undersized lobsters landed and sold to processors has been drastically reduced over the past 5 years<sup>14</sup>. In addition, the Department of Marine Resources has recently completed a series of meetings with fishing communities to outline new European Union regulations on recording catch certificates for exported seafood (Roberts, 2010).

Processors and restaurant buyers complained that in the past, some fishers would “stovepipe” undersized lobsters inside a bag of larger legal lobsters, thus selling a 30 to 50 pound bag of lobster tails with concealed undersized lobsters. With the enforcement from Department of Marine Resources in both the processing facilities and restaurants, purchasers are reluctant to buy lobsters from unknown sources. The combination of regulatory and human health issues has caused resorts and restaurants to prefer purchasing cleaned and processed tails from a trusted vendor over directly purchasing from fishermen or fish sellers. Over the past 10 years, more consumers have been alerted to the potential danger of contracting salmonella or even cholera from contaminated seafood (for example, Associated Press, 2011).

In short, there are several factors that have contributed to a high level of compliance among most of the larger commercial fishing communities, processors and seafood consumers. All the stakeholders have a vested interest in protecting the quality of the Bahamian lobster tail, and obtaining the best possible market price. High prices and quality of the product motivate compliance among stakeholders. Compliance with size limits, closed seasons and catch certificates, along with improved boat sanitation, handling of the lobsters landed, and processing all contribute to the quality of the exported lobster tail product to the greatest number of markets. There does not appear to be a significant component of IUU fishing among fishers and processors working predominantly for the export market. Tropic Seafood holds less than 2% of the total tons processed

---

<sup>13</sup> The European Union requires Catch certificates to accompany each export, thus licensed exporters (most are members of BMEA) report monthly sales to the Government of The Bahamas by fisher, by price per pound, and by number of pounds purchased.

<sup>14</sup> BMEA has reported a return of less than 2% of lobsters to fishers for being undersized. The Catch Certification requirements now allow the processor to track each sale, and reject undersized lobsters at the first step of processing.

for sale within the Bahamas over the closed season; this is typical of BMEA members. The vast majority of lobsters caught and processed in The Bahamas are targeted for export. The Government of The Bahamas collected a \$0.25 tax per pound of lobster exported; generating revenue from this project.

**BOX 3: REGULATIONS FOR COMMERCIAL FISHERMEN REGARDING LOBSTER SEASON<sup>15</sup>.**

Annual statement to permit holders:

The Department of Marine Resources advises that crawfish which have tails less than 5-1/2 inches in length, carapaces less than three inches in length, or which are bearing eggs, are not to be collected. "All persons capturing crawfish are required by law to have a measuring gauge onboard their vessel to ensure size compliance."

"Fishers are reminded as to the importance the crawfish industry plays to the economy of the Bahamas, employing thousands of Bahamians and contributing millions of dollars to the economy" the statement said. "All violators of the fisheries regulations can expect to be prosecuted to the fullest extent of the law." The crawfish season opens on August 1, and closes on March 31. During this period, fishermen are legally permitted to use air compressors to harvest crawfish.

"Persons expecting to utilize an air compressor to harvest marine resources must first obtain a permit from the Department of Marine Resources," the statement said. "The air compressor permit allows usage between depths of 30 feet and 60 feet." Anyone seeking to obtain an air compressor permit must first present proof of dive competency at the Department of Marine Resources. Application forms for air compressor permits may be obtained from the Department of Marine Resources on East Bay Street or the extension officer's headquarters in individual Family Islands.

The department asked members of the public who witness illegal behavior, or who suspect that illegal behavior may be taking place, to contact the Department of Marine Resources

**Table 5: Surveys of commercial fishermen on what illegal activities they believe occur within their own Bahamian fishing community.** Commercial fishermen from four islands were interviewed. The fishermen from New Providence were the most diverse group, operating from many different areas around the island from larger boats in Coral Harbour, to small "day boats" operating from Montagu Ramp.

TYPE OF IUU FISHING	ABACO	LONG ISLAND	NEW PROVIDENCE	SPANISH WELLS
<b>APPROXIMATE NUMBER OF ACTIVE FISHERS<sup>16</sup></b>	200	70	300	310
<b>NUMBER OF COMMERCIAL FISHERS INTERVIEWED</b>	12	9	22	18
Taking lobster on surface supplied air below depths of 60 feet	YES	YES	YES	YES
Taking lobster and selling lobster without a commercial license	NO	NO	YES	NO
Taking lobster out of season for commercial sale	NO	NO	NO	NO
Taking undersized lobster <sup>17</sup>	YES	YES	YES	YES

<sup>15</sup> From <http://www.bahamas.gov.bs/bahamasweb2/home.nsf/vContentW/MARI--Welcome--Dept.+of+Marine+Resources+Website!Opendocument>

<sup>16</sup> Based on information from Mr. Adrian Laroda working on a national fishermen's association.

<sup>17</sup> Although fishermen reported that some undersized lobsters were taken, they reported that this was not always intentional; all commented on the limited market for undersized lobsters, and the pressure within fishing communities to stop this practice.

**Who is fishing illegally in Bahamian waters?** The topic of illegal fishing by foreign fishing vessels is controversial in The Bahamas. There are three sources of foreign vessels: Cuba, the United States and the Dominican Republic. Of these three, the Dominican Republic poses the largest threat. Dominican vessels are active fishing in the Bahamas since 1996, and have increased in the number of vessels, size of vessels, and number of dinghies used in fishing. The Dominican Republic has one of the fastest growing human populations in the region with over 10,500,000 people in 2010<sup>18</sup>. There are several points that support the arguments as to why the Dominican Republic, not Cuba nor the United States, pose the largest threat to the Bahamian lobster fishery.

The United States is close to The Bahamas, with thousands of private yachts entering the country each year. There are now active cooperative programmes between the Government of The Bahamas and the United States of America (USA). The USA monitors imports and arrivals in south Florida for immigration and contraband concerns. The Bahamas Information Service reported on successful prosecutions of illegal seafood imports. The collaboration between the Department of Marine Resources and the US Fish and Wildlife Service is a powerful deterrent.<sup>19</sup>

The Lacey Act (USA Statutes 16 U.S.C. §§ 3371-3378) protects both plants and wildlife by creating civil and criminal penalties for a wide array of violations. The Lacey Act prohibits trade in wildlife, fish, and plants that have been illegally taken, possessed, transported or sold. Thus, the Act underscores other federal, state, and foreign laws protecting wildlife by making it a separate offense to take, possess, transport, or sell wildlife that has been taken in violation of those laws (USFWS 2010). The Act prohibits the falsification of documents for most shipments of wildlife (a criminal penalty) and prohibits the failure to mark wildlife shipments (civil penalty). This includes the shipment of spiny lobster from The Bahamas to the United States without export permits or taken by foreign nationals in excess of the sportsfishing limits (6 lobsters in possession per person). The United States is not a likely source of illegal removal of lobsters from The Bahamas simply because the sale of illegal seafood in the US is so difficult.

Although Cuban vessels have fished illegally in The Bahamas in the 1970's, today there is virtually no threat from Cuba illegal fishing in Bahamian waters. Fishing vessels in Cuba are government-owned, and illegal fishing on a commercial scale would be a major political issue for two neighbors working on broader areas of cooperation. Bahamian relations with Cuba were strained by disagreement over territorial fishing rights in the 1970's after independence. The disagreement came to a head in May 1980, when Cuban military aircraft sank a Bahamian patrol vessel, the **HMBS Flamingo**, after **HMBS Flamingo** crew had apprehended two Cuban fishing boats. Four Bahamian marines were killed during the event. The Bahamas demanded an unconditional apology and full reparations. Cuba agreed to the Bahamian demand and paid to replace the patrol vessel as well as provide monetary compensation to the families of the four marines. The two nations continued diplomatic relations despite the incident. Cuba was the only communist nation with which the Bahamas maintained diplomatic relations. Cuban fisheries are under state control and at this time, there are virtually no reports on poaching from Cuban vessels to the Department of Marine Resources or the Royal Bahamas Defense Force.

