



Measuring the Economic Contributions of Recreational Fisheries: A How-To Manual

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For:



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WECAFC/OSPESCA/CRFM/CFMC Working Group on Recreational Fisheries
Economic Impact Assessment Manual

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Preface

This manual represents a difficult task of packaging many years of economic training and experience into a simple manual that can be used by fisheries managers to reasonably estimate the economic impacts from recreational fishing within their country. As best as possible, technical terms have been avoided. When necessary, important and complex terms are explained in the easiest forms possible. As often as possible, rather than spending too much time explaining complex issues such as ‘response bias’, the manual leads users thru processes that minimize such problems, often without the user necessarily being aware of having taken steps to avoid a complex issue. By avoiding lengthy discussions about various technical issues, and simply taking users through steps that reduce these problems, the authors and the supporting Working Group think this manual will receive greater use and be less demanding on its users.

This manual is intended to help countries within the wider Caribbean Region better understand the size and contributions from recreation fishing to their economies. The methods proposed within can be applied to other countries outside this region, too. The results are meant to explain the economic impacts at the national and regional level, not to the individual. Measures of recreational fishing’s impacts upon individuals are a valid concern, and may represent a second or separate effort on the part of the countries using this document.

The authors and members of the Working Group strongly encourage users to consider the sustainability of their fisheries resources. Developing and promoting recreational fisheries in places where current or increased fishing pressure is not sustainable will lead to dire effects for local marine resources and for the people who depend on local marine resources for food and support. It is vital that any efforts related to measuring and developing recreational fisheries are complimented by policies and efforts ensuring sustainable practices within all fisheries.

Introduction

Background

While many tourists and residents participate in recreational fishing throughout the Caribbean region, little is known about the economic importance of the sector. As a result of this information gap, recreational fisheries are not widely considered in development and management decisions by governments in the region.

This manual lays out a simple method for countries to assess the level of expenditures and associated economic impacts related to recreational fishing. Assessing the economic impacts of any activity can be complex. Most economists engaged in such practices have years of training and hands-on practical experience. Considering the complexity associated with economic studies, this manual provides a simplified methodology that can be employed by non-economists. To ensure the results are not misleading, users are encouraged to engage, when possible, an experienced economist to review all efforts and results. People applying this manual are expected to have some analytical abilities, survey research experience and knowledge of the region to be examined. If complexities arise that cannot be addressed by this manual, it would be beneficial to consult economists experienced with recreational fisheries and/or the economy in the region being studied.

The definition of recreational fishing can vary from place to place. The presence of people who fish for food, but enjoy their fishing activities, can confuse the definition of fishing, as can anglers who sell their catch to help reduce their expenses. The definition of anglers as presented in the FAO's *Technical Guidelines for Responsible Fisheries* is adopted by this manual. This definition is presented in the *Glossary of Terms and Definitions* later in this manual.

Purpose and Objectives

This manual provides a step-by-step process for estimating angler expenditures and using those expenditures to estimate the economic impacts within the region of study. The manual can be used to measure the returns from just tournaments, freshwater or saltwater fishing, or all types of fishing within an area. The results will report the amount of money spent by resident and non-resident anglers, and the economic effects on other sectors of the economy as anglers' money flows between businesses and workers. Results will be reported in GDP contributions, jobs, income, retail sales and sometimes tax revenues. Specific objectives of this manual are to a) increase awareness and understanding among decision makers and the general public about the economic importance of recreational fisheries to their countries and b) to help fisheries managers contribute to public policy discussions affecting fisheries management, conservation and economic policy.

Manual's Organization

The plan of this report is as follows. Section I, provides a brief introduction to economic impact analyses and the associated concepts. Section II provides step-by-step instructions on how to conduct a survey on expenditures related to recreational fishing and to use survey results to assess economic impacts of recreational fisheries. This manual explains common problems, information needs and other issues to be considered during the assessment study. When questions or problems arise, the authors may be contacted for assistance.¹

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Section I. Background to Economic Impacts and Similar Concepts

What Do Economic Impact Studies Tell Us?

Economic impact studies are commonly used to determine the contributions of an activity such as recreational fishing, to a regional or national economy. The idea behind these studies is that the significance of an activity is bigger than the activity itself. That is, the total economic impact captures the revenue, jobs and income directly related to recreational fishing PLUS the impacts generated as angler dollars flow through the economy, benefitting many economic sectors such as restaurants, transportation, lodging and more.

Most economic impact studies focus on three to four core indicators: revenue or retail sales, employment (full and part-time jobs), income (jobs, salaries, rents and business profits) and output which is also known as the total economic activity resulting from anglers' original expenditures. An activity that does not generate revenue or economic activity, support jobs or provide income does not have an economic impact. Such activities that are not bought or sold, such as the satisfaction someone receives from time with friends, for example, still have a value.² While important, due to its complexity and difficulty to measure, the concept of non-market or economic valuations will not be discussed further in this manual.

“New Money”

In its strictest interpretation, economic impact studies measure the amount of revenue, jobs and income that would be lost if an activity were no longer available. In the case of recreational fishing, the impact is “what would be lost” if recreational fishing did not exist. To meet this standard, economic impact assessments often focus on “new money”—thought of as the new revenue that recreational fishing brings into a country or region. Along with attracting new money, fishing may capture dollars that—in its absence—would have otherwise been spent elsewhere in the economy. For example, if fishing were no longer possible, many resident anglers would spend their dollars on boating, golf or other activities. Residents would still be spending locally and the economy would not suffer much by the loss of resident fishing activities. These anglers' monies were simply moved from one activity to another.

In recreational fishing economic impact studies, visitor (tourist) spending is included as part of the economic impact, while not all of the expenditures made by local residents are included. To count the impacts of locals' spending, we need to know if all of their spending would have occurred if the activity did not exist. This might be the case if local residents would have left the region to fish elsewhere. If locals claim that an activity

² Economic value” is separate concept than economic impacts. Economic value essentially measures the increase in an individual's or community's well-being as result of using a product, or engaging in a new practice or policy - or not engaging. This concept is best used to allocate fisheries across competing users, or to measure if an individual's quality of life is improved. Jobs, sales, tax receipts and GDP are best used to help explain the size or significance of an activity to a community, such as recreational fishing.

helps keep them in the region, their expenditures can be counted as a form of “new money” and are important to the nation’s growth and economic health.

Because it is often difficult to know if local residents’ spending truly represents new money, economists make a distinction between economic “impact” and “contribution”:

Economic contribution is a broader concept and counts all spending related to an activity such as recreational fishing, both new money brought into a country or region by visitors and resident spending.

Economic impact only reports new money and the impacts generated by new money.

Multiplier Effect:

The basic concept underlying economic impact assessments is that money flows between businesses and workers. For example, fishing tackle retailers and charterboat captains who are paid by anglers spend their money on new supplies, fuel and employees; the businesses and people that received this money then spend it on other businesses and employees, and the process keeps repeating. Overall, anglers’ spending has a total impact that exceeds the amount originally spent by anglers. “Multipliers” explain this impact. For example, a revenue multiplier of 1.4 suggests that every \$1.00 of spending on an activity generates a total of \$1.40 in revenue; that is, the “initial” \$1.00 spent by an angler along with an additional \$0.40 in economic activity created elsewhere in the regional economy as the angler’s \$1.00 changed hands between local businesses and their workers.

Economists often make a distinction between two types of impacts: indirect and induced. Indirect impacts occur when businesses spend anglers’ monies, and induced impacts occur when employees of these businesses spend their paychecks.

