

The 2018 Economic Impact of Flats Fishing in The Bahamas



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The 2018 Economic Impact of Flats Fishing in The Bahamas

Introduction

For over a decade flats fishing in The Islands of The Bahamas has been receiving increased attention as its value to the country's economy has grown. Girded by an economic assessment by Fedler (2010) that showed flats fishing anglers spent nearly \$70 million directly in the Bahamian economy and S\$141 million when secondary effects were included, the flats fishing industry, non-governmental organizations, and the Bahamian government have been moving forward to improve management of flats-dependent fish species and their habitats throughout the islands. This project builds on the 2010 economic study to assess economic activity associated with flats fishing in 2018.

Currently, the Bahamas Ministry of Tourism (BMOT) does not publish data on the number of tourists engaging in flats fishing by island or country wide. The BMOT has estimated the percentage of stopover visitors engaged in "bonefishing" in some of their visitor surveys during the past decade. On average, between 2010 and 2016 about 4.2% of stopover tourists visiting The Bahamas reported engaging in bonefishing. In 2016, the last year data is available, about 4% or 59,000 of the 1,482,000 stopover visitors spent one or more days fishing for bonefish. How bonefish anglers are distributed across the many islands of The Bahamas is another question.

The BMOT has periodically produced and published visitor activity participation by island over the past decade. Bonefishing participation data is available relatively consistently for the major islands of Grand Bahama, New Providence and the Out Islands as a group where survey sample sizes have been large enough to reliably estimate participation. Estimates for most of the Out Islands individually are much more problematic.

An interesting study by Maycock (2015) used an economic impact methodology developed by Southwick Associates (2014) to estimate the contribution of flats fishing to the Bahamian economy. This study used a blend of BMOT visitor arrivals and "bonefishing" activity participation, and an online survey of self-identified Bahamian flats anglers to estimate angler total expenditures and jobs. Maycock's study encountered the same limitations as the Fedler (2010) economic study in that estimating flats angler numbers, days of fishing, and angler expenditures was challenging. In general, Maycock used BMOT 2015 visitor arrivals by air multiplied by the percentage of visitors reporting having gone recreational fishing on the BMOT *Tour Operator and Media Exit Survey* to estimate the total number of angling visitors. This total included all types of recreational fishing such as flats, reef and offshore.

To estimate flats anglers, Maycock (2015) multiplied the number of 2015 Bahamas stopover visitors from BMOT data (1,155,762) by the percentage of respondents to the BMOT *Tour Operator and Media Exit Survey* (4.4%) to yield 50,852 flats anglers. Upon further scrutiny of this data, this number of flats anglers is very likely to be inflated by tourist arrivals in Nassau. In

2015 Nassau stopover visitors totaled 717,069 and the percentage of these visitors that went “bonefishing” during their visit was 2.4%. This results in 17,210 bonefish anglers fishing around New Providence Island. This far exceeds expectations as there were no fishing lodges and less than five flats guides providing service on New Providence. Further, there are very few flats that do-it-yourself (DIY) anglers can access from shore. The most likely explanation for inflated New Providence flats anglers lies in the BMOT survey methodology. Most anglers are passing through Nassau on their way to one of the Out Islands. BMOT visitor arrival data does not reflect destination islands but “first port of entry” which includes many, roughly 40-50%, who are traveling on to Out Island destinations. Using the data from these two data sources appears to substantially overestimate the number of flats anglers.

The online survey used by Maycock (2015) to collect Bahamian angler characteristic and expenditure data provided some useful insights about flats anglers. The methodology used for this survey involved sending a survey invitation to U.S. anglers on known angler lists and as a link on a dedicated recreational fishing Facebook page. This process generated 522 usable surveys from anglers fishing in The Bahamas within the previous 12 months. It should be noted that this was a convenience sample of anglers as no attempt was made to identify a population of anglers and randomly select respondents within that population. Thus, results of the study may not accurately reflect characteristics of the total population of Bahamian flats anglers.

Among the findings of the survey, three statistics are notable. First, 90% of the respondents reported they came to the Bahamas specifically to go fishing and that they would not have traveled to The Bahamas if there were impediments that prevented them from fishing for the species they wanted to target. From an economic impact perspective, this is an important finding because it supports allocating all trip expenditures to flats fishing impacts. It also underscores the importance of conservation efforts that maintain healthy fisheries in The Bahamas. If habitats and fisheries decline, anglers would likely choose other destinations for their international fishing activity.

Second, Maycock’s online survey found that flats anglers spent about \$4,608 during their fishing trip in The Bahamas. In this study, anglers provided trip expenditure information for 17 categories of purchases. This is nearly identical to an estimate of \$4,605 made by Fedler (2018) as part of a flats fishing market analysis study for the Bahamas Vocational and Training Institute. In this latter study, Fedler used data from the BMOT’s 2016 *Visitor Expenditure Survey* to calculate trip expenditures for 69 individual items across five categories: food and lodging, recreational activities, retail purchases, transportation, and services.

This project builds on the original economic impact study by Fedler (2010) and overcomes some of its limitations by incorporating improved estimates of guided and unguided angler numbers and by using BMOT *Visitor Expenditure Survey* data to improve angler trip expenditure estimates. These improvements not only will more accurately reflect the annual number of flats anglers fishing during 2018, they will offer improved estimates of angler expenditures and total economic output.