The Bahamian Government's policy reserves the commercial fishing industry for the exploitation by Bahamian Nationals as far as possible. Commercial fishing vessels fishing within the Exclusive Economic Zone (EEZ) must be 100% Bahamian owned. Seafood processing facilities have been placed on the list of areas specifically

---

<sup>18</sup> See <https://www.cia.gov/library/publications/the-world-factbook/geos/dr.html>

<sup>19</sup> See [http://www.thebahamasweekly.com/publish/bis-news-updates/Bahamian\\_fisheries\\_laws\\_and\\_the\\_United\\_States\\_Lacey\\_Act\\_violated\\_printer.shtml](http://www.thebahamasweekly.com/publish/bis-news-updates/Bahamian_fisheries_laws_and_the_United_States_Lacey_Act_violated_printer.shtml)

available for overseas investors. However, exceptions to this policy in 1992 opened the door for the current crisis of illegal fishing by Dominican vessels. In 1992, Mr R. Whitney Bastian requested that work permits be issued for foreign engineers on Bahamian fishing vessels. Mr Bastian, a Member of Parliament from South Andros argued successfully that foreign labour was needed on fishing vessels to expand the commercial fisheries and that there were not enough Bahamians available to work on fishing vessels. The work permits issued for Mr Bastian went primarily to Dominican fishermen and captains. These individuals were able to work legally in The Bahamas, but also gain invaluable knowledge of the fishing ground, especially the southern Great Bahamas Bank. Many people today believe this decision allowed Dominicans to gain local knowledge of the waters, make contacts within the Bahamian government, and convince investors to re-capitalize a failing Dominican fishing fleet that targeted Bahamian fishery stocks.

**Why are Dominicans fishing in Bahamian waters?** The relationship with the Dominican Republic and The Bahamas is quite different than the relationship with the USA or Cuba. Although both countries are members of the Caribbean Forum (CARIFORUM, a subgroup of African, Caribbean and Pacific group<sup>20</sup> (ACP), there is limited cooperation in terms of the Georgetown Agreement goals of establishing a “new, fair and more equitable world order”. The ACP States includes 15 Caribbean Community countries that serve as a block for economic dialogue with the European Union. There are large differences in GDP and income typically earned by fishers; the Bahamas being wealthier, with a smaller more educated population aiming at export fisheries.

The news reports and articles on seizures of Dominican vessels in The Bahamas were at an all-time high in 2010<sup>21</sup>. There have been a number of high profile seizures of Dominican fishing vessels in Bahamian waters as well as exchange of gunfire between Bahamian and Dominican fishers<sup>22</sup> already in 2011. Emotional editorials on the apparent inaction of the Government of The Bahamas in stopping foreign fishing vessels are vetted in blogs and newspapers<sup>23</sup>. One serious problem in estimating the total number of lobster removed from Bahamian waters was the lack of official documentation. There are no records of phone calls or radio reports of Bahamian fishermen reporting suspected foreign vessels in Bahamian waters, nor any documented follow-up by the Royal Bahamian Defense Force. There appears to be a high level of distrust between RBDF and fishers, and no clear protocol for reporting, follow-up and response.

There are several important economic and marketing factors that should be reviewed. The Dominican Republic is a rapidly growing island democracy with a population of about 10.5 million people in 2011. The GDP per capita in the DR is less than one third the GDP per capita in The Bahamas. There is high unemployment (15%), and a large labor force (4.4 million people) with limited educational opportunities. The growth of tourism in the DR has been impressive, with relatively new developments like Punta Cana playing an important role in the balance of trade in the country. Tourism arrivals are reported at 4,239,686, with arrivals by air at 3,783,365, and by cruise ships at 456,321<sup>24</sup>. Punta Cana has in excess of 19,000 hotel rooms in this one tourism centre, more rooms than available in all of The Bahamas. Public records available<sup>25</sup> show 89,000 pounds of lobster tails EXPORTED from the Dominican Republic in the past year, but no records of IMPORTS for the over 745,000 lobster dinners estimated to be served at Punta Cana resorts in 2010.<sup>26</sup>

---

<sup>20</sup> [http://www.acpsec.org/en/about\\_us.htm](http://www.acpsec.org/en/about_us.htm)

<sup>21</sup> See Nassau Guardian or Nassau Tribune on-line search results like [http://www.bahamaslocal.com/search\\_news/POACHING/10/default/2](http://www.bahamaslocal.com/search_news/POACHING/10/default/2)

<sup>22</sup> Perdomo, 2010 in Dominican news, and similar stories in Appendix 6.

<sup>23</sup> See [http://www.weblogbahamas.com/blog\\_bahamas/2010/07/bahamas-fishing-industry-problems-swept-under-the-table.html](http://www.weblogbahamas.com/blog_bahamas/2010/07/bahamas-fishing-industry-problems-swept-under-the-table.html)

<sup>24</sup> based on 2009 Dominican Ministry of Tourism statistics

<sup>25</sup> Globally, sales and prices of seafood exports can be tracked at [www.urnerbarry.com](http://www.urnerbarry.com).

<sup>26</sup> Lobster dinners reported served by resorts based on occupancy rates of 70% over 35 weeks (winter season).

This tourism pattern is exactly reversed in The Bahamas, of the roughly 4.5 million tourist arrivals; over 3.1 million are by cruise ships, with a smaller percentage of that total arriving by plane and staying overnight. The size of the Dominican resort and hotel tourism industry presents an almost unlimited demand for luxury seafood such as spiny lobsters. Punta Cana resorts have lobster on the menu for US\$16, about half the cost of a lobster tail dinner in Nassau. The question of “How many” lobsters are removed from Bahamian waters becomes more urgent, as there are clearly strong market demands for spiny lobster within the Dominican Republic.

The overall objective of this component of the report was to look at all types of information to determine the best estimate of the total number of lobsters that could be taken out of Bahamian waters by Dominican fishing vessels. The assessment included:

- Interviews with Commercial fishermen, especially fishers from Spanish Wells and South Andros. These fishing boats are among the largest in the Bahamian fishing fleet, and spend the most time on the Great Bahamas bank. Spanish Wells fishers have a long history of fishing in the community, and provide the most vociferous complaints about foreign fishing vessels (though all fishers interviewed reported foreign vessels poaching as the most serious issue);
- Interviews with active and retired Royal Bahamas Defense Force personnel to understand the protocol for apprehending foreign fishing vessels;
- Interviews with Dominican scientists, government officials and conservationists on the status of the commercial lobster fishery within the country, and their knowledge of seafood landings, as well as;
- Investigations into the size of the market of lobster tails within the Dominican tourist industry compared to the documented imports of seafood products.

All interviews were conducted anonymously, and the purpose was to get an estimate of the magnitude of illegal fishing within The Bahamas, particularly looking at lobsters landed and sold within the Dominican Republic. Bahamian fishers interviewed considered illegal fishing to be the most serious threat to the health and profitability of the lobster fishery. The commercial fishers interviews help characterize the foreign fishing threat. The typical Dominican vessel reported in Bahamian waters is a large “mother ship” usually greater than 65 feet in length attended by many (10’s) smaller fishing skiffs or dinghies. Small groups of fishers operate from the skiffs using surface supplied air (hookah) to fish with spears. The mother ship and skiffs is an unusual fishing model for the Dominican Republic considering fish stocks are severely over-fished, and over 52% of the available marine coastal habitats are closed to commercial fishing as marine protected areas (Figure 4). Dominican fishers are reportedly fishing at depths well below 60 feet, with divers fishing to depths over 200 feet, potentially impacting deep reef resources not legally fished by Bahamians. A review of the marine protected areas in the Dominican Republic as well as the Bahamas illustrates the problem <sup>27</sup>

Foreign fishing vessels operate across the southern Bahamas, venturing further north and across the Great Bahamas Banks during the summer when the lobster fishery is closed to Bahamian fishers. The question remains how many Dominican vessels are fishing in Bahamian waters? Dominican sources suggest that there are three ports on the north coast: Puerto Plata, Luperón and Pepillo Salcedo. Puerto Plata is the largest harbour close to a large population center and industry for processing large catches. Luperón and Pepillo Salcedo are much smaller, with limited access by road, Luperón being the most protected anchorage on the northern coast (Figures 5 and 6).