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 any more. For example, when a resort has to purchase food from outside the country, the funds used to buy the food “leaks” out of the country and no longer benefits 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.

Social Issues, Angler Motivations and Marketing Considerations

In addition to economic information, it may be useful to also measure the social impacts of recreational fisheries, i.e. the effect fishing has on social fabric of the community and well-being or livelihoods of individuals and families. Social impact information often relates to local participation in recreational fishing, people’s well-being, employment and income, culture, traditions and knowledge, human relationships, and how people interact

with their environment. If any of these issues are important, you may want to add questions to your survey to help explain to others how recreational fishing interacts with your community.

Other common social issues relate to anglers' satisfaction rates and perception of recreational fishing's quality and benefits. These types of questions are also considered by many to provide important marketing insights. The results can be useful to help identify how to improve your fisheries to help attract more anglers in a sustainable fashion, and how to better market and advertise your fishing opportunities to attract more anglers, if that is a goal. Examples of these marketing questions are included in the surveys in the annexes.

In the Caribbean region the following social indicators may be of use:

Indicator	What to measure/data to collect	Source of data/information
1. Visitors to the area/country	<ul style="list-style-type: none"> - Annual number of tourists - Number of overnight stays 	<ul style="list-style-type: none"> - International visitors surveys - Tourism surveys
3. Cultural/sports events	<ul style="list-style-type: none"> - Number of recreational/game fish tournaments and participation 	<ul style="list-style-type: none"> - Sportfishing and angler associations - Business associations - Fishing tackle retailers
4. Contribution of recreational fisheries to resource management/conservation	<ul style="list-style-type: none"> - Guidelines/regulations for catch-and-release, bag limits, fishing gears and methods - Collecting and reporting of recreational fisheries data and statistics - Participation in co-management and policy/decision making 	<ul style="list-style-type: none"> - Fisheries yearbooks and statistics - Fisheries annual reports, policies and management plans
5. Food/nutrition security of the population	<ul style="list-style-type: none"> - Fish landed/harvested - Fish donated to hospitals, schools, for special celebrations, awareness raising among youth etc. 	<ul style="list-style-type: none"> - Fisheries statistical yearbook - Reports of game fish/angling associations
6. Add to number of tourism / Visitors potential activities in an area	<ul style="list-style-type: none"> - Choices for tourists/ variety of activities 	<ul style="list-style-type: none"> - Visitor surveys
7. Use of license fees/permits/taxes of recreational fisheries operators for infrastructure/maintenance of facilities	<ul style="list-style-type: none"> - State of infrastructure and maintenance received. 	<ul style="list-style-type: none"> - Government tax reports

Not all indicators above are suitable for all circumstances. You determine which issues are important to your region, and which questions to add to the survey, if any.

Bringing It All Together and Making Decisions:

By now, it is apparent that the two main components of a recreational fishing economic assessment are a) the amount of money spent by anglers, and b) the nation's economic multipliers. Expenditures are often obtained through angler surveys, while multipliers are generated by large-scale models of the economy developed by specialized studies and typically funded by governments or research institutions. This manual, will provide guidance on how to survey anglers in a country or region, and also presents multipliers along. Multipliers are typically available for explaining employment (full and/or part-time jobs), income (salaries, wages, rents and business profits), tax revenues and total economic activity resulting from recreational fishing or other activities.

Users of this manual will need to make decisions about the best way to measure the economic impact or contribution of recreational fishing. Such decisions include the best methods available to survey anglers about their expenditures, the multipliers that best represent their region or nation, and if they need to include spending by residents. Decisions will be driven by the requirements of the policy- and decision makers and the objectives of the planned study. These decisions should be made on a case-by-case basis.

Other methodologies are available to assess the economics associated with recreational fishing. The method presented in this manual is relatively simple and replicable by general practitioners.

Section II. Conducting an Economic Impact Analysis: Step by Step

Before beginning, it is very important to read this entire manual to understand the process you are about to engage. Then, use the check list below to track your progress. Within this section, you will find details and explanations for each task listed below. Some ‘tasks’ in the spreadsheet are not actual tasks, but are important notes to review to help ensure your analysis is accurate. For easy reference, the rest of the manual corresponds with the numbers assigned to each step in this check sheet.

Project Check List

	Complete?
1. Select Your Project Team	—
2. Define Your Study’s Overall Goals and Objectives	—
3. Develop Your Objectives and Plan Tasks:	
3.1 Identify Your Target Group:	—
3.2 Identify Existing Data Sources:	—
3.3 Determine Which Information to Collect and Report	—
4. Collect Data	
4.1. Determine the Number of Anglers in Your Target Group:	—
4.2. Design Your Survey	
4.2.1. How Many People Will You Need To Survey?	
4.2.2. Selecting the Survey That Best Fits Your Needs and Resources:	—
4.2.3 Is a Hybrid Survey Your Best Option?	—
4.2.4 Review this note about collecting quality data	—
4.2.5 Selecting Which Anglers to Survey:	—
4.3 Construct the Questionnaire	
4.3.1 Expenditure Categories to Collect	
4.3.1.1 Travel Expenditures:	—
4.3.1.2 Equipment and Non-Travel Expenditures:	—
4.3.2 Identify How Many Anglers Were Served Per Expenditure	—
4.3.3 Total Trip Days vs. Total Days of Fishing	—
4.4 Fielding Your Survey	
4.4.1 Pre-Test Your Survey!	—
5 Data Entry	—
6 Develop Estimates of Angler Expenditures	—
7 Estimate the Total Economic Impact of Recreational Fishing	—
8 Post-Analysis Stage: Be Sure to Communicate the Results	—

1. Select Your Project Team

Your project will only succeed if you have the right people involved! You cannot do this alone. It is critical to enlist help from the recreational fishing community. Even if a contractor is hired to do this project, help from community leaders is absolutely vital. Securing help from the recreational fishing and tourism community may be the most important task in your project. You will have two types of people involved in your project: 1) project team members and 2) analysts. Select these two groups before you begin your economic assessment:

Project team members are individuals from the tourism and recreational fisheries community who will provide the resources you must have to complete your study. The people and organizations who can help you are those who will also benefit from your final results. These agencies and organizations frequently include:

- Fishing or business organizations who also need to explain how important fishing is to the region's economy. These people can provide access to anglers within marinas and other closed areas, help identify funding, encourage other businesses to assist, and help encourage anglers to participate in your surveys;
- Media and community leaders, including elected officials: these people can help identify funding sources, recruit businesses to participate, help grant access to restricted areas such as marinas and airports to administer surveys, and help promote the results once the study is completed.

Lessons received from this manual's testing phase showed it is critical to have people from the recreational fishing and tourism communities supporting you or your contractor. Plus, time is needed to build trust with recreational fishing businesses and win their support in collecting necessary data. Expect several months to build these relationships. To win support from these people, be sure to explain why the study is being conducted, and how the results will benefit them and the community. You may need to first win support from one or two leaders in the tourism and recreational fishing community and then have these people help you recruit others who have access to anglers and business leaders.

Members of your project team will help identify the information needed from this project to help address recreational fishing, tourism, economic and conservation issues within in your country or region. In some cases, members of the project team can provide information on the number of anglers (from their own projects and sources) and help secure access to anglers or locations where angler surveys can be conducted. If available, an economist familiar with your country's economy and tourism would be very helpful. Be sure to bring in the groups and organizations needed to provide the insights and support necessary to complete all tasks listed in this manual.