Project Objectives

1. To estimate the number of active and inactive guides in The Bahamas.
2. To estimate the number of guided and unguided (DIY) flats anglers in The Bahamas.
3. To estimate the direct expenditure impacts made by flats anglers in island economies.
4. To estimate the total economic output of flats angler direct expenditures.

METHODS AND PROCEDURES

To estimate the economic impact of flats fishing in The Bahamas, two types of data are needed – the number of anglers traveling to The Bahamas to fish for bonefish and other flats-related species and the expenditures these anglers made in The Bahamas during their fishing trips. Estimating flats fishing anglers in The Bahamas has been problematic in past research efforts. While the BMOT has tracked and published bonefish angling participation by visitors since 2010, this data has been presented for a few of the most popular fishing destinations like Abaco, Andros, and Grand Bahama islands. Flats fishing on the smaller islands like Mayaguana, San Salvador and Great Inagua do not appear in the data. Typically, only data for New Providence and Grand Bahama are presented in BMOT data.

Fishing Lodge Survey

The alternative used to overcome the limitation of the BMOT survey data was to contact fishing lodges and independent guides on each island in-person, via e-mail, or by telephone to collect information on the number of fishing days and number of anglers serviced by each lodge or independent guide. A list of fishing lodges and other lodging facilities was compiled from the original list developed by Fedler (2010) and expanded through internet searches and referrals from fishing lodge managers.

During discussions, lodge managers were asked to provide fishing days and angler numbers for the 2018 fishing season. Lodge managers were also asked for the names of their staff and contract (independent) guides. Staff guides are those employed by lodges to service the daily fishing needs of guests and do little, if any, independent guiding. This process eliminated staff guides from being contacted in the independent guide survey directly since their days on the water and number of anglers serviced were accounted for in the fishing lodge totals. Staff guides were added to the guide database and noted as a “staff guide” to avoid contact in the guide survey. Further, lodge managers were asked to identify any other fishing lodges on their island and contact information if available. Any new operations were added to the fishing lodge database for follow-up.

Additionally, lodge managers were asked if they knew of other independent guides in the area, whether they were still guiding, and their guiding activity level. When possible, managers rated independent guide activity level, in a relative manner, as (1) lower than average, (2)

average, and (3) higher than average. This categorization was used to estimate guide days and angler numbers for non-responding guides in the independent guide survey. Lodges that did not respond to either a telephone call or e-mail request or both were noted as non-responding. No estimate of the amount of fishing business conducted by the non-responding lodges was made for this study. Thus, only responding lodges were included in the study.

Independent Guide Survey

A similar process for data collection was used when contacting independent guides. Independent guides are guides who contract directly with anglers to service visiting angler needs. They often receive referrals from hotels and B&Bs, and other businesses to meet visiting angler requests. A fishing guide database was compiled from the original 2010 study list, membership lists for the Bahamas Fly Fishing Industry Association and Abaco Fly Fishing Guides Association, and referrals from guides and lodge managers contacted during the project. Guides were interviewed in-person or sent an e-mail request for needed information when an e-mail address was available. Other guides on the list were called by telephone. If a response was not received after three e-mail contacts, at least three attempts were made to contact the guide by telephone. As with lodge managers, when independent guides were contacted, they were asked to identify other guides and provide their contact information for inclusion in the study. We also noted whether a guide was retired, no longer guiding, or deceased and eliminated them from the list of active guides.

Unguided Angler Estimation

Many anglers travel to The Bahamas to fish on their own without a fishing guide. They often stay at hotels, bed and breakfasts, or cottages and seek out fishing locations on their own or from local sources. These unguided anglers generally spend the same number of days on an island as guided anglers. Since there was interest in understanding the economic impact of both guided and unguided flats fishing in The Bahamas, a procedure was developed to estimate unguided anglers. This calculation involved using data from the BMOT's *Visitor Expenditure Survey* (VES) and lodge and guide surveys in a three-step process.

The first step involved calculating the annual number of total flats anglers for each island. This procedure involved multiplying the number of 2018 Stopover Visitors for each island by the percentage of visitors engaging in the activity of "bonefishing". The result was the total number of anglers visiting the island during 2018. The percentage of visitors engaging in bonefishing was derived from 2016 Visitor Expenditure Survey data, the latest participation data published by the BMOT. Participation data were available for the entire Bahamas and for the individual islands of Abaco, Andros, Bimini, Eleuthera, Exuma, Grand Bahama, and San Salvador. Either full or partial data from 2010 to 2016 were available depending on the island. Where data were available for 2016, it was used. When 2016 data were not available, data from all available years from 2010 to 2016 were averaged and used in the calculation. For islands where bonefishing participation data were unavailable, such as Crooked Island, Mayaguana and the Berry Islands, an average participation rate for Eleuthera, Exuma, San Salvador and Bimini was

substituted. The second step in estimating unguided anglers involved summing the number of fishing lodge and independently guided anglers to produce the total number of guided anglers for each island from the two respective surveys. The final step is a simple subtraction of total guided anglers (Step 2) from total anglers in Step 1. Given the data available to estimate all flats anglers in The Bahamas, this was the only reasonable procedure available for including unguided anglers into the economic impact assessment process. It is important to note that this process excludes anglers that travel to The Bahamas by private airplane or private boat. There are no BMOT data that would allow us to estimate the number of flats anglers arriving by these two modes. From our discussions with fishing lodge managers and guides, this number would be quite low.