---

<sup>27</sup> See <http://campam.gcfi.org/campam.php> to see an overview of the Caribbean Challenge Initiative and protection areas initiatives with the United Nations Environmental Programme.

Foreign fishing vessels in Bahamian waters are a serious concern among Bahamian commercial fishers not only for the impact on the overall lobster fishery, but for personal loss of revenue and risk. There have been several incidents with the exchange of gunfire between fishing vessels. The Dominican vessels are considered armed and dangerous. Vessels do not respond to radio hailing, and allegedly do not follow international maritime regulations or protocols. The illegal sale of lobsters from foreign boats to Bahamians has been reported, but unverified.

Royal Bahamas Defense Force (RBDF) interviews were less useful in getting to the actual number of Dominican boats that might be operating in Bahamian waters. There are no accessible records of reports or sightings of foreign fishing vessels, though anecdotal information puts the number at about six per month (six reports from fishers or other sources sighting a suspected foreign vessel fishing in Bahamian waters). What the RBDF interviews did highlight was the lack of a clear protocol for dealing with reports or sightings of foreign fishing vessels. There appeared to be a certain level of mistrust on both sides when talking to fishers and RBDF personnel.

It might be concluded from the RBDF interviews that illegal fishing interdiction is not a priority for the patrol vessels. Also, much of the illegal fishing likely takes place during the closed season when Bahamian fishers are traditionally targeting snapper aggregations or repairing their vessels; thus there are fewer reports of illegal foreign fishers from April to August; however, the Dominican government has made several large seizures of lobsters caught out of season<sup>28</sup>. The issue of illegal fishing is a long-standing concern for the Dominican government and conservationists, as within the country many coral reef resources are now protected in National Parks (Figure 4).

A major task for this report was to try to estimate the potential for spiny lobster landings in the Dominican Republic. The landings of these fishing vessels include conch, finfish and spiny lobster, so this illegal fishing is not restricted to the spiny lobster fishery alone.<sup>29</sup> An initial estimate of the number of lobsters taken out of Bahamian waters is calculated below based on a catch of 10,000 pounds. 10,000 pounds of lobsters represents 23,000 seven-ounce lobsters. 10,000 pounds was the smallest amount seized on fishing vessels (see Appendix 6). If 30 Dominican vessels operated in Bahamian waters, for six trips per year, with a catch of 10,000 pounds per trip, then 1,799,965 pounds of lobster would be removed from Bahamian waters. This represents a low estimate of illegal landings, and this amount is 35% of the known legal export of 12.5 million lobsters from the Bahamas.

<b><i>ESTIMATE OF DOMINICAN ILLEGAL FISHING</i></b>	<b>NUMBER OF LOBSTERS</b>	<b>POUNDS OF LOBSTERS</b>
<b>30 Dominican boats operating</b>		
<b>6 trips per year per boat</b>		
<b>10,000 pounds Lobster per trip</b>		
<b>24,038 lobsters taken per trip</b>	4,326,840	1,799,965
<b>KNOWN BAHAMIAN EXPORTS (4 year average)</b>	12,500,000	5,200,000

<sup>28</sup> See article <http://www.elnacional.com.do/nacional/2010/7/13/54297/Incautan-langostas-y-vehiculos-arrestan-20-en-Luperon>

<sup>29</sup> See Appendix 6 recent description of a vessel M/V Adrian I seized in Bahamian waters; with international news report at <http://www.aquaticcommunity.com/news/lib>

This landings estimate is based on several assumptions. First, the number of large fishing vessels over 60 feet in length are the type of vessel most capable of fishing in Bahamian waters. A count of the number of large fishing vessels, dockage and infrastructure (e.g. roads, ice, adjacent processing facilities and market demand) to move landed catch was evaluated for the three northern ports. Puerto Plata has the largest capacity for fueling and off-loading commercial fishing vessels; however, Luperón has the best anchorage within the embayment. Lobsters are not the exclusive target of foreign fishers in Bahamian waters; queen conch, grouper and other finfish are also targeted, and highly marketable in the Dominican Republic.

One difficulty in the evaluation of illegal fishing is that the geography and history of this area has supported other illegal activities, primarily the smuggling of people and contraband. The island of Hispaniola is recognized as an important trans-shipment site for cocaine, heroin and marijuana to travel from South America to the United States. There is effectively no border control between Haiti and the Dominican Republic, thus fisheries landings are not likely a top priority for international law enforcement. The Bahamas stands to lose the most in terms of environmental damage from illegal destructive fishing as well as loss of fisheries income and employment. In a US report on the Caribbean drug trafficking, fishing vessels are explicitly linked to drug trafficking:

*“Commercial fishing vessels also are well-suited for mother ship operations because they typically have capacities for large shipments and are equipped with sophisticated navigation and communication instruments. Consequently, they do not require refitting that indicates the vessel’s roles in smuggling operations. Fishing vessels also are able to stay at sea for long periods and travel long distances. Additionally, fishing vessels are difficult to monitor and tight-knit fishing communities make infiltration by drug law enforcement authorities difficult.” (USA-DOD May 2000).*

The potential for large illegal lobster landings in the Dominican Republic is huge. The implications in terms of lost jobs, lost revenues to the Government of The Bahamas, and lost fisheries resources are hundreds of millions of dollars if the current export fishery collapses. For a cash-limited national economy, this is a serious threat to national security and economic growth. Once lobsters are landed within the Dominican Republic, it is virtually impossible to track their deposition or fate, as very little reporting is required. Only small amounts of lobster (about 80,000 pounds) were documented as exported from the DR to the USA. There is a small-boat lobster fishery in the Dominican Republic based around Jaragua to the southwest of Santo Domingo.

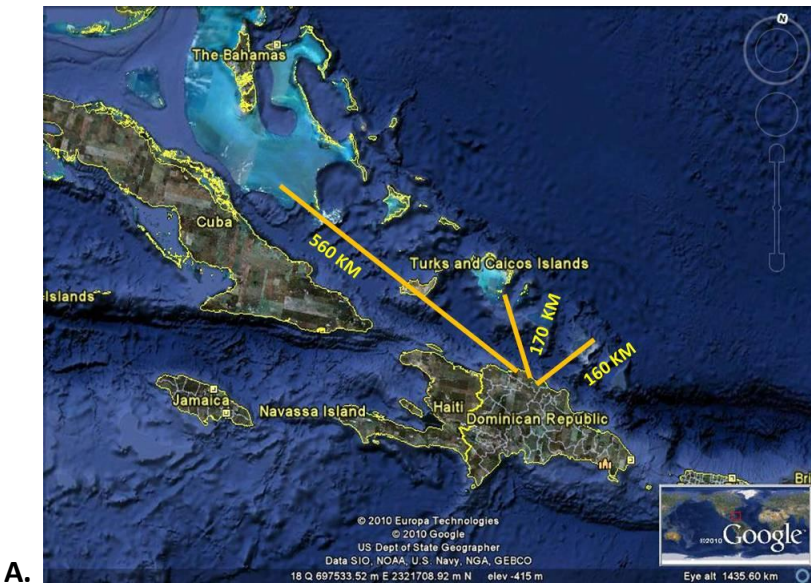
There are obviously networks of supporting parties that allow the illegal fishing to continue so successfully, and the key to reducing the illegal fishing loss is to prevent illegal fishers from entering Bahamian waters. The process of seizures and prosecuting illegal fishers, along with the cost associated with holding the vessels, crew and catch is largely ineffective. There are charges of corruption, and clearly strong motivation with the amount of money involved in the sale of lobsters.