The information you ultimately produce will not be valuable unless it is shared with decision makers, policy officials and the public. Therefore, when your project is complete, you will need access to people who can provide the results to agencies, organizations and businesses that need to know the results. Many of these people will already be project team members described above, but you may want to consider adding

others to the team. These people will be able to help identify key information you should develop if you are to effectively help improve fisheries management and tourism in your country. They should be recruited and involved in the beginning of the project, not at the end. Make sure they have a say in your efforts if you want their help in communicating the final results.

Most project team members are not expected to be actively involved in the day-to-day operations of the study, but should familiarize themselves with this manual and the process you are about to engage.

The second audience, analysts, includes all individuals who will carry out the study. These individuals will assist the project manager and team members. Analysts, who should also be members of the Project Team, will develop the questionnaire and assist with the logistics of data collection, including interviewing anglers if in-person surveys are used (versus online, mail and other types of surveys). Analysts will enter the survey data into a computer program, perform basic calculations (e.g., average values) using a spreadsheet, and estimate the multiplier effects using the economic impact assessment tool (described below). Often, you might have need for expert analysts to assist with your survey design and survey activities. The author can assist in locating experts when needed. If you have access to survey experts experienced with surveys within your region, try to secure their help or recommendations.

Analysts should start by reading through the entire manual very carefully to understand the “big picture” of the project and how the various parts fit together. Plus, analysts should use the manual and the checklist provided earlier as a step-by-step guide for conducting the impact assessment.

Enough details are provided in this report, as well as sample questionnaires from studies conducted by The Billfish Foundation and Southwick Associates in Costa Rica and Panama (Appendix A), so that many tourism and fisheries agencies/organizations should be able to carry out economic assessments using existing staff. If the project team decides to contract expert analysts to collect the data, the details provided in the how-to manual can help the project team and consultants to develop common expectations for the study.

2. Define Your Study’s Overall Goals

Be sure to work with your project team to develop a clear description of what your project intends to accomplish, the types of information needed to accomplish your goal(s), and the basic tasks you will use to reach your goals. If the target group is non-residents, a goal might be “to examine the impact of visiting anglers on jobs, income, and overall economic activity in the country.” Similar goal statements can be developed for projects that target all anglers, or focus on slightly different indicators. Given the almost universal interest in jobs, the employment impact of recreational fishing is likely to be included in the goal statement of most projects.

Your objectives, which are the specific tasks you will accomplish to successfully complete the economic assessment, are developed in the next section. Without clearly

defined goals and objectives, it is very easy to end up with a very long, complex survey that fails to reach your goals.

If you are not sure how to separate recreational anglers from commercial, artisanal and/or subsistence fishers, please refer to the definition of recreational fishing provided by the FAO in the *Glossary of Terms and Definitions* later in this manual.

3. Develop Your Objectives and Plan Tasks:

The pre-analysis stage is crucially important to the overall success of the project, as well as the acceptance of study findings when the analysis is completed.

3.1 Identify Your Target Group:

The target group could include non-resident anglers, either freshwater or saltwater anglers, all anglers, people who fish in a particular region, or even those involved in specific types of fishing such as tournaments or billfishing. You or your project team must decide on the target group early in the process because it influences how the rest of the study is designed and conducted. Think of the factors that created the need for your study, or what you want to accomplish with the results of your study, when determining who is included in your target group.

This task is closely related to the task of assembling your project team and often takes place at the same time. This is because the target group for analysis determines the relevant stakeholders, while the stakeholder organizations can provide input into the exact scope of the project. It is prudent to discuss the target group and project goals with each prospective project team member before they commit to joining.

The most common decision made when selecting the target group is whether to focus on non-resident anglers (i.e., tourists) or all anglers, including locals. A key advantage of focusing on non-resident anglers is that they are typically easier to reach in the data collection stage. In many regions, visiting anglers can be found when they are departing the country at airports, cruise ship terminals and other transportation hubs. Also, visiting anglers might be more apt to use the Internet—both general tourism and fishing-specific websites—when planning their trip. A challenge faced when examining ALL anglers in your country or region is the difficulty associated with estimating their numbers. Some strategies to help overcome this challenge, such as enlisting angler organizations or charterboat operators, are discussed in the section on data collection.

A second advantage of focusing on non-resident anglers is that their spending can be more readily interpreted as “new money” coming into the country/region. As discussed further in this handbook, often much of the monies spent by local residents on fishing would still be spent within your study region even if fishing was not possible, this minimizing any economic loss.

The advantages and disadvantages of including resident anglers in your assessment include:

Advantages of including residents:	Disadvantages include:
Residents are often a major part of your fishing community.	Including residents can significantly increase the cost of your assessment
Resident anglers help build and support a local fishing culture, which might be a factor in attracting non-residents.	In some places, residents can be scattered, and can be difficult to contact to complete surveys.
Including residents can allow for comparisons between locals and tourists.	Residents' fishing preferences and methods can vary more than non-residents, requiring more complex surveys.
Results can help you determine how anglers will react to proposed new regulations or if proposed regulations need to be modified.	Many residents' expenditures would have been spent within the region, even if the person could not fish. Including residents' expenditures can overstate the true new contributions from fishing.

The ultimate decision on whether to focus on non-residents or all anglers requires a consideration of the costs and ease of acquiring data for the target group, study goals and objectives, whether or not the study is about economic impact (“new money” only) or economic contribution, and the desire to compare the attitudes of resident and non-resident anglers. Other decisions that are commonly made when selecting the target group are whether to focus on marine as well as freshwater fisheries, the choice of species to include in the study, and whether to conduct assessments for specific places within the country.

In most cases, a focus on marine, or saltwater, fishing is appropriate given the limited amount of freshwater recreational fishing in many nations throughout the Caribbean region. To produce an economic impact assessment with the broadest possible audience, it is advisable to include all species of fish that are caught in the region. An important survey question will ask anglers to select the specific species they pursued and caught. With this information, the impact assessment can be conducted for an individual species of fish (e.g., marlin, sailfish, tuna, etc.), as well as identifying the types of species most important to your recreational fishing and tourism economy. Likewise, if the survey asks anglers to indicate the exact places where they fished, the analysis can help you identify how to improve or at least protect those places and services critical to your nation’s recreational fishing and tourism economy.

3.2. Identify Existing Data Sources:

The less data you need to produce from a survey, the better off you are. Shorter surveys receive better responses from anglers, and existing surveys and data sources may have greater accuracy than the survey you are about to conduct. Your tourism agency may

conduct visitor surveys. If this is the case, an influential member of the agency serving on your project team may be able to help include a few fishing-related questions on the next survey conducted by the tourism agency. Although this option might limit the amount of information that is collected, a general tourism survey that asks how many times and where people fished along with related expenditures could provide all the information that is needed for a basic economic impact assessment of non-resident anglers. Similarly, some fisheries agencies or other organizations may conduct their own surveys or be able to assist in reaching the target group.³

Tourism/recreational fishing businesses and industry associations are worth having on your project team. These groups may have lists of customers/members, which could be used to identify potential survey respondents. Or, these groups can distribute your survey to anglers for you, whether it's a paper-based survey or a link to an online survey. If a group does not want to provide a mailing list of names and addresses, even aggregate figures such as the percentages of resident and non-resident customers/members can be very helpful.

3.3. Determine Which Information to Collect and Report:

Once the target group and existing data are identified, the final step of the pre-analysis stage is to determine the data that needs to be collected. Be sure the project team has agreed to the study's goals by this point.