Visitor Expenditure Survey

The following is a brief summary of the methods involved in collecting data and estimating angler expenditures from the 2016 VES as presented in the Fedler (2018) marketing report. The VES is an on-going exit survey of stopover visitors in The Bahamas. Upon leaving the country, visitors are asked to complete a comprehensive questionnaire recording their travel party expenditures while in the country. Stopover visitors make up the overwhelming portion of all visitor expenditures. The VES questionnaire covers most possible expenditures such as accommodations, meals, transportation, recreational activities, and other goods and services. Investment expenditures, such as real estate, are excluded. Also recorded in the questionnaire are stopover visitor characteristics of home country, number in travel party by age group, number of times the respondent has been to The Bahamas, whether the stopover visit was inspired by a previous cruise ship visit and recreational activities engaged in during their visit.

Respondents reported their trip expenditures for 69 individual products and services in eleven categories: meals, lodging, nature activities, scuba diving or snorkeling, other water sports, fishing, other recreational activities, popular visitor purchases, transportation, retail purchases, and services. Mean trip purchases for anglers were calculated for each item and multiplied by total anglers to produce total trip expenditures. To differentiate between guided and unguided anglers, those purchasing guided or charter fishing services were classified as “guided” anglers.

Economic Multipliers

Anglers traveling to The Bahamas to fish for bonefish and other flats species contribute to the Bahamian economy in two important ways. Some anglers hire independent guides and purchase lodging, meals, equipment, supplies, transportation, and other items separately. Others pay a “package price” to a fishing lodge which normally includes guided fishing, lodging, meals, and transportation in The Bahamas. Both independent fishing guides and fishing lodges generate income and jobs for The Bahamas.

Estimating the total economic impact of flats fishing entails quantifying the relevant direct expenditures by fishermen and the “multiplier” or secondary effects related to these direct expenditures. Total economic impact is comprised of three components: direct effects, indirect effects and induced effects. **Direct Effects** are the on-site or immediate expenditures such as lodging, fishing tackle, meals, guide fees and taxes. **Indirect Effects** refer to the increase in economic activity that occurs when a contractor, vendor or manufacturer receives payment for goods or services and in turn can pay others who support their business. This includes payments to bankers, accountants, grocery store owners, marina operators, fuel suppliers and others. **Induced Effects** are changes in spending patterns that are caused by the increased wealth and income of those persons directly and indirectly employed by fishing lodges, hotels, or as independent fishing guides. This includes spending on food, clothing, housing or transportation by those directly or indirectly employed by the fishing-related businesses, including retail sales, medical services, insurance services, and much more. These Indirect and Induced Effects together are often referred to as **Total Output** which is represented by a “multiplier” that is applied to direct expenditures (Direct Effects) to yield **Total Output**.

Estimating Total Output from expenditures by anglers in The Bahamas is difficult in the absence of economic input-output models developed from extensive econometric studies specifically for The Bahamas. These types of studies have been performed in other countries to assess the economic effects of government policies, changes in economic activity, and private sector development. In many countries, these values have been estimated using modeling programs such as IMPLAN (Minnesota IMPAN Group 2007) and RIMS II (Bureau of Economic Analysis 1997).

Leakages

One of the biggest factors determining how big a multiplier is for a country or region is the concept known as “leakages”. Leakages happen when money leaves an economy and cannot impact other sectors or employees anymore. For example, when a resort must purchase food from outside the country, the funds used to buy the food “leak” out of the country and no longer benefit businesses and workers within the country. Leakages tend to be higher and, thus, multipliers are lower in countries and regions that import a large percentage of supplies and services. This is common among nations within the Caribbean region. The greater the leakages, the lower the multiplier and vice-versa (Southwick et al. 2014).

Given the unavailability of such models for The Bahamas government, an output multiplier was obtained from the World Travel and Tourism Council (WTTC 2019) economic statistics for The Bahamas. The WTTC collects and tracks government tourism and economic statistics from most countries around the world. Data from their annual compendium of tourism statistics provides tourism expenditures and total tourism output for each country. Dividing total output for tourism by tourism expenditures yields the output multiplier needed for this study. From the *2019 Bahamas Annual Research: Key Highlights*, publication we calculated the output multiplier for 2018 to be 1.27. That is, for every dollar spent by tourists in the Bahamian economy, an additional 27 cents in indirect spending occurred.

RESULTS

Stopover Visitors

The Islands of The Bahamas is a popular destination for tourists, particularly from the United States. Over 85% of the 1.5 million visitor arrivals (Table 1) in 2018 were Americans. Much of the tourist activity is centered in Nassau, however, well over one-third of these visitors travel through Nassau to the Out Islands for more relaxing and natural experiences, including flats fishing. While some bonefishing is available around the island of New Providence, most of the flats fishing takes place in the Out Islands. According to the Bahamas Ministry of Tourism (BMOT), on Andros Island, for example, about half of the visitors are involved in flats fishing. Flats fishing on other islands varies widely but averages about 11% of stopover visitors. For the Bahamas as a country, about 2.2% of visitors (Table 2) pursue flats fishing (BMOT 2016). If this is the case, then about 34,300 anglers visit The Bahamas to fish for flats species each year.