**FIGURE 6: Map of ports along the north coast of the Dominican Republic.** There are three locations that fishing vessels could be using to fish in both the Turks and Caicos Islands and in The Bahamas, with Pepillo Salcedo, on the border with Haiti being the smallest and least protected. From the northern Dominican Republic, it is about 590 km to the southern Great Bahama Bank, a trip that take 2-1/2 days for a fishing vessel making 10-12 knots.

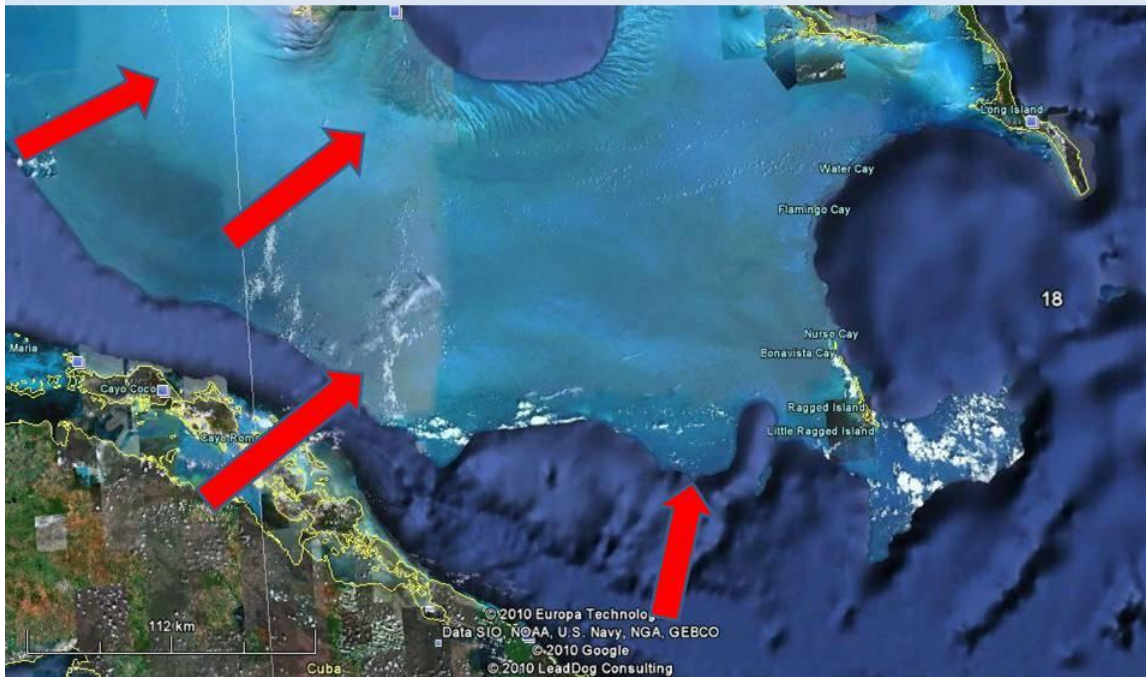
**FIGURE 7: Maps that illustrate the distance from Dominican ports to Bahamian fishing groups (A). Foreign fishing vessels are most frequently reported fishing at the southern end of the Great Bahamas bank (B and C)**



**AREAS IDENTIFIED BY FISHERMEN AS THE PRIMARY LOCATIONS FOR ILLEGAL FISHING ACTIVITY ALONG THE SOUTHERN EDGE OF THE GREAT BAHAMA BANKS: DOMINICAN FISHING BOATS ARE REPORTED TO BE FISHING ALONG THE PLATFORM MARGIN, THESE BOATS ARE REPORTED TO BE FISHING DEEPER THAN BAHAMIAN FISHERS, AND EXPLOITING GROUPE AGGREGATIONS ALONG THE DROP-OFF AND PROMATORIES**



**AREAS INDICATED AS “AT RISK” FOR OVERFISHING FROM ILLEGAL FISHING BOATS:** The Southern Bahama Banks appears to be the most vulnerable area to illegal fishing. Dominican fishing boats are reported to be fishing along the western length of the platform margin, as well as across the banks to southern Andros and Tongue of The Ocean.



C.

## 6. THREATS ASSESSMENT OF IUU FISHING RISKS AND RECOMMENDATIONS

**What do the interviews and assessments to date tell us?** The interviews conducted helped identify unreported landings as well as commercial-scale illegal harvesting. Based on the spatial scale of the fishing, the number of lobsters removed from the ecosystem, and the potential for increased pressure, the fishing threats were analyzed and ranked. The unreported fishing activity by recreational fishers at this point can be characterized as unreported and unregulated, not illegal. Fisheries and fisheries-independent information sources will be critical in evaluation of the overall population trends for spiny lobsters. The greatest threat to the Bahamian spiny lobster fishery is foreign illegal fishing because of the spatial extent, potential for commercial-scale fishing, and likelihood to increase in the future.

**Table 6:** Prioritization of threats to the Bahamian spiny lobster fishery based on the potential to remove large numbers of lobsters. The three highest threats are from illegal foreign poaching, and then from illegal fishing by the Bahamian commercial fishing fleet by non-compliance to existing regulations

CATEGORY	PERPUTRATOR/ ACTIVITY	INDICATORS	HIGH	MED	LOW
ILLEGAL	FOREIGN FISHING VESSELS ENTERING BAHAMIAN WATERS TO CATCH LOBSTERS	RBDF Seizures, Consumption of lobsters in DR			
ILLEGAL	TAKING LOBSTERS WITH RESTRICTED GEAR by bleaching, using SCUBA, using compressors below 60 feet	DMR Seizures			
ILLEGAL	TAKING UNDERSIZED LOBSTERS by both illegal and legal fishers	DMR Seizures			
ILLEGAL	TAKING LOBSTER during the closed season (April through July) or LOBSTERS WITH EGGS	DMR Seizures			
ILLEGAL	TAKING LOBSTERS FROM RESTRICTED AREAS, poaching from National Parks and Marine Fisheries Reserved. "No Fishing" Protected areas are too small at this time to have significant impact on lobster stocks	BNT, RBDF and DMR arrests			
UNREPORTED	LEGAL FISHING BY BAHAMIANS fishing without a commercial license (in boats less than 20 feet) or recreationally	Population size on islands, and access to boats			
UNREPORTED	LEGAL FISHING by tourists and yachting visitors within the limits set by Sports fishing regulations	Number of tourist arrivals, number of yachts			

“Illegal” fishing is the taking of lobster by any means that are in violation of the existing laws and regulations. The greatest losses from illegal fishing are likely from foreign fishing vessels operating in Bahamian waters. “Unreported” fishing includes fishers whose activity and information not available to the relevant national authority or regional organisation; and this is all of the recreational lobster landings in the country. The organization of the report focused on three stakeholder groups: restaurants, residents and recreational fishers, and commercial fishers. The surveys of restaurant and resorts revealed that most large restaurants serve legal sized lobster from known wholesalers, and overall, the potential risk for undersized lobster to be consumed in the restaurant industry is only 5% of the current export quantities. Non-government organizations are involved in the outreach and education to promote local compliance with size and closed season regulations.

Interviews throughout the Bahamas of recreational fishers and tourists revealed a much larger potential for illegal landings, and should be an area to monitor to document legal landings. Residents admit to a low level of regulatory compliance when fishing small amounts of lobsters for local consumption or sale. This review indicates that the greatest number of lobsters caught and removed from the ecosystem is likely through illegal foreign fishing in Bahamian waters. An interview with commercial fishers and analysis of the spiny lobster

market in the Dominican Republic indicates a large domestic market with a sizable fishing fleet to access Bahamian waters.