The types of information that are needed to estimate the economic impacts of recreational fishing include:

- An accurate count of anglers in the target group,
- The number of days fished per angler, and
- The amount of spending per day related to recreational fishing.

These three categories of information, to be discussed later in more detail, are crucial to any economic impact assessment. If these figures are available from reliable sources, the project can proceed without a survey. If a survey is required to collect expenditure and other fishing-related data, which is usually the case, the project team can decide whether to include additional questions about angler attitudes and opinions. The project team will have to balance the value gained from the extra questions added to a survey versus having fewer surveys. Longer surveys often result in fewer being completed.

4. Collect Data

4.1. Determine the Number of Anglers in Your Target Group:

Your first step in the data collection and analysis stage is to determine the number of individuals in your target group. Reliable counts of anglers are crucial for determining how much anglers spend in your country. This information can be calculated several

³ If a government agency works primarily with commercial fisheries, they might be less able to assist with reaching the target population, but—depending on the organization—their perspective could be useful to the project.

ways and, because of its importance to the study, it is often worth the effort of obtaining more than one estimate. If the angler counts are similar, they can help build confidence about the accuracy of the study. If they are substantially different, the two estimates can be used as end points (i.e., minimum and maximum) for reporting a range of impacts. Likewise, obtaining two very different estimates can help uncover problem related to data collection and analysis.⁴

Try to avoid common data problems. If you obtain different data that have conflicting estimates of the number of anglers in your area, let your project team decide which data is the most reliable and accurate. Please note that it is common for people to critique economic studies. Therefore, when deciding which numbers are best to use, the project team must consider the reliability of the estimates and their sources, and which estimates can be adequately defended or not.

As discussed earlier in the manual, project team members representing tourism or fisheries agencies and organizations might have access to information on the number of non-resident anglers, or the percentage of tourists leaving your country who fished. These figures should serve as your “official” count of non-resident anglers, provided that the tourism agency conducted a thorough study and that its figures are generally accepted by other stakeholder groups in the region. If fishing information is not collected on existing surveys, it might be fruitful to work with the agency to add these questions. This could provide opportunities for joint sponsorship of the survey effort and to enhance the credibility of your results.

Efforts to obtain angler count statistics from project team members should begin in the pre-analysis stage of the project. If such information is not available, or only available for a small geographic area or narrow segment of fisheries, maybe an existing survey can be expanded to count non-resident anglers. Although the primary purpose of these surveys is to ask questions about the number of days spent fishing and trip-related expenditures, it is common to add questions asking respondents to indicate the types of activities that he or she participated in. For example, non-residents can be asked if they participated in recreational fishing during their trip to your country along with other activities typically enjoyed by tourists. If they do not report fishing, their answers are recorded and the survey ends. By looking at the percentage of all tourists who fish, and matching this to the total number of tourists visiting your country or region, you will have determined the total number of non-resident anglers. Examples of how this has been done before are found in the sample surveys presented in Appendix A. These surveys were used in recent studies conducted by Southwick Associates for The Billfish Foundation in Panama and Costa Rica.

Your angler survey can be used in other ways to estimate the number of non-resident anglers. Suppose an organization on your project team has very reliable and generally accepted data on the number of non-resident anglers in a particular area. If the angler

⁴ For example, an approach that attempts to count anglers over an entire year would likely arrive at a lower total number than an approach that counts anglers over the busiest three-month quarter and then multiplies this amount by four.

survey finds, for example, that one out of every six survey respondents fished in this specific area, the figure provided by the stakeholder organization can be multiplied by six to arrive at an estimate of the total number of non-resident anglers across the entire country.⁵

4.2. Design Your Survey

The next step of the data collection and analysis stage is to determine the amount of money spent by the typical angler. Per-person expenditure figures are used along with the count of anglers, discussed above, to estimate spending by all anglers. Your survey will be used to determine how much money anglers spend. Several aspects of the survey need to be considered, including its format (e.g., in-person, mail survey, etc.), the data collection plan (i.e., how to reach the target group), and the questions to ask.

4.2.1. *How Many People Will You Need To Survey?*

The number of people you will survey, known as your ‘sample size,’ is important. Too few, and your results will not be accurate and the assessment will fail to provide reliable estimates. Too many, and your assessment becomes unnecessarily costly and time-consuming. There is not an exact number or process to use when determining your sample size, and decent fisheries surveys have completed anywhere from a couple hundred to thousands of surveys. The larger and more diverse a fishery, the greater number of surveys that will be needed. There are automatic calculators online that can help you determine the number of surveys you will need to achieve specific levels of accuracy. In many cases, you will be prompted to enter how many anglers there are in your country or region being examined. You may not have the information requested by the calculator. Enlisting the help of an economist or survey specialist is useful. Otherwise, in most cases, a good rule of thumb is to have approximately 400 completed angler surveys behind any number you want to report, such as total expenditures, where they fish, etc.

Let us use an example. If we want to gain a general idea of a region’s anglers who fish for the various species available, a sample size of 100 would help. Though at this low number we may be a bit uncertain about the percent of anglers who target seldom-fished species, we will understand the approximate percentage that target the most common species. If there are species that are commonly fished by less than 10% of anglers, then with a sample size of 100, there is a good chance you will not find any anglers who target these rarer species. If it is important to know how many anglers are targeting rarely fished species, you will want to boost your sample size to 400 or more. If you need to describe anglers who target rarely fished species (versus just knowing the percent of anglers who target these species), such as identifying how much money they spend, their demographic characteristics, or their opinions, you will need to have at least 50 of these anglers (more than 50 is definitely better). Therefore, if these specialized anglers only represent 1% of

⁵ Similarly, information from members of the project team can be used to supplement the angler survey as a way to estimate the number of all (i.e., resident and non-resident) anglers. Suppose that a fisheries agency has found that 20 percent of all anglers are tourists. The survey can be used, as described above, to determine the number of non-resident anglers, which—in this case—can be multiplied by 5.0 (i.e., 1.0 divided by 20 percent) to estimate the total number of anglers.

your total angler base, and you want to achieve a reliable sample size of 100 surveys, you will need to survey 10,000 anglers in total to find your 100 specialized anglers ($100/.01 = 10,000$). Carefully consider the cost of your survey along with your detailed information needs when planning how many surveys you will need to collect.

4.2.2 Selecting the Survey That Best Fits Your Needs and Resources:

The most appropriate options for the survey format are an in-person intercept survey, mail survey, or an on-line survey. Collecting the data in-person would involve people asking questions of anglers in one-on-one interviews and then writing the responses on a form or entering them into a computer or tablet device. If the target group is non-resident anglers, intercept surveys should be administered at tourism destinations and transportation hubs. Since the survey asks about fishing activities and expenditures over the entire trip, the best places to collect information are points where tourists exit the country; e.g., international airports, cruise ship terminals, etc. Do not survey them when they first arrive as they do not know how much they will be spending.

An advantage of intercept surveys is that you can collect spending and other data directly from anglers when the information is fresh in their minds. Also, if surveys are administered at points of exit, the survey administrators have access to large numbers of tourists who are often waiting in a confined space (i.e., people typically arrive at an airport or ship terminal in advance of the departure time) at predictable times of the day (i.e., airplane and cruise ship schedules are readily available). This means that the survey administrators will encounter large numbers of people, who will likely be willing to spend a few moments providing information about their stay. A disadvantage of intercept surveys is that the format limits the number of questions that you can ask. The longer your survey, the more likely people will quit in the middle of your survey. This is true for all surveys.