Table 1: 2018 stopover visitor airline arrivals by island

Island	Arrivals
Nassau/Paradise Island	1,168,372
Grand Bahama	74,479
Abaco	119,352
Andros	11,396
Berry Islands	8,833
Bimini	27,305
Cat Cay	4,637
Cat Island	1,067
Eleuthera	56,876
Exuma	62,123
Inagua	247
Long Island	1,383
San Salvador	17,142
Total	1,553,212

Documentation for how the data in Table 1 were calculated is not available from the BMOT, but it appears there may be some double counting of visitors occurring. An angler arriving on an international flight in Nassau is counted as an arrival for Nassau. However, that angler most often transfers to a domestic flight to stay and fish on one of the Out Islands, where he or she is counted again as an arrival on that island. This has significant impacts for estimating flats anglers. For example, the percentage of stopover visitors engaging in flats fishing around New Providence Island was estimated at about 2%. If this was the case, there would be an estimated 23,000 flats anglers visiting the island during 2018, well over half of all anglers visiting The Bahamas. This is not believable because there are only three independent guides on the island

and no fishing lodges to provide the level of service to accommodate this number of anglers, and insufficient flats habitat available for this much fishing effort.

The percentage of stopover visitors participating in flats fishing on the remaining islands (Table 2), where data is available, is likely to be more realistic as this data does not appear to

Table 2: Percentage of stopover visitors engaging in flats fishing by island and year

Island	2010	2011	2012	2013	2014	2015	2016	Average
All Bahamas	4.1%	4.2%	4.4%	5.0%	4.0%	4.0%	4.0%	4.2%
New Providence	2.4%	2.5%	2.4%	3.0%	2.0%	2.0%	2.0%	2.3%
Grand Bahama	3.1%	2.8%	3.4%	4.0%	3.0%	3.0%	2.0%	3.0%
Out Islands	11.7%	11.4%	12.5%	10.0%	12.0%	12.0%	11.0%	11.5%
Abaco	9.0%	7.0%	8.0%	8.0%	8.0%	n/a	n/a	8.0%
Andros	39.0%	40.0%	53.0%	45.0%	40.0%	n/a	56.0%	45.5%
Eleuthera	11.0%	11.0%	10.0%	12.0%	14.0%	n/a	n/a	11.6%
Exuma	7.0%	7.0%	5.0%	7.0%	5.0%	8.0%	n/a	6.5%
San Salvador	1.0%	n/a	2.0%	1.0%	n/a	n/a	n/a	1.3%
Bimini	n/a	n/a	11.0%	8.0%	n/a	n/a	n/a	9.5%

suffer from duplicate counting. However, given the absence of information on the methodology employed for calculating stopover visitors and how bonefishing angler numbers are collected and extrapolated to estimate totals, these data should be used only to track general trends and not to calculate exact numbers.

Because of the limitations of the BMOT data, we modified Fedler's (2010) approach for estimating flats fishing angler numbers. The procedures for estimating flats anglers at fishing lodges and those serviced by independent guides were consistent with the earlier study. This involved contacting lodges and independent guides directly to collect guided anglers and fishing days data. Through personal or telephone interview, or e-mail correspondence, lodge managers were asked to provide the names of all staff guides that were employed by the lodge. These names were coded on the overall list of guides as staff guides in order to isolate independent guides. Guides that were contracted on a daily or as-needed basis by lodges were coded as independent guides as they may work for multiple lodges and/or have their own personal guiding business. Each lodge manager was also asked to identify any independent guides in their locale. This information was used to confirm guides already on the guide list for the island or to add a new guide to the active independent guides database for the island. In addition to the identifying staff and independent guides, lodge managers were asked to provide the number of anglers and number of guided fishing days they provided during the 2018 fishing season.

Fishing Lodge Database

Table 3 provides a summary of the number of lodges identified for each island, the number of lodges contacted and the number of lodges providing information for the study. The lodge inventory started with the list generated during the 2010 study and was supplemented with new information based on internet searches, BMOT lodging information for each island, and information acquired when interviewing lodge managers. A total of 98 lodging establishments were identified as potential fishing lodges throughout The Bahamas. However, not all lodging establishments were fishing lodges. When contacted, several lodges were guest houses or hotels that offered fishing services to their guests but did not employ staff guides. They either contracted with independent guides to provide service or referred customers to a list of local independent guides. Overall, 68 establishments qualified as a fishing lodge. Nearly half were located on Andros and Abaco Islands. Managers at each of the 68 establishments were contacted and asked to provide information for the study. Nearly three-fourths of the lodges provided information. Among non-responding lodges, some were not operating during 2018 due to storm repairs or changes in ownership. A few managers refused to provide the business data needed for the study, although most of these managers did provide information on independent guides and the names of other lodges on their island.

Table 3: Fishing Lodge Survey Response

Island	Lodges				
	Potential Fishing Lodges	Qualified as Fishing Lodge	Percent	Provided Information	% Response of Qualified
Abaco	14	12	85.7%	9	75.0%
Acklins Island	6	4	66.7%	2	50.0%
Andros	23	19	82.6%	13	68.4%
Berry Islands & Bimini	6	4	66.7%	2	50.0%
Cat Island	3	1	33.3%	1	100.0%
Chub Cay	1	0	0.0%	0	0.0%
Crooked Island	6	4	66.7%	3	75.0%
Eleuthera	3	2	66.7%	2	100.0%
Exuma	8	4	50.0%	3	75.0%
Grand Bahama	6	5	83.3%	5	100.0%
Great Inagua	1	1	100.0%	1	100.0%
Long Island	9	7	77.8%	7	100.0%
Mayaguana	5	2	40.0%	1	50.0%
New Providence	0	0	0.0%	0	0.0%
Ragged Islands	1	0	0.0%	0	0.0%
San Salvador & Rum Cay	6	3	50.0%	1	33.3%
Total	98	68	69.4%	50	73.5%

Independent Guide Database

The independent guide survey list also had its origins in Fedler's (2010) study. This initial list was supplemented with membership lists from the Bahamas Fly Fishing Industry Association, the Abaco Guides Association, Internet searches, and referrals from other guides and lodges as noted above. The initial list of 360 potential guides (Table 4) was reduced over the course of the study by learning that some guides were deceased, others retired, and still others had quit the guiding business to pursue other employment options. At the conclusion of the study 245 active guides were identified.