**TABLE 1 (REPEATED): ESTIMATED TOTAL BIOMASS AND NUMBERS OF SPINY LOBSTERS REMOVED FROM BAHAMIAN WATERS BASED ON LEGAL AND IUU FISHING<sup>30</sup>**

FISHERY COMPONENT	NUMBERS OF LOBSTERS	NUMBER OF POUNDS	PERCENT OF TOTAL SPINY LOBSTER LANDINGS
<b>KNOWN EXPORTS</b> – with documentation from Bahamas Marine Exporters Association (BMEA) members, assumption of no IUU catch in these exports. <sup>31</sup>	12,500,000	5,200,000	<b>63.99%</b>
<b>ILLEGAL FOREIGN FISHING</b> (Dominican Republic vessels, 2009-2010 landing estimate)	4,326,840	1,799,965	<b>22.15%</b>
<b>RECREATIONAL</b> (unreported and/or illegal)	2,138,741	889,716	<b>10.95%</b>
<b>RESTAURANTS</b> (illegal or unaccounted sources)	570,000	237,120	<b>2.92%</b>

### Recommendations for Monitoring the Bahamian Lobster Fishery

Based on the research conducted for this report, recommended next steps for combating IUU fishing in The Bahamas are outlined below:

- 1.) Establish a system of interviews or creel census stations to understand and document the extent of recreational fishing by Bahamians and tourists (see Schmied and Burgess 1987). This can be coupled with a system for monitoring the in-country consumption of lobsters;
- 2.) Continue to monitor the sale, processing and export of lobsters through processors such as BMEA members and using the help of non-governmental organizations;
- 3.) Continue to strengthen the current education and enforcement efforts for commercial fishers within Bahamian waters;
- 3.) The most effort should be put into the documentation and monitoring of illegal fisheries landings in the Dominican Republic. There are several options for action. One of the highest priorities would be to work more directly with the government of the Dominican Republic to identify the vessels and their financiers that illegally fish in Bahamian waters.
- 4.) Work with commercial fishermen in The Bahamas to review and possibly revise regulations regarding depths for use of compressors. The 30 foot to 60 foot range is not enforceable, and work is needed to either educate fishers on the need for a depth refuge for lobsters, or revise the regulations.

<sup>30</sup> Based on interviews completed and documents reviewed for this report.

<sup>31</sup> BMEA is made up of the seven largest licensed lobster exporters in The Bahamas. There are a total of 11 companies licensed to export as of April 2011. Non-BMEA members contribute less than 5% to total lobster exports.

## 7. REFERENCES AND RELATED READING

Author	Title	Date	Published	Volume	Page
<b>Agnew, D. J. , J. Pearce, G. Pramod, T. Peatman, R. Watson, J. R. Beddington, T. J. Pitcher</b>	Estimating the Worldwide Extent of Illegal Fishing	2009	Plos One	4(2) e4570	7-Jan
<b>Associated Press</b>	Lobster blamed on Cholera at Dominican Wedding	2011	<a href="#">ABC News/ Health</a>	27-Jan-11	
<b>Austin, CB</b>	Difficulties of limiting entry into the over capitalized Florida spiny lobster fishery	1981	Proceedings of the Gulf and Caribbean Fisheries Institute	38	184-200
<b>Bahamas Information Service</b>	Marine Exporters Association to work with Government	2010	<a href="http://www.bahamasb2b.com/news/2010/09/marine-exporters-association-to-work-with-government-1719.html">http://www.bahamasb2b.com/news/2010/09/marine-exporters-association-to-work-with-government-1719.html</a>	5-Sep-10	
<b>Ball, D.E.</b>	Report on crawfish meat extraction and assistance to processors in the Bahamas	1979	FAO Technical Report. Rome (Italy)		37 pp
<b>Burke, L and J. Miadens</b>	Reefs at Risk in the Caribbean.	2004	World Resource Institute< Washington, D.C.	September 2--5	239 pp.
<b>Food and Agriculture Organization of the United Nations</b>	Implementation of the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing.	2002	FAO Technical Guidelines for Responsible Fishing, Rome (Italy)	Number 9	122 pp
<b>Government of the Bahamas, Department of Marine Resources</b>	Five Year Sector - Strategic Plan 2010-2014	2009	Ministry of Agriculture and Marine Resources		55 pp.
<b>Government of The Bahamas, Department of Statistics</b>	Preliminary Report on the 2010 Census, Commonwealth of The Bahamas	2011	Department of Statistics, Nassau, Bahamas		
<b>Haughton, M.O.</b>	Compliance and Enforcement of Fisheries Regulations in the Caribbean	2003	53rd Proceedings of the Gulf and Caribbean Fisheries Institute	53	188-201

<b>Muñoz-Nuñez, D.</b>	THE CARIBBEAN SPINY LOBSTER FISHERY IN CUBA: An approach to sustainable fishery management	2009	M.S. Thesis, Nichols School of the Environment, Duke University, Durham, NC, USA	97 pp.
<b>NOAA-NMFS Southeast Fisheries Science Center</b>	Southeast and Caribbean Invertebrate Fisheries	2004	Unit 11 Our Living Oceans, 6th Edition. NOAA, Silver Springs, MD	173-179
<b>Perdomo, A.</b>	Dos dominicanos son heridos por pescadores de Las Bahamas	2010	Digital Hoy	30-Jun-10
<b>Roberts, T</b>	Fishermen's meeting explains new regulations	2010	The Abaconian	15-Jun-10
<b>Schmied, R and E. Burgess</b>	Marine Recreational Fisheries in the Southeastern United States: An Overview	1987	Marine Fisheries Review	49(2) 7-Feb
<b>Sealey, K</b>	State of the Coast Long Island	2010	Earthwatch Institute Annual Report; Coastal Ecology of The Bahamas	49 pp.
<b>Torres, Ruben</b>	Reef Check Dominicana	2010	Personal Communications – regarding the status of the lobster fishery in the Dominican Republic	
<b>Torres, Ruben</b>	Crecen los peces y la esperanza en La Caleta	2009	Clave del día de hoy	14 de mayo 2009 13

## APPENDICES

**APPENDIX 1: Conversion of weight to number of lobsters extracted.** Sustainability of fisheries is dependent on maintaining the ecological function of the target species. Spiny lobsters play an important role on reefal habitats as detritivores. The catch and export of lobsters is reported in pounds for each size of tails. The following table provides a conversion for pounds of tails to number of individual lobsters removed from the ecosystem.

TAIL SIZE	NUMBER OF LOBSTERS PER POUND (16 ounces) CONVERSION FACTOR
5 oz tail	3.2
6 oz tail	2.7
7 oz tail	2.3
8 oz tail	2
9 oz tail	1.8
10 oz tail	1.6
10-12 oz tail	1.45
16-22 oz whole boiled	0.8

Equation used to convert the number of tails processed in pounds to number of lobsters removed from the ecosystem.

$$\frac{\text{Pounds of lobster}}{\text{Size of tail (oz)}} * \frac{16 \text{ oz}}{1 \text{ pound}} = \text{Number of individual lobsters}$$

**APPENDIX 2: Restaurant Database for targeted resorts, clubs and restaurants with the potential to serve over 10,000 lobster meals per year.**

<b>RESTAURANT NUMBER</b>	<b>Menu Prices for Lobster dishes</b>	<b>WHOLE TAILS</b>	<b>MEAT DISHES</b>	<b>Both Meat and Tails served</b>	<b>KNOWN SOURCE OF LOBSTERS ?</b>	<b>SURVEY COMMENTS</b>	<b>MENU NOTES</b>	<b>Serve lobster out of season?</b>
1-AG	\$40.00			YES	YES	Served during closed season, as long as supplies last	2 6oz tails in one dinner	YES
2-AC	\$35.00			YES	NO	Served lobster year round	Broil/grill tail	
3-AMC	\$20 to \$30			YES		Serve whole tails for affordable prices.	Lobster meat	
4- BFF				YES	YES			YES
5-BFS				YES	YES			YES
6-BSCH				YES	YES			
4-BK	\$28 & \$20			YES		Menu based on customer's preference		Yes
7-BBC		YES			YES			Yes
8- BML		YES			YES			
9-BCC		YES			YES			
5-BC	\$15.95		YES				Meat only dishes	
6-BV	\$18		YES				Minced lobster	
7-BR	\$50			YES		Served throughout the year	2 broiled tails	Yes
8-BA								
9-BSK					YES			
10-BCH				YES	YES			
11-ABS		YES			YES			
12-CBW		YES			YES			
25-CBS		YES			YES			