Intercept surveys are often not an effective way to collect information from resident anglers. It can be difficult to identify places where you could —on a regular basis— encounter enough anglers at specific times to efficiently collect data.⁶

A mail survey involves developing a paper questionnaire that is distributed to anglers in the target group, who complete the form and return it by mail. This approach, of course, is only effective if you have a reliable mail service in your country, and is difficult and not advisable to administer to non-resident anglers. Non-residents are likely to not return it once they return home due to uncertainty about postage and delivery, among other reasons. The questionnaires can be distributed by hand at places, described above, where tourists exit the region. Additionally, mail surveys can be distributed to non-residents at resorts, marinas and other tourist attractions. Although it is not recommended to conduct intercept surveys at these places because anglers have not finished their trip, distributing

⁶ Places where you could find significant numbers of resident anglers include fishing shows and expeditions, but they are held infrequently. Intercept surveys require visiting fishing locations many times during a year to collect enough data for your study. If the goal of your study is to measure economic contributions of tournaments, then intercept surveys are often ideal.

mail surveys at tourism attractions is fine because individuals can complete them later. Please note that many anglers will lose or throw away surveys handed to them, so you will need to give out many surveys to receive a few in return. How many you will receive back varies based on the greeting and message provided by the person handing out the surveys, the appearance of the survey, the inclusion of a mail envelope complete with postage, if the survey questions are clear and understandable, and more.

Mail surveys can be distributed by hand or sent to potential respondents. This data collection method is a good option if the project team has access to mailing lists of anglers/tourists from recreational fishing organizations, tourist destinations, or other sources. Mail surveys can reach resident anglers in instances where common gathering places do not exist. A key advantage of mail surveys is that, compared to intercept surveys, they can be used to collect more information—but they should be designed to require less than ten minutes to complete. Another advantage of distributing questionnaires by mail is survey administrators have a mail list that can be used to send follow-up reminders and replacement questionnaires to non-respondents. This practice, found to increase response rates, is recommended and usually not possible if the mail survey is distributed by hand.

When using a mail survey, consider the use of an incentive to encourage greater responses. Incentives can include a cash prize or a gift certificate, lotto tickets, free fishing tackle, etc. Winners can be randomly selected from the list of all respondents.

Another common data collection method is an on-line survey. This involves developing a project website where anglers can complete the questionnaire.⁷ Respondents would be asked to participate using an email message with a link to the on-line survey. This is typically a viable lower cost option, compared to mail and intercept surveys, if the project team has access to anglers' email addresses. Savings come from lower costs of printing and mailing, as well as data entry. Most on-line survey programs are designed to export responses into a computer format (e.g., spreadsheet file) that can be used in the data analysis stage.

A drawback of using on-line surveys is the difficulty of obtaining a comprehensive email list of anglers. Although the survey administrators could solicit on-line respondents through the use of a “paper form” (e.g., a mailing, brochure, or bookmark with the Internet address), on-line survey response rates can be low in cases where an electronic link is not provided through an email message or another website. Sometimes, resorts and businesses catering to anglers can provide email addresses of their customers, and some of them likely fished while visiting. Likewise, if internet access is limited, then online surveys may not be as effective as other survey options.

⁷ Several companies offer software and support for conducting on-line surveys. The authors of this report have on-line survey services in-house.

A partial list of the trade-offs between different survey methods include:

Survey Method:	Advantages:	Disadvantages:
In-person interviews	Anglers will have the freshest recollection of their expenditures and activities, when interviewed while fishing.	Anglers may be difficult to reach if they depart and return from private marinas and docks, or fish on private lands.
	Ideal for when your target audience travels through common places, such as airports or a marina.	Can be costly to pay people to administer surveys. Long surveys can be a problem when people might be in a hurry at your survey locations.
Mail	Great for when mail lists of anglers are available.	Takes longer to administer, based on the number of days needed to send out and receive responses.
	Many businesses serving anglers will have customer lists available.	Difficult to send and receive surveys from other countries, if non-residents are in your target audience.
Phone	Great for when mail lists of anglers are available.	You may need to hire a costly professional phone center to administer surveys day and night. Volunteers are difficult to use to administer phone surveys.
Email	Lowest cost option, if email addresses for anglers are available.	Email surveys usually have very low response rates which lowers the quality of the responses, and may result in too few responses.
	Email surveys can be conducted rather quickly compared to other types of surveys.	You may need to acquire special complex software if you do not have access to a web specialist.

4.2.3. *Is a Hybrid Survey Your Best Option?*

Often, there are tradeoffs to consider regarding costs, length of survey, ease of collecting the data, and obtaining a representative sample. If the target group is non-resident anglers, a hybrid approach that combines intercept and mail surveys could be used. The survey administrators could provide respondents an option of completing a short survey

in person, and reply to the remaining questions in a mail survey that would be completed and returned later. If the target group is all anglers, a multi-pronged approach could include intercept surveys to reach non-residents, as well as an on-line survey for resident anglers. If an on-line survey is developed for locals, the survey administrators could provide tourists the option of completing an intercept survey or provide a letter and brochure with a link to the survey website. Another hybrid approach would be to combine or merge your survey with another ongoing survey, such as a tourism survey. By combining surveys, costs can be lowered and/or greater access to respondents can be achieved.

Economic impact studies can look at the contributions from a single event such as a tournament, or the economic impacts from the entire recreational fishery over a course of a year. Be sure the survey questions are properly worded to capture all expenditures within your specific time frame:

Single-event studies: if your study is reporting the economic impacts from a single event such as a tournament, people do not have to recall expenditures made over a long time period. Angler expenditure questions need to ask how much anglers spent for items and services such as food, fuel, lodging, food, crew, bait, transportation, etc. It helps to ask questions per item, such as how much was spent on food, then lodging, etc. The sample surveys in Appendix A can serve as your guide. Be sure that your questions discern between expenditures made within the study region, and only record equipment expenditures for items that were bought primarily for the event.

Annual studies: Anglers frequently have a difficult time recalling expenditures made over a 12 month period. To help minimize this problem, ask anglers how much is spent on average per trip and the total number of trips. During the analysis stage, as discussed later, the two numbers will be multiplied to quantify anglers' total annual travel-related expenditures. Equipment and durable items such as condos, boats, etc can be used for many fishing trips. These items certainly are not multiplied by the number of trips taken. These items should be asked in separate questions. Only document equipment expenditures made within the study region.

4.2.4. *About Collecting Quality Data:*

Equally as important as the choice of survey format is making sure your results represent all anglers in your target group. A poor survey misses many of the people you need to include, and can under- or over-estimate results. Be careful of the following problems:

- As best as possible, your data collection method should not favor one type of angler over any other. For example, if you only survey non-residents in January and February, these anglers may prefer different species or spend less money than anglers who visit in September and October.
- If your target group is resident anglers and the selected method is an on-line survey, the sample should not rely on an email list from a single fishing organization—even if it has a large number of members. This is because members of a particular organization may typically spend more or less money

than non-members. They may prefer one type of fishing compared to non-members. These differences could result in an over- or under-statement of average expenditures.

- Your survey should aim for collecting data across different times of the year, different places and regions of the country, types of fishing, different sources of anglers, etc.

If you will be using an in-person or phone survey, be sure your interviewers know the purpose and goals of your project. If they know the details of why you are conducting your project, they will be able to answer questions anglers may have, resulting in accurate and consistent answers.