Attempts were made to contact each of the active guides by telephone, in-person, or by e-mail. About 72% of the active guides provided information for the study. Nearly two-thirds of the active independent guides were concentrated on Abaco, Andros and Grand Bahama islands. Further, 70% of the responding independent guides were from these three islands.

Table 4: Independent Guide Survey Response

Island	Independent Guides			Active Guides	
	Potential Guide	Active	Percent	Provided Information	% Response of Active
Abaco	72	52	72.2%	44	84.6%
Acklins Island	18	11	61.1%	8	72.7%
Andros	118	71	60.2%	45	63.4%
Berry Islands & Bimini	11	6	54.5%	3	50.0%
Cat Island	7	5	54.5%	2	40.0%
Chub Cay	9	6	66.7%	2	33.3%
Crooked Island	14	8	57.1%	5	62.5%
Eleuthera	26	19	73.1%	12	63.2%
Exuma	13	10	76.9%	7	70.0%
Grand Bahama	42	37	88.1%	35	94.6%
Great Inagua	2	2	100.0%	1	50.0%
Long Island	18	12	66.7%	10	83.3%
Mayaguana	3	2	66.7%	1	50.0%
New Providence	3	2	66.7%	1	50.0%
Ragged Islands	1	0	0.0%	0	0.0%
San Salvador & Rum Cay	3	2	66.7%	1	50.0%
Total	360	245	68.1%	177	72.2%

Lodge Manager Survey

The purpose of the lodge manager survey was to estimate the number of anglers serviced throughout The Bahamas by fishing lodges. Information provided by these managers was aggregated for each island. Because of the absence of fishing lodges, as we have defined them in this study, on many of the smaller islands, annual angler estimates for these islands were aggregated into a combined category entitled “Other Out Islands” consisting of eight islands. This helps protect the confidentiality of business information provided by lodge managers.

As shown in Table 5, fishing lodges throughout The Bahamas serviced about 9,300 anglers. Abaco lodges hosted 3,100 anglers during 2018 with Andros lodges providing fishing experiences to 2,900 anglers. A significant number of anglers also fish from lodges on Grand Bahama. There are very few lodges, and thus few lodge anglers, on the remaining islands in The Bahamas.

Table 5: Number of fishing lodge, independent guide and unguided anglers by island

Island	Anglers			
	Fishing Lodge	Independent Guide	Unguided	Total
Andros	2,926	3,266	1,865	8,057
Abaco	3,109	2,465	1,967	7,541
Eleuthera	635	2,409	914	3,958
Grand Bahama	2,142	550	521	3,213
Long Island	493	1,070	529	2,092
Acklins Island	0	900	293	1,193
New Providence	0	684	71	755
Other Out Islands (8)	43	2,558	1,356	3,957
Total	9,348	14,085	7,899	31,332

Source: BMOT 2019.

Independent Guide Survey

To calculate the total number of anglers booking trips with independent guides it was necessary to estimate the number of anglers for guides not providing data for the study, either through lack of contact or refusal to provide data. To provide some structure to this process, we used “days guiding” for independent guides from data collected from responding guides. The intent was to be able to place non-responding guides into one of the three guiding activity groups shown in Table 6. We examined the distribution of days guiding from the study which showed a preponderance of guides spent 50 or fewer days (Low Group) guiding clients. The remaining guides were evenly split between the Medium and High groups.

Table 6: Annual days fishing for classifying non-responding independent guides

Fishing Days Groups	N	Percent	Guided Fishing Days		
			Mean	Median	Range
Low	94	53	22	20	1-50
Medium	42	24	75	75	51-100
High	41	23	150	140	101-300

When interviewing an independent guide for the study, we asked them for the number of days guiding and the number of anglers they fished with during the 2018 fishing season. Additionally, each guide was asked to provide the names and contact numbers for other independent guides in their area and an assessment as to which of the three groups their guiding activity would likely fall into. The range of days for each group was provided to the respondent to choose. The estimate was noted in case the referenced guide could not be contacted. In many cases we were able to receive two or three such estimates for many guides. If the referenced guide was contacted later, the information provided was recorded for that guide. However, if the referenced guide could not be contacted, the median guided fishing days value for the that guide was entered based on the assessment by the guide or guides providing the estimate. We found that these estimates of guiding activity by other guides were relatively accurate when compared to the actual number provided by a specific guide. Further, in general discussions with independent guides, they were familiar with how often other guides work as these discussions among guides often take place at the boat ramp or in other social settings where they congregate.