26-CFM	\$60 & \$64			YES	YES		Grilled 10oz tail, thermadore	
27- CMT					YES		Broiled Lobster	
28-CFS	\$28 & \$21			YES			Grilled, cracked	
29-CAN	\$23.50		YES			Served throughout the year	Meat only dishes	
30-CAP					YES			
31-CPR	\$32.50		YES			Served throughout the year	Meat dishes	
32-CSR	\$18 avg			YES		Served throughout the year	Any dish	
33-CAR	\$50-60		YES			Serves 3 to 4 persons	Seafood platter (lobster meat)	
34-CCC		YES			YES			
35-CCY		YES			YES			
36-CPL	\$17		YES		NO		Minced	
37-CHC								
38-CHG	\$9 & \$13		YES		NO	Specialty is lobster meat dishes, seasonal based on availability	Lobster fry rice	NO
39-CMW					YES			
40-CPC			YES		NO	Seasonal	Lobster meat	NO
41-CCH					YES			
42-CTR	\$40			YES	NO	Lobster dishes served year round	Thermadore, cracked, grilled, steam	YES
43-COM				YES	YES	no tails served in closed season; price depends on market value, price is determined by chef upon order; during open season, chef prepares to customers' liking	Cracked lobster (in closed season)	YES
44-COR					YES			
45-COX								

46-CRK	\$19.50 & \$23.50		YES		YES	Served throughout the year	Salad, minced	
47-DOL								
48-DOR						Uncooperative		
49-DRA	\$24.95 avg			YES	NO	Price depends on market value- \$25 more or less	Lobster meat	
50-DDD	\$25			YES			Cracked/grilled	
51-DUN								
52-EVR	\$32 avg			YES		Served throughout the year	Broiled tail, meat dishes	
53-FIL			YES			Everyday lunch menu	Minced/salad	
54-FZB								
55-FSH	\$10		YES				Cracked, minced	
56-FCT				YES	NO	Price depends on market value; if he gets a good deal, this will be passed on to customers; purchase from small day- fishermen primarily; not sold every day for economic reasons	Broiled, steam, mince	NO
57-GOL	\$8 to \$13.95		YES				Meat only dishes	
58-GOR				YES	YES			
59-GCR		YES						
60-GOE	\$16		YES		NO		Meat only dishes	
61-GYL	\$55.70	YES			YES	Prepared to customers' liking	Tail dinner	
62-BUD	\$5.50 to \$13.95							
63-HRC	\$35 and up			YES	NO	depends on supply and market		NO
64-ICH	\$35	YES			YES			
65-IND	\$34	YES			YES			
66-LOR								

67-LUC	\$38 & \$45			YES	YES	Seasonal	Dishes vary with chef	NO
68-LCH	\$9.95 & \$13.95			YES			Steam lobster (minced)	
69-LIC	\$19.95			YES		Served throughout the year	Fried lobster meat	
70-LCC								
71-MAR								
72-MIK	\$7.25 & \$12.25		YES		NO	Served throughout the year	Meat only dishes	
73-MON	\$28.75			YES	YES	Served only in open season	Cracked, 8oz tail	
74-OFB					YES	Directed to website for menu-proved useless, will have to visit		
75-ORN				YES	YES	Menu varies		
76-OUT						Closed Temporarily		
77-PSM	\$15.99		YES		NO	Served in open season; not fresh in closed season	Seafood platter (lobster meat)	Yes
78-PFS								
79-PHO	\$7.25 to \$14		YES		NO	Served throughout the year	Meat only dishes	Yes
80-PNK				YES	YES	Served only in open season	Broiled, mince, salad; surf & turf	NO
81-PSC	\$25 & \$40	YES				Price depends on market value	Broiled 8-10oz; whole lobster	
82-PPD	\$46 & \$60 up	YES			YES	Price depends on market value	Broiled 8-10oz; whole lobster	
83-PSP	\$44 and up	YES			YES			
84-PRV	\$32 and up	YES			NO	Served only at dinner	Grilled 9oz tail	NO
86-RBW								
87-RIS								
88-RCK								

89-RSC	\$60 and up	YES			YES	Tails and whole lobster specialty		NO
90-SMY	\$12		YES			Available only in open season	Cracked lobster	NO
91-SND								
92-SFC								
93-SRB								
94-SSC	\$19		YES		NO	Served only on Wed, Thru, Fri; avail only in open season	Minced	Yes
95-SFR	\$62 & \$27			YES	YES		6oz tail, lobster salad	NO
97-SYP	\$13		YES			Available only in open season	Cracked lobster	
98-SDM	\$55					Available all thru open season and until supplies run out in closed season	2 tails broiled and cracked	
99-SMP								
100-SNA	\$10 & \$44			YES	NO	Entire menu online, high end gourmet	Bisque, cocktail; grill/broil; sauté	
101-SNL	\$5.50 to \$12.95		YES		NO	Served throughout the year	Meat dishes only	Yes
102-SNR	\$13		YES		NO	Served throughout the year	Lobster fettuccini	Yes
103-SPB		YES			YES			
104-SWI	\$15.99		YES				Lobster fettuccini	Yes
105-CEL								
106-GRP	\$36.75 & \$28.78			YES	YES	Served throughout the year	Grilled 8oz tail; cracked	yes
107-LND								
108-NNW	\$40				NO		6oz tail	
109-SZG	\$12, 13, 21		YES		NO	Served throughout the year	Grilled; mince; cracked; sautéed; pasta	Yes

110-VLT	\$10 to 15 & up		YES		NO		Pasta; grilled; baked; minced	
111-TPR								
112-TPR								
112-TPR	\$28 day \$32 night			YES		Served throughout the year	Minced only	Yes
113-TBR	\$20 & \$25			YES	YES	Available only in open season	Fried; grilled tail	NO
114-VAL		YES			YES			
115-VNB	\$36			YES	YES	Served throughout the year	Grilled 3 inch tail	Yes
116-VRS						Not co-operative in phone interview		
117-VGO								
118-VCR	\$29.95 & up			YES	NO	Served throughout the year	Assorted meat dishes	Yes

### APPENDIX 3: PHOTO LOG

**Photo 1: Undersized lobsters dumped in Abaco in 2009.** Bags of rotting lobster tails were found in Abaco. These lobster tails were caught by Bahamians and sold to a tourist. The report of inspections at the airport caused the tails to be dumped. There are several reports of undersized tails being sold at a “special” price to Bahamians on New Providence, and to visitors wishing to take lobsters back. Undersized lobster tails are easy to spot, and clearly illegal, thus pose a high risk to transport.



**Photo 2:** Everyone with access participates in the spiny lobster fishery as either a licensed commercial fisher or recreational fisher. With a growing population of Bahamians and visitors, the unreported recreational take of lobsters requires monitoring.