4.2.5. *Selecting Which Anglers to Survey:*

When working with mailing lists or conducting a survey in person, the survey administrators can take two approaches to sampling. One way is to survey all members of a mailing list or all tourists that are encountered. This approach makes sense if the survey administrators are dealing with small numbers of anglers or if the data collection method is low cost. Another way, which is more common, is to select a limited number (i.e., sample) of people from a mailing list or intercept survey location. Participants should be selected at random, which means that everyone has an equal chance of being contacted to take your survey. A simple random survey can be done for mail surveys, by deciding how many surveys the project team would like to distribute (e.g., 500 surveys, based on your budget) and then dividing the size of the mailing list (e.g., 2,000 names) by this number. The value obtained, in this example 4.0, indicates that the survey administrators should select one out of every four names from the mailing list. For intercept surveys, a similar approach can be used to determine the frequency of tourists that should be approached. Other increasingly complex methods are available and can be designed with the help of a survey expert.

4.3. Construct the Questionnaire

Once you have selected your preferred survey method, you will next construct your survey questionnaire. For a basic economic impact assessment—i.e., the project team is not interested in collecting information about angler attitudes and opinions—the most important information to collect is spending data and the number of days spent fishing.

4.3.1. *Expenditure Categories to Collect*

There are two types of expenditure data you will generate:

Travel expenditures include hotels, food from grocery stores and restaurants, travel (airfare, auto rental, gasoline for autos, etc), fishing guides, boat and gear rental, and similar expenditures made by anglers to travel to and from their destination and for services once at their fishing site. Travel expenditures also include souvenirs and items purchased on their trip within your country or the study's region

When to exclude certain expenditures

Please refer back to Section I for a discussion about “new money.” “New money” is received from non-residents who bring their funds into your economy. As you construct your survey, please consider when certain monies, especially those spent by residents, should be included in your analysis.

This manual will assume you are including all equipment and resident expenditures. You must determine if any expenditures should be excluded or not. Basically, if fishing was not possible, but the angler would have spent his or her monies anyways *within* your study region, then those monies should be excluded from your assessment.

Equipment and non-travel expenditures typically include fishing tackle, boats, trailers, clothing, regular boat maintenance and other goods and services not purchased as part of a specific fishing trip. These two types of expenditures are calculated in different ways, as explained in a moment.

4.3.1.1. *Travel Expenditures:*

The following equation can be helpful in understanding the data you need to estimate anglers’ travel dollars:

Angler-related travel expenditures = *Number of anglers x Average days fishing per angler x Average dollars spent per day per angler.*

Your analyst should estimate non-resident and resident expenditures separately. Per-day travel expenditures are likely to be higher for non-resident anglers. As discussed later, it is also important to determine if non-residents would have still visited your country or region, even if they could not fish. In cases where a non-resident would have still visited your country even if he could not fish, only his or her direct fishing-related expenses (charterboat, bait, supplies used while fishing, etc.) can be included in your economic impact estimates. The other dollars spent by these anglers would have been received by your country anyways and cannot be credited to fishing.

The formula above requires you estimate the average monies spent per angler. Sometimes, the angler who responds to your survey will have purchased services for several anglers. This is typical for families who travel together and share accommodations, meals, etc. It is important to adjust your estimates to reflect the average amount spent per person and not for the travel group IF those additional people would have visited even if fishing was not possible. Please see the Costa Rica survey in Appendix A where data are collected to make this simple adjustment in question 13.22 (“people included in this payment”).

4.3.1.2. *Equipment and Non-Travel Expenditures:*

Along with their travel expenditures, spending on fishing equipment and gear by resident and non-resident anglers can have a large impact on the economy. The formula used to estimate the amount of this type of spending is:

Fishing-related equipment and non-travel expenditures = *Number of anglers x Average annual per-angler equipment purchases within the country*

When tracking equipment and non-travel expenditures for residents, there are a few additional issues to handle:

- Be sure to specify your study's time period. For example, if your study will report economic impacts for 2011, your survey should only inquire about equipment purchased in 2011, and not record purchases in 2012 or 2010.⁸
- Also, if your study does not cover all fishing activities, such as an economic impact study of tournaments or freshwater fishing, then be sure to ask respondents if they would have purchased their equipment even if they could not fish in tournaments or freshwater. If they would have still made these purchases, then their economic impacts cannot be solely attributed to tournaments or freshwater fishing. These equipment purchases should be removed from your analysis.
- Equipment expenditures made by non-residents cannot be included unless those expenditures were made in the study area.

The average annual equipment purchases (within the country) per angler are estimated using information from the survey. In the two sample surveys in Appendix A, equipment expenditures are captured in questions 13.

Some of the anglers surveyed in the study will own boats that are used for recreational fishing. Spending to maintain these boats can be incorporated into the economic impact assessment in a manner similar to the equipment questions. In Appendix A, several types of expenditures related to maintaining a boat are covered in the Costa Rica survey in question 14. The Panama survey asks whether the respondent owns a boat in the country (question 14); however, spending to maintain the boat is captured in an "other expenditure" category (part 13.120) in the question about all types of spending. Either approach is acceptable. The decision of whether to include specific questions about spending to maintain a boat should be made based on the project team's knowledge about the likely number of anglers who own a boat, and based on survey responses indicating the boat expenditures would have occurred even if the boat could not be used for fishing.

Sample materials from recent surveys conducted in Costa Rica and Panama are presented in Appendix A. These letters follow the methodology presented in this manual, and can be used in developing your survey questionnaire. Also included on *The Billfish Foundation* letterhead is an example of a "request to participate" letter used for an intercept survey. This letter, to be handed to a respondent prior to conducting the survey or used as an introduction on an email survey, tells the potential participant who is conducting the study, why the information is being collected and how it will be used, the amount of time the survey will take to complete, and the study's benefit to anglers. A cover letter accompanying a mail survey would contain similar information along with

⁸ In the case of boats, condos and other higher cost items frequently financed over years, it is simpler to ask respondents to report the full cost of item purchased, and only record those items purchased during the study's time period. Payments made for items purchased outside the time period would not be included. For example, if your study covers all of 2012, any purchases or payments for boats made in 2011 would not be included in your study.

instructions on how to return the questionnaire (e.g., “Please return the completed survey in the postage-paid envelope that is provided.”).

Both of the sample questionnaires were used for intercept surveys of non-resident anglers. One of the first questions is whether the respondent participated in recreational fishing—along with other activities. As noted above, the percentage of all survey respondents who participated in recreational fishing multiplied by the number of all tourists to the country (from another source) can be used to estimate the number of non-resident anglers (if this information is not already known).

Two other critical data elements—number of days fished and average expenditures—are obtained from later sections of the survey. Question 8 of the Costa Rica survey and question 9 of the Panama survey both ask about the number of days fished. The Panama survey covers multiple regions of the country, while the Costa Rica survey collects information on the total number of days fished without regard to location. Question 13 on both surveys solicits angler spending figures across a wide range of tourism-related categories.

4.3.2. Identify How Many Anglers Were Served Per Expenditure

When collecting information about angler spending, it is important to know how many people are covered by the expenditures. This information is needed so the figures can be converted, if necessary, into ‘spending per angler’ estimates. In the case of the Costa Rica survey, question 13.22 asks—after collecting information on expenditures—“how many people are included in this payment?” This number can be used to convert the expenditure figures in question 13 into per-angler values. In the Panama survey, the instructions for question 13 ask the respondents to not include “expenditures you made for others in your travel party” and to “only report your share, as best as possible.” Using this approach, the expenditure data collected in Panama can be used directly as it is reported to the survey administrators.