Bahamian independent guides provided flats fishing experiences for 14,000 anglers during 2018 (Table 5). It is not surprising that Andros had the largest number of anglers fishing with independent guides. Nearly 30% of all Bahamian independent guides reside on Andros. Similar numbers of flats anglers hire independent guides on Abaco and Eleuthera islands. There are few independent guides on Grand Bahama as most guides are affiliated with a fishing lodge.

Estimating Unguided Anglers

The greatest challenge in this study was to find a reasonable way to estimate Unguided Anglers or Do-It-Yourself (DIY) anglers. These anglers travel to The Bahamas specifically to fish or fish for a day or more as part of a broader vacation. Unguided anglers take advantage of the wadeable flats accessible from shoreline roads, or by canoe, kayak or rental boat. The estimation process involved calculating the total number of flats anglers based on visitor arrivals in Table 1 and the percentage of visitors engaging in flats fishing in Table 2. Visitor arrival numbers for 2018 were adjusted to eliminate the duplicate counting of visitors passing through Nassau airport while traveling to a destination in one of the Out Islands. This process resulted in a visitor total of 783,300 unduplicated visitors. Total visitors were then multiplied by

4% (the percentage of visitors engaging in flats fishing) to produce an estimated total number of flats anglers of 31,332 (see Table 5).

Total anglers for each of the seven principal fishing islands in Table 5 were estimated using a combination of visitor arrivals (Table 1) and the percentage of visitors engaging in flats fishing for the island (Table 2). Adjustments were made in the distribution formula to account for the disproportionately large percentage of visitors to Andros that fished (56%) and the subsequent reduction in the percentage of visitors fishing in other Out Islands (i.e. downward from 11% in Table 2). The number of Unguided Anglers was calculated by taking the total number of anglers for each island (shown in Table 5) and subtracting Fishing Lodge and Independent Guide anglers. While this is not a perfect method of estimating Unguided Anglers, it is a reasonable and systematic procedure for estimating this group of anglers and significantly improves on the method used in the Fedler (2010) study which did not have the BMOT flats fishing data available at the time.

Almost half of the unguided flats fishing in The Bahamas occurs on Andros and Abaco islands (Table 5). Fewer than a thousand unguided anglers fish Eleuthera and fewer yet travel to other Out Islands to fish.

Flats Angler Expenditures

The Ministry of Tourism periodically collects visitor expenditure data through their Bahamas *Visitor Expenditure Survey* (VES). The most recent survey was conducted in 2016. This survey collected visitor expenditures on 69 products and services travelers are likely to purchase during their stay. Mean trip expenditures were calculated for each product and service for Guided Anglers and Unguided Anglers. The Guided Angler category in Table 6 included both Fishing Lodge and Independent Guide anglers as there was no variable in the dataset that could reliably be used to differentiate the two types of anglers. Guided anglers were identified by the presence of guided or charter boat expenditures.

The 69 expenditure items from the VES were collapsed into 11 categories for presentation in this study (Table 7). The primary reason for aggregating these items was that many anglers purchased only a few of the items during their visit to The Bahamas. As shown in the bottom row of the table, Guided Anglers spend about \$1,400 more during their trips than Unguided Anglers. The primary differences were in the amounts spent for lodging and those related to fishing. Guided Anglers spent about \$1,000 more for lodging and \$400 more for their fishing expenditures. The difference in fishing expenditures reflects payments for guided fishing experiences.

It is important to note that flats anglers spend money on a variety of non-fishing related items. While lodging, meals and fishing expenditures comprise 74% of Guided Angler and 60% of Unguided Angler expenditures, anglers still spent significant amounts on other outdoor recreation-related items as well as commercial products.

Table 7: Mean and total trip expenditures by flats anglers (US dollars)

Expenditure Items	Guided Anglers		Unguided Anglers		All Anglers	
	Mean	Total	Mean	Total	Mean	Total
Lodging	\$2,173	\$50,919,909	\$1,134	\$8,957,466	\$1,631	\$59,877,375
Meals	\$705	\$16,520,265	\$662	\$5,229,138	\$592	\$21,749,403
Nature activity	\$35	\$820,155	\$58	\$458,142	\$35	\$1,278,297
Diving or snorkeling	\$69	\$1,616,877	\$88	\$695,112	\$63	\$2,311,989
Other water sports	\$6	\$140,598	\$17	\$134,283	\$7	\$274,881
Fishing	\$512	\$11,997,696	\$143	\$1,129,557	\$358	\$13,127,253
Other activities	\$84	\$1,968,372	\$77	\$608,223	\$70	\$2,576,595
Popular purchases	\$213	\$4,991,229	\$202	\$1,595,598	\$179	\$6,586,827
Transportation	\$373	\$8,740,509	\$454	\$3,586,146	\$336	\$12,326,655
Retail purchases	\$394	\$9,232,602	\$339	\$2,677,761	\$324	\$11,910,363
Service expenditures	\$42	\$984,186	\$37	\$292,263	\$35	\$1,276,449
Total	\$4,606	\$107,932,398	\$3,211	\$25,363,689	\$3,631	\$133,296,087

Finally, it should be pointed out that anglers spend substantially more during their trips to fish The Bahamas than do non-fishing visitors. Non-fishing visitors spend an average of \$1,560 during their trips, while Unguided Anglers spend twice as much and Guided Anglers three times as much as general tourists. These expenditure differences are particularly meaningful as all three groups have an average stay of 6.2 to 6.4 nights in The Bahamas, which is not a statistically significant difference.