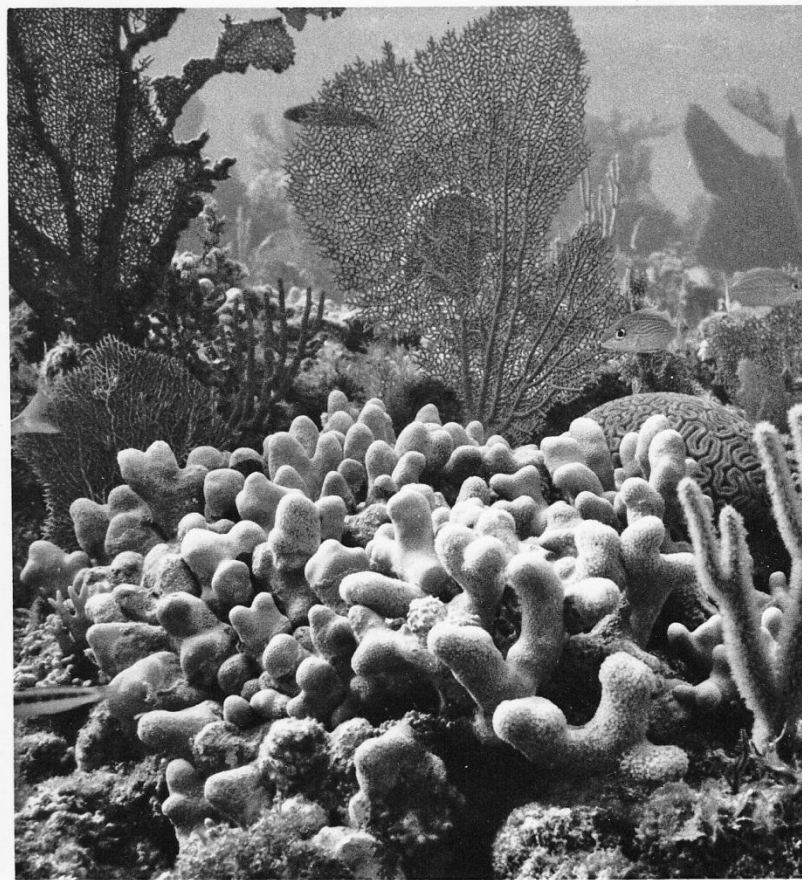
**Photo 3:** Lobsters are sold to processors in bags of tails. The tails are cleaned, and sorted by size by the processor. The Bahamas Marine Exporters Association (BMEA) has invested in maintaining a high quality export product, rejecting undersized tails from fishers.



**PHOTO 4:** Tropic Seafood Processing Room: Processing plant is closed during the closed season for spiny lobsters. Over the past ten years, the regulations on seafood export have made it very unlikely that IUU lobster makes it into the export market. New technologies allow for rapid sorting of lobster tails, and rejection of undersized tails returned to the fisher.



**PHOTO 5:** Clifton Reefs of the past: View of reefs off New Providence Island taken in 1963. These reefs do not exist today, having been removed for the construction of Clifton Pier and the power station. The destruction of coral reef resources not only by destructive fishing, but also by construction of harbours and marinas has drastically reduced the habitat for spiny lobsters. The loss of habitat coupled with the limited protection in Marine Protected Areas and national parks add to the challenges of sustaining the Bahamian lobster fishery



## APPENDIX 4: Survey of Restaurants serving Bahamian Lobster tails

### 1. BAHAMAS LOBSTER FISHERIES IMPROVEMENT PROJECT

We are conducting a short survey on the Bahamian lobster fishery and demand for lobster in The Bahamas. Your answers will help us evaluate your needs and the industry's ability to provide a sustainable lobster supply. Your candor is appreciated.

#### 1. Which best describes your business?

- ☐ Resort with restaurant
- ☐ Restaurant with tables
- ☐ Restaurant with tables and take away
- ☐ Retail foods
- ☐ Other

#### 2. Do you serve or sell Bahamian lobster tails or meat at your business?

- ☐ Yes
- ☐ No

#### 3. What lobster products do you sell?

- ☐ Frozen lobster tails
- ☐ Lobster tails as part of a meal
- ☐ Lobster meat
- ☐ Lobster meat as part of a dish
- ☐ Other (please specify)

#### 4. Do you sell Bahamian lobster products throughout the year or only during the Lobster season (August through March)?

- ☐ All year round
- ☐ Only August through March

#### 5. Please rank the following statements in terms of the relative importance of selling lobster to your business

	High	Medium	Low	Not significant
Consumer demand for lobster tails or meat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumer preference for Bahamian lobster	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumer preference for legal size lobster (>5oz)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**6. About how many lobster dinners / sales do you make per week?**

- ☐ less than 10 per week
- ☐ 10 to 100 per week
- ☐ hundreds per week
- ☐ thousands per week
- ☐ Don't know

**7. Where do you usually get your Bahamian lobster tails or meat for your business?**

- ☐ direct from a fisherman
- ☐ direct from a vendor
- ☐ from Tropic Seafood
- ☐ from J & J Seafood
- ☐ from Geneva Brass
- ☐ from Heritage Seafood
- ☐ Other (please specify)

**8. Are you satisfied with the price and quality of the Bahamian lobster tails and meat you purchased over the past year?**

- ☐ Very Satisfied
- ☐ Satisfied
- ☐ Dissatisfied
- ☐ Very Dissatisfied - there is a problem getting quality lobster at a good price

COMMENTS

**9. Are you concerned about the availability of illegal Bahamian lobster on the market**

- ☐ Yes, I often see illegal lobster on the market
- ☐ No, I rarely see illegal lobster on the market
- ☐ Don't know

**10. Do you have specific concerns about the Bahamian lobster fishery?**

**APPENDIX 5: Results from Resident and Recreational Fishers Survey:** 68 residents and yachting tourists that fish from New Providence (N= 27), Abaco (N = 10), Eleuthera (N = 8), Long Island (N = 8) Cat Island (N =2) and Exuma (N = 12).

		NUMBER OF TRIPS PER MONTH during the open season A = August to M = March								NUMBERS , SIZE AND METHODS OF FISHING IN 1 = YES, 0 = NO, Blank = no response					COMMENTS/ NOTES
LOCATTION	R = resident, T = non-Bahamian	A	S	O	N	D	J	F	M	TENS	Hundred	Summer Crab?	Undersized	Destructive Fishing?	
ABACO	R15	3	1	1	1					X		1	1		Fish the most at the start of the season with water is warm
ABACO	R16	2		1						X		0	1		Only go out with friends at the start of the season
ABACO	R17	1		1						X		1	0		have my own spots I check every year
ABACO	T03				1	1	1			X		0	0		I know when the closed season is
ABACO	T04		1			1	1	1		X		0	0		I am not in The Bahamas during the summer months
ABACO	T14		1	1	2	2	3	1		X		0	0		own a home in Abaco and fish all winter, go for lobsters when weather permits
ABACO	R40	1		1	2	2	1	1		X		0	0		Own a boat and like to go out whenever possible, dive lobsters when friends come up from Nassau
ABACO	R41	1								X		0	1	0	Too much work, would rather go sport fishing
ABACO	R42		1							X		0	0		only hook and line fish from land, do not fish for lobsters
ABACO	T05		2			2	2			X		0	0		
CAT ISLAND	R08	2	1				3	1			X	0	1	0	Lobsters are worth a lot of money, you can sell them to a restaurant or a visitor, this is cash we need
CAT ISLAND	R18	1		2	2	1	1			X		0	0		fish throughout the year for lobster
ELEUTHERA	R37	2			1	1				X					only hook and line fish from land, do not fish for lobsters
ELEUTHERA	R36	2								X					
ELEUTHERA	R38														only hook and line fish from land, do not fish for lobsters
ELEUTHERA	R39														only hook and line fish from land, do not fish for lobsters
ELEUTHERA	T15														only hook and line fish from land, do not fish for lobsters
ELEUTHERA	T16				1							0	0	0	only have dove once for lobsters
ELEUTHERA	T17		1		1	1				X			0		
ELEUTHERA	T18														only hook and line fish from land, do not fish for lobsters