4.3.3. Total Trip Days vs. Total Days of Fishing

As the survey data are analyzed, the expenditure figures (per angler) should be further converted into a value per day spent in the region. The calculation is simple: divide the ‘amount of spending per angler’ by the total ‘number of days the angler spent in the region’. Do not divide by the number of days spent fishing which are often fewer as anglers may not fish every day of their trip. It is reasonably easy for anglers to tell you how much they spent over the entire trip, but can be more difficult to report how much was spent just on their fishing days.

4.4. Fielding Your Survey

4.4.1. Pre-Test Your Survey!

It is strongly recommended to pre-test the survey prior to its wide-scale implementation to make sure that the questions are appropriate, will provide the intended information, and that your respondents accurately understand your questions. A pre-test involves

conducting a small number of surveys in the same setting that the main survey will use (in-person, internet, phone or mail). It is helpful to ask respondents after completing the survey if any questions were confusing or not clear. Then, the analysts review the pre-test results and comments received to determine if any questions need to be reworded and to ensure if questions are being interpreted as expected.

If using an in-person or phone survey, pre-testing helps to ensure your surveyors are ready and can answer questions anglers might have. Surveys of tournament anglers can receive greater response rates if anglers are required by the tournament organizers to complete a survey to remain eligible for prizes.

After the pre-test is completed and the survey questions are finalized, the full survey is then performed. Once complete, the data collected from the surveys should be entered into a computer program, such as a spreadsheet or other statistical software, for analysis. This allows for easy management of the data set and calculations of average values that can be used in the economic impact assessment.

5. Data Entry

Most analysts will use a spreadsheet to enter their data. Use the software that works best for you. If you do not have experience with computer spreadsheets or statistical software, find assistance from someone who does. You will want to enter all responses to all questions, and can modify your spreadsheet as you conduct your analysis.

An important thing to consider when entering the data is to make a distinction between blank observations (questions that anglers did not respond to) and values that should be entered as zeros. Blank, or missing, values occur when a respondent does not answer a question or the question was not relevant. In some cases, for example, when an angler does not report boat-related spending because he does not own a boat, missing values should be converted into zeros and included in the calculations of average spending by all anglers. In other cases, such as an angler who does not provide any sort of expenditure information, missing values should not be converted into zeros and that angler should not be used in calculations of average expenditures. In this case, mistakenly counting all missing values as zeros will lower average expenditure figures and incorrectly reduce the size of the economic impact estimates. On the other hand, mistakenly removing zeroes from the analysis when they are needed will increase average expenditures and incorrectly inflate the overall economic impact. Attention must be paid to entering the survey data so that missing values are converted into zeros or removed from the analysis as appropriate.

6. Developing Estimates of Angler Expenditures

At this point, your survey has been designed, your survey has been conducted, and you are now ready to develop your estimates of angler expenditures. The following is an example of how to use the angler surveys to estimate overall spending. Suppose that a member of the project team knows that the country welcomes one million visitors per year and the survey (questions 3 and 2 in the Panama and Costa Rica surveys, respectively) finds that 23 percent of the respondents participate in recreational fishing. Multiplying the number of visitors by the percentage that participates in recreational fishing, we arrive at a “number of anglers” estimate of 230,000 people. From the survey, we learn that one-third of these (or 76,590) visited for the primary reason of fishing, and others (153,410) would have still visited even if they could not fish. This is the first part of the equation.

For the 76,590 anglers who visited for the purpose of fishing, the survey tells us the average angler stay for 5 days (questions 8 in the Costa Rica and Panama surveys in Appendix A). Multiplying the number of anglers by the average number of days fished per angler, we arrive at an estimate of 382,950 fishing days by non-residents who visited for the main reason to fish. Suppose finally that anglers report spending an average of \$250 per day on travel-related expenses over their entire trip. Multiplying this spending figure by the number of days visited, we arrive at \$95,737,500 in new dollars.

For the other 153,410 people who fished, but would have visited even if they could not fish, we learn from the survey they fished an average of 2 days during their trip (questions 9 in the Costa Rica and Panama surveys), though they stayed in your country for 7 days. Multiplying the number of anglers by the average number of *days fished* per angler (2 days), we arrive at an estimate of 306,820 fishing days by non-resident anglers. Suppose finally that anglers report spending an average of \$250 per day on travel-related expenses over their entire trip. Multiplying this spending figure by the number of days spent fishing, we arrive at \$76,705,000 in expenditures by these non-residents.

The final step to determining the total expenditures made by visiting anglers would be to add in equipment and other purchases made by visitors. All expenditures made in your region or country by people who visited primarily for fishing can be included, and only fishing-related purchases should be included for the others.

Although the sample surveys and examples provided above apply to non-resident anglers, the same general approach can be used to collect trip-related spending figures for domestic anglers. In many places, non-residents spend more on trip-related items than residents, however, as residents can leave home, fish and return on the same day, without paying for a hotel and little on food and restaurants compared to overnight visitors. Another example is that non-resident anglers are more likely to hire charterboats and other more expensive forms of transportation compared to residents who might own their own boat or have access to a friend’s boat or other lower cost options.

The example surveys provided in appendix A can be modified for use in most nations. Although the questions used in Panama and Costa Rica are different, they are meant to obtain similar types of information: whether a non-resident tourist participated in recreational fishing, the number of days that an angler fished, spending data, and demographic characteristics (e.g., gender, income, place of residence). The project team should review these questionnaires and revise the list of activities available to people in the country to present along with recreational fishing, as well as modify the listed fish species that are common to your area. You will likely find other edits and changes necessary to match your specific location and needs.

6.1. Allowing for Sponsorship Funds (Tournament Studies)

Many companies pay local organizers to have their name associated with the tournament. These sponsorship monies provide positive economic contributions to the area. Be sure your study captures the money brought into the region by these corporate donations. Tournament organizers can report the amount paid by companies outside your region. Simply add these to the total angler expenditures.

7. Estimate the Total Economic Impact of Recreational Fishing

The final step of the data collection and analysis stage is to estimate the total economic impact of recreational fishing. This involves matching your angler expenditure figures with the appropriate multipliers.⁹

To select the multipliers that best match your economy and situation, your project team could partner with someone who has experience in economic impact modeling such as the authors of this manual. When possible, it is recommended to enlist the help of a local economist who might know of multipliers available to your country or region under study. When a local economist or local multipliers are not available, please use the process offered next and the multipliers listed in Table 1. Further descriptions of multipliers and limitations are presented in Appendix B. If you do not have assistance from an experienced economist, use the procedures offered below.

Please note that multipliers are crafted for specific economies. Transferring one multiplier to another economy is not recommended unless there are no other options available. To decide which countries are similar to yours, the United Nation's Human Development Index is recommended (<http://hdr.undp.org/en/content/human-development-index-hdi>). This index rates countries on multiple factors including levels of economic development, and is a good way to identify countries similar to yours. More detail is provided in the following section.

⁹ Multipliers are unique to a given region, sector of the economy and time period. This makes it difficult to apply a multiplier developed for other countries or region to your study. However, the cost of developing multipliers for countries or activities where none are already available can be very expensive and time consuming. The impact tool and multipliers presented in this report will help you apply the multipliers the best matching your local economy, but may not perfectly represent the actual effects within your economy. Please note that the results must be considered rough estimates only.