Flats Fishing Economic Impact

Total trip expenditures were calculated separately for Fishing Lodge, Independent Guide and Unguided angler groups (Table 8) to estimate the economic impact of flats fishing in The Bahamas. To make these calculations, total anglers for each group (Table 5) was multiplied by the respective average trip expenditure (\$4,606 for Fishing Lodge and Independent Guide anglers and \$3,211 for Unguided anglers) in Table 7. The results in Table 8 show that all flats anglers spent an estimated \$133 million in The Bahamas during 2018. About half of these expenditures (\$65 million) were made by anglers fishing with Independent Guides. Fishing Lodge angler expenditures accounted for one-third of overall impact (\$43 million), while Unguided anglers added about 20% to the economic impact (\$25 million).

Half of all flats angler expenditures were attributable to those fishing on Andros and Abaco islands (Table 8). Anglers fishing Eleuthera and Grand Bahama islands combined for 23% of overall expenditures. Flats anglers on these four islands account for nearly three-fourths of all flats fishing expenditures in The Bahamas. Anglers in the eight Out Island group contributed nearly 14% to the overall economic impact of flats fishing.

Table 8: Angler expenditures by island and angler type (US dollars)

Island	Fishing Lodge	Independent Guides	Unguided	Total
Andros	\$13,477,156	\$15,043,196	\$5,988,515	\$34,508,867
Abaco	\$14,320,054	\$11,353,790	\$6,316,037	\$31,989,881
Eleuthera	\$2,924,810	\$11,095,854	\$2,934,854	\$16,955,518
Grand Bahama	\$9,866,052	\$2,533,300	\$1,672,931	\$14,072,283
Long Island	\$2,270,758	\$4,928,420	\$1,698,619	\$8,897,797
Acklins Island	\$0	\$4,145,400	\$940,823	\$5,086,223
New Providence	\$0	\$3,150,504	\$227,981	\$3,378,485
Other Out Islands (8)	\$198,058	\$12,625,046	\$5,583,929	\$18,407,033
Total	\$43,056,888	\$64,875,510	\$25,363,689	\$133,296,087

Multiplier Effect

Economic impact assessments are designed to capture the flow of money from anglers to businesses and workers. In The Bahamas, this process involves anglers paying for lodging, meals, guides, and many other goods and services as noted above. In turn, the recipients of angler expenditures, such as lodges, hotels, guides, and other businesses, then spend their money on supplies, fuel, and employees to support their businesses. This process keeps repeating and is accounted for in the economic impact assessment process by using “multipliers”. Multipliers capture the additional spending that is stimulated by angler expenditures in the Bahamian economy. For example, a revenue multiplier of 1.27 suggests that for every \$1.00 spent on an activity, such as flats fishing, generates a total of \$1.27 in total revenue; that is, for every dollar spent by anglers, an additional 27 cents in revenue is generated as the initial dollar changes hands to employees and suppliers. The combination of angler expenditures and multiplier effects is referred to as Total Output.

Because the Bahamas is highly dependent on foreign sources for much of its food, building materials, fuel, transportation and other products, the country’s multiplier of 1.27 is relatively low compared to developed countries where these coefficients can approach or exceed 2.0. Accounting for the multiplier effect, Total Output from angler expenditures in The Bahamas exceeded an estimated \$169 million (Table 9). Since the output multiplier is a constant across all three of the angler groups, the proportions of Total Output are the same as for expenditures; 49% for Independent Guides, 32% for Fishing Lodges and 19% for Unguided anglers.

Table 9: Total flats angler expenditures, total output and jobs by angler type (US dollars)

Angler Group	Total Expenditures	Total Output	FTE Jobs
Fishing Lodge	\$43,056,888	\$54,682,248	2,511
Independent Guides	\$64,875,510	\$82,391,898	3,784
Unguided	\$25,363,689	\$32,211,885	1,479
Total	\$133,296,087	\$169,286,031	7,774

DISCUSSION AND CONCLUSIONS

Recreational fishing is one of the most popular outdoor activities among visitors to The Bahamas. A large part of fishing occurs in the clear waters and exceptional scenery of the flats surrounding each of the islands. During 2018, an estimated 23,400 anglers were guided on the Bahamian flats by over 250 lodge and independent guides. Another 7,900 anglers used their own initiative to find accessible flats to pursue bonefish.

Flats fishing generates \$169 million in total economic benefits to the Bahamian economy annually. These angling visitors spent nearly \$133 million directly in island economies and supported the equivalent of 7,800 full-time jobs from those direct expenditures. Further, flats anglers spend over twice as much per visit than non-anglers. This makes anglers very desirable visitors.

The contribution of flats fishing to individual island tourism economies varied widely. It ranged from 80% of the Andros tourism expenditures to less than 1% of the tourism expenditures on New Providence Island. Overall, flats fishing accounted for slightly more than 7% of tourist expenditures throughout The Bahamas in 2018. This percentage grows to 13% when only the Out Islands are considered.

These economic impacts of flats fishing should be attributed entirely to The Bahamas. As the Maycock (2016) study of flats anglers in The Bahamas showed, over 90% of the anglers surveyed reported that they would not have traveled to the islands if they were unable to fish. Similarly, MOT visitor surveys have consistently found that the 80% or more of anglers in the survey said fishing was the primary reason for choosing The Bahamas. Any changes to fishing access or decline in the quality of fishing would likely have a direct impact on anglers decisions to choose The Bahamas as a fishing destination.