EXUMA	R01	1	1							X		1	0	0	Fish with family when boat is available and time off from work
EXUMA	R02	2	1							X		1	0	0	
EXUMA	R03	2		1						X					fish at start of season
EXUMA	R04	1	1	1	1						X				Fish regularly when weather is good
EXUMA	R05	2								X					The economy is so bad now, I am living pay check to pay check, I never looked to sell fish and lobster before, but this is what I am doing when I can to make ends meet. I sold a wahoo last week, then a bunch of lobsters to some [second home owners], and that helped.
EXUMA	R19	1										0	0		have to get time off from work
EXUMA	R20														only hook and line fish from land, do not fish for lobsters
EXUMA	R21														only hook and line fish from land, do not fish for lobsters
EXUMA	T01					1	1	1	1		X	0	0		This is why I come to the Bahamas, to catch my own lobsters
EXUMA	T02					1	1	1		X		0			Only fish occasionally., there are many fewer lobsters and it is too much gas. Only fish in the cays, no fish in Elizabeth Harbour
EXUMA	T06		2			1	1			X		0	0		
EXUMA	T07		2				1	1	1	X		0	0		
LONG ISLD	R06	6	1	3							X	1	0	0	take vacation in August to fill up my freezer with lobster
LONG ISLD	R43									X			0		
LONG ISLD	R44			1						X			0		
LONG ISLD	R45	1		1						X		1	1		lobsters can replace themselves
LONG ISLD	R46	1								X			0		
LONG ISLD	R47	1	1							X			0		
LONG ISLD	T19		1	1	1	1	2			X			0		
LONG ISLD	R07	1	1		1					X			0		
NEW PROV	R10	1		1						X		0	1		
NEW PROV	R11	1								X		0	1		
NEW PROV	R12	1								X		0	0		
NEW PROV	R13	1	1							X		0	0		
NEW PROV	R14	1	1			1	1			X		0	0		
NEW PROV	T20	2	3	1							X	0	0		when I go fishing, I want to fill up my freezer (overnight trips sometimes)
NEW PROV	T21		1	1		1	1			X			0		

NEW PROV	T22	3	1	3	1						X		0		
NEW PROV	R22	2		1						X			0		
NEW PROV	R23	1								X			0		
NEW PROV	R24	1		1		1	1	1	1	X			1		
NEW PROV	R25	1	1					1	1	X			0		
NEW PROV	R26		1			1	1	1	1	X			1		
NEW PROV	R27		1			1	1			X			0		
NEW PROV	R28		1							X			0		
NEW PROV	T8	1				1	1			X		1	0		
NEW PROV	T9	1		1	1	1	2	2	1	X		0	0	0	
NEW PROV	T10		1		1	2				X		0	0	0	
NEW PROV	T11	1								X		0	0	0	
NEW PROV	T12	1								X		0	0	0	
NEW PROV	T13	1								X		0	0	0	
NEW PROV	R29														only hook and line fish from land, do not fish for lobsters
NEW PROV	R30														only hook and line fish from land, do not fish for lobsters
NEW PROV	R31														only hook and line fish from land, do not fish for lobsters
NEW PROV	R32														only hook and line fish from land, do not fish for lobsters
NEW PROV	R33														only hook and line fish from land, do not fish for lobsters
NEW PROV	R34														only hook and line fish from land, do not fish for lobsters
NEW PROV	R35														only hook and line fish from land, do not fish for lobsters

## **APPENDIX 6 COMMERICAL FISHERY ASSESSMENT – Supporting information**

Table A6.1: Number of active commercial fishers in The Bahamas based on records of lobster sales, and reports from the Fisher men Association (A. Laroda).

<b>ISLAND</b>	<b>APPROXIMATE NUMBER OF ACTIVE FISH</b>
<b>Grand Bahama</b>	<b>250</b>
<b>Spanish Wells</b>	<b>310</b>
<b>Abacos</b>	<b>200</b>
<b>New Providence</b>	<b>300</b>
<b>Long Island</b>	<b>70</b>
<b>Exumas</b>	<b>50</b>
<b>Aklins-Crooked Island</b>	<b>30</b>
<b>Andros</b>	<b>100</b>
<b>TOTAL</b>	<b>1,010</b>

## DEFENCE FORCE APPREHENDS DOMINICAN, HAITIAN NATIONALS

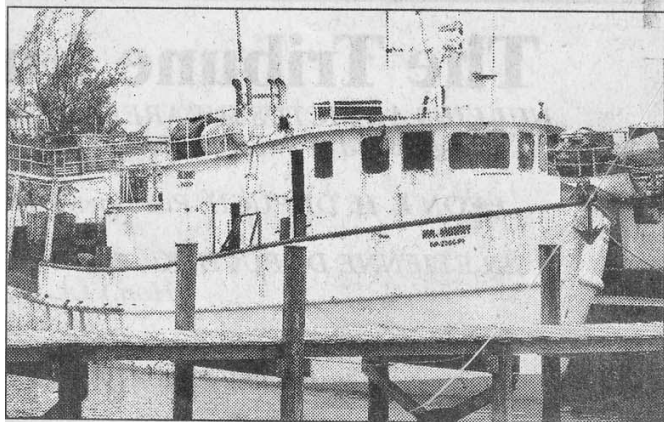
THE ROYAL BAHAMAS DEFENCE FORCE detained Dominican nationals yesterday after their boat was suspected of illegal fishing in Bahamian waters (right and far right).

The Defence Force also detained Haitian nationals after their boat sank in Bahamian waters (below and below right).

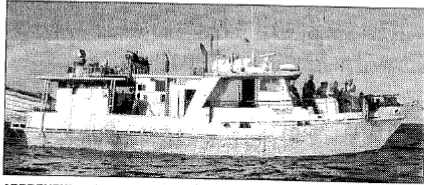
**Felipé Major/Tribune staff**



THURSDAY, APRIL 14, 2011, PAGE 3



## RBDF concerned about evidence of increased poaching in Bahamas



**APPREHENDED:** A Dominican registered fishing vessel after it was apprehended for poaching in Bahamian waters.

WITH two large groups of foreign nationals apprehended for illegal fishing within days of each other, the Royal Bahamas Defence Force said it is concerned about the increased incidence of poaching in Bahamian waters.

The latest group to be caught fishing illegally consisted of 22 Dominicans who were arrested about 46 nautical miles south-south-east of South Andros and brought into the Coral Harbour Base shortly after 9am yesterday.

The United States Coast Guard Cutter *Farallon* - with a member of the Defence Force working under the Ship Rider Agreement - intercepted a 56ft Dominican registered vessel named "Mr Jesse" engaged in illegal fishing activity last Wednesday shortly after 5pm. The fishing vessel, which had 22 Dominican fishermen onboard and a large quantity of spiny lobster and scaled fish, was turned over to Her Majesty's Bahamian Ship Nassau and taken to the Coral Harbour Base.

The foreign fishermen and their catch were handed over to the relevant authorities for further processing.

On Saturday, April 9, another group of 22 Dominicans was arrested 23 miles west of Ragged Island. These men have since been charged in the courts.

The Defence Force said it remains concerned about the volume of reports that they have been receiving concerning the increase of poachers in Bahamian waters and maintains

but level headed." Mr Turnquest and business

successful locations in terms of customer volume.

Photo courtesy of HMBS Nassau

**FOR 3 IN 1 LAWN SERVICE**  
Fertilizer, Fungicide,  
Pest Control  
Tropical Exterminators  
322-2157

**Castrol**

"QUOTE OF THE DAY"

Distributed By  
**BAY STREET GARAGE**  
Dowdeswell Street  
322-2434 • 322-2082

"It's never wise to skimp on car care. For how much you depend on your vehicle - use only the best. Use Castrol!"

**Easter**  
**SALE! Savings**  
**20% OFF All Easter**  
\* while supplies last **Bunnies**

- Easter Grass \$1.50 up
- 12 Plastic Eggs \$1.99 up
- Basket Bags 10 for \$7.50
- Easter Baskets \$2.50 up
- Egg Colouring Kits \$1.99 up
- Lots of Easter Toys
- Easter Lillies and Calla Lillies
- Bunnies and Chicks (Small to Large)

*Fabrics, Crafts and Inspiration*

**Home Fabrics**

Madeira St. [242] 325-8233 • Robinson Rd. [242] 322-3080 • Fax: [242] 322-5251 • [www.homefabricsltd.com](http://www.homefabricsltd.com)



**TOSHIBA**

lower payment!

INTERFUNCTION COPIERS