Flats fishing in The Bahamas offers a variety of experiences for anglers. The most visible and heavily marketed is the inclusive fishing lodge alternative. Other anglers, however, seek a more “do-it-yourself” approach by booking their own lodging and guides, and using local food service options to meet their needs. This alternative requires that adequate lodging facilities and food service (grocery stores and restaurants) are near fishing opportunities. It also requires a minimum number of guides and a sustainable flow of visitors to ensure long-term business success. Clearly, business development plans throughout the Out Islands need to tie all aspects of the tourism visitor base together to ensure sustainability guided and unguided fishing opportunities.

The unguided recreational fishery in The Bahamas also plays an important role in many small island economies. These anglers directly support the small independent businesses that provide lodging, food, transportation and other services throughout the islands. Unguided anglers often spend a few days fishing and additional time sightseeing or engaging in other nature-related activities, further extending the tourism benefits on the island. While these anglers may occasionally use guides during their visits, unguided anglers are generally restricted

to a few flats that have shoreline access near their lodging. While this may be viewed as competition by some guide businesses, unguided fishing does play a significant role in many island economies and should be recognized for doing so, particularly where few, if any, guides are available.

Two trends in the Bahamian flats fishing industry are particularly noteworthy. First, both fishing lodge managers and independent guides are feeling the effects of the aging U.S. population. Several of the smaller lodge managers or owners were concerned that their long-time customers were booking fewer days per year, were no longer physically capable of fishing, or were deceased. While this trend was concerning both personally and from a business standpoint, these managers and owners pointed out that these older customers were not being replaced by younger anglers. Further, these small lodge owners and managers indicated that they did not have the skills and connections to effectively market their business to begin attracting younger anglers. Several independent guides that had been guiding the same anglers for years reported the same trend. Their business had been declining for several years because many of their long-time clients were unable to travel and fish as they had in earlier years. These guides were frustrated because they did not have the tools or expertise to market their business and attract new customers.

The second trend points to a different set of problems. In general, most lodges and independent guides have recovered from the recession at the end of the last decade. However, several fishing lodges and other accommodations went out of business because of the recession or the recession coupled with hurricane losses. As a result, several long-time independent guides have retired or are employed in other business sectors. Further, many older guides plan to retire soon with no provision for the recruitment or training of new guides. This situation is particularly concerning on many of the smaller islands with limited facilities and few guides.

Fishing quality is a concern raised by many guides and lodge owners providing fishing information for this study. Their concern focused on both the perception of The Bahamas as a premier bonefishing destination and the ability of Bahamian fisheries resources to maintain existing catch rates. There are many facets to maintaining existing catch rates. First is the issue of continually pressured fish which become “educated” to anglers and thus become like many other bonefish destinations where enticing fish to bite becomes a highly technical matter and catch rates decline. Second, there is concern that large resort developments will dramatically increase the pressure on fisheries habitats and bonefish population. Combined, these may cause the capacity of the fishery to be exceeded, resulting in a less-appealing destination for anglers.

Habitat loss and degradation are also concerns. For example, mangrove destruction, soil erosion and channelization all were noted by guides and lodge managers as growing concerns.

Further concerns range from the impacts on water quality from waste disposal and runoff to fisheries habitat destruction from development. On this latter point, several examples were

pointed to where resort construction cleared dozens of acres of mangrove forest and filled some wetlands areas before the venture closed, leaving the area partially or fully denuded and erosion problems for others to contend with. The promise of these large developments quickly turned to environmental and social concern for residents.

The Bahamas competes with other Caribbean and Central American countries for flats fishing anglers from the United States and around the world. These other countries are beginning to recognize the economic benefits of flats fishing and the low impact it has on local fisheries resources. As a result, these countries are giving increased attention to marketing their fishing opportunities by focusing on aspects of flats fishing experiences unique to their countries. In Belize, for example, the government recently passed catch-and-release only protection for bonefish, permit and tarpon. The fishing industry there is actively using this new legislation to underscore the country's commitment to conservation and the protection of these valuable species. Further, when relations between the U.S. and Cuba are normalized, an additional destination for American anglers will be added to the mix of flats fishing opportunities in the region.

To remain competitive in this very discriminating and competitive market, The Bahamas will need to ensure that the quality of the flats fishing products available remain competitive with those in other countries. This means that the perceived value of flats fishing in The Bahamas is at least equal to or exceeds those in other countries. The flats fishing industry in The Bahamas should begin identifying the unique qualities of their fishery and determining which of these characteristics differentiate The Bahamas from other fishing destinations. This would allow guides, fishing lodge owners, resorts and government to use these unique characteristics to strengthen the bonefishing brand in The Bahamas and ensure that the economic benefits continue to grow.

An important tool that The Bahamas government has in its toolbox to ensure a sustainable and economically valuable flats fishery is habitat conservation. Recent and ongoing research shows that bonefish have small home ranges, migrate long distances to spawn, gather in Pre-Spawning Aggregations in nearshore areas away from the flats, and spawn at night in offshore waters. Habitat conservation that ensures healthy habitats for home ranges, spawning migration pathways, pre-spawning sites, and offshore spawning, is an investment in this economically valuable fishery by The Bahamas government. Indeed, the economic value of the flats fishery can be sustained **in perpetuity** with proper investment in habitat conservation.

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