If you do not have assistance from an experienced economist, please use the process presented in Section 7.2, along with multipliers available in Table 1 of the same section.

7.1 Residents vs Non-Resident Impacts

If your target group of anglers includes non-residents and residents, spending figures should be analyzed separately. As noted earlier, the expenditures made by resident and non-resident anglers often have different interpretations in terms of their impact on the economy. By developing separate estimates for resident and non-resident impacts, you can better communicate the impacts to tourism (non-resident impacts only), and simply add the resident and non-resident impacts together to estimate fishing's overall economic contribution.

7.2 Estimating Economic Impacts – Multiplier Definitions and Steps

In general:

$$\text{Total impact} = \text{total expenditures} * \text{multiplier}$$

Instructions are presented here, followed by an example after Table 1:

- 1) Select the multipliers to use:
 - a. If multipliers are provided for your country in the table below, you will simply use those figures.
 - b. If multipliers are not provided for your country, refer to the “HDI Index Ranking” column for your country. This refers to the United Nations’ Human Development Index (HDI) (<http://hdr.undp.org/en/statistics/>) which serves as a good indicator of a nation’s relative level of economic development. Find another country in the table with an HDI index similar to yours. You may not necessarily chose the country with a number closest to yours, but pick one with a similar HDI index that is also similar to your country. For example, if your study region was an island, you would want to pick multipliers from Table 1 from an island with a similar HDI and with a similar economy. It would be advisable to speak to someone familiar with your country’s economy and familiar with the economies in Table 1. In the selection process, pay particular attention to import patterns and chose a multiplier from a country with similar pattenrs. There is not an exact and precise way to pick a substitute country’s multipliers. Select the country you think is the best match.
- 9 Match your retail sales figure with each multiplier:
 - a. Output/Sales is the total amount of sales received by businesses and individuals within your country. Sales are generated as anglers spend their money, and then retailers and service companies respend these monies on more goods and production, plus they pay their employees who make further purchases. As businesses and people respend anglers’ monies within your economy, the impact of anglers’ expenditures grow. This figure tells you how much economic activity occurred in your economy as a result of spending by

anglers. To generate this estimate, simply multiply the amount spent by anglers by the Output / Sales multiplier.

- b. Income / GDP: the total amount of the nation's Gross Domestic Product (GDP) generated as a result of anglers' expenditures. Simply multiply the amount spent by anglers by this multiplier to learn how much of your country's GDP is generated by sportfishing.
- c. Employment: The number of jobs created or supported as a result of the economic activity generated by anglers' expenditures. These multipliers express the number of jobs supported for every \$1 million spent by anglers.
 1. First, divide the total amount spent by anglers by 1 million.
 2. Then, multiply the result by the employment multiplier.
- d. Tax Revenues: the total amount of the nation's tax revenues resulting from anglers' expenditures. Simply multiply the amount spent by anglers by this multiplier to learn how much of your country's tax revenues is generated by sportfishing.

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Table 1. Economic Multipliers by Nation

Country	HDI Index Ranking 2011*	Output / Sales	Income / GDP	Employment per US\$1 million Spent by Anglers	Tax Revenues	Source
Alaska	4	1.16	0.39	11.46	-	Southwick Associates 2008
Antigua & Barbuda	60	0.87	0.88	-	-	Horvath 1981
Bahamas	53	1.02	-	35.80	-	Fedler 2010
Bahamas	53	0.87-1.25	0.78	-	-	Loutfi, Miscardini and Lawler 2000, Horvath and Frechtling 1999
Barbados	47	1.41	-	-	-	Horvath 1981
Belize	93	1.11	-	-	-	Horvath and Frechtling 1999
Bermuda	N/A	1.09-1.66	1.10	-	-	Horvath and Frechtling 1999, Horvath 1981, Batta 2000
Brazil	84	1.87	-	91.76	-	Casimiro 2002
British Virgin Islands	N/A	0.98	-	-	-	Horvath and Frechtling 1999
Cayman Islands	N/A		0.65	-	-	Horvath 1981
Columbia	87	-	-	-	-	
Costa Rica	69	-	1.28	135.00	0.17	TBF/UCR/Southwick 2010
Cuba	51	1.50		59.48	-	Crespo 2007
Dominica	81	1.20	1.20	35.80	-	Horvath 1981
Eastern Caribbean	N/A	1.07	1.07	-	-	Horvath 1981
Guatemala	131	-	-	-	-	
Guyana	117	-	-	-	-	
Haiti	158	-	-	-	-	
Hawaii	4	1.03	0.34	9.35	-	Gentner and Steinback 2008
Honduras	121	-	-	-	-	
Jamaica	79	1.02-1.94	-	1.48	-	McCatty and Serju 2006
Mexico	57	1.78	-	55.07	0.39	TBF/Southwick 2008
Nicaragua	129	1.65	-	-	-	Rainforest Alliance 2009
Panama	58	1.74	0.50	97.00	0.03	TBF/Southwick 2013
Puerto Rico	4	1.08	-	-	-	Horvath and Frechtling 1999
Suriname	104	-	-	-	-	
USA, National	4	2.62	0.76	16.98	-	Gentner and Steinback 2008
USA, Texas	4	1.32	0.42	10.92	-	Gentner and Steinback 2008
Venezuela	73	-	-	-	-	

7.3 Example of the Calculation Process:

This example uses a fictitious country: Anglerland. The goal of our study was to determine the total U.S. dollars brought into our country by visiting anglers. Therefore, our angler survey only looked at visiting anglers and determined they spend \$25 million each year in Anglerland. We used the following steps to determine the economic impacts.

1. Select a country: Anglerland does not appear in the multipliers table (Table 1). Therefore, we must select a country that best compares with Anglerland. We select Antigua & Barbuda because its economy and other characteristics are similar to Anglerland.
2. Calculated impacts:
 - a. Output/Sales \$25 million (annual angler spending) x .87 (from Table 1, for Antigua & Barbuda) = \$21.75 million. This is the total business activity (output or sales) resulting from angler expenditures in Anglerland. This amount (\$21.75 million) is less than the amount actually spent by anglers because many angler dollars immediately leave the country as a result of a high rate of imports (food, fuel, etc.) and foreign ownership of some hotels, marinas, etc.
 - b. Income / GDP: \$25 million (annual angler spending) x .88 (from Table 1, for Antigua & Barbuda) = \$22.0 million. This is recreational fishing's total contribution to Anglerland's Gross Domestic Product (GNP).
 - c. Employment: A multiplier is not available for Antigua & Barbuda for employment. We can either not produce an employment number, or use a multiplier for a different country. In this case, we decide to use Bahamas because it is also an island nation and has an HDI similar to Antigua's, which we already determined is similar to Anglerland.
 1. First, divide the total amount spent by anglers (\$25 million) by 1 million = 25.
 2. Then, multiply the result (25) by the employment multiplier (35.8) to derive the total jobs supported by visiting anglers in Anglerland = 895 jobs.
 - d. Tax Revenues: We determine that the tax structure in Anglerland is very different from other countries for which tax revenue multipliers are available. We skip this measurement.

Our analysis is now complete:

- Annual spending by visiting anglers = \$25 million
- Annual economic activity generated by these anglers = \$21.75 million
- Annual contribution to GDP = \$22.0 million
- Total jobs supported by visiting anglers = 895 jobs

8. Post-Analysis Stage: Be Sure to Communicate the Results

The post-analysis stage involves interpreting the project results and disseminating the findings to all organizations, policy makers and others involved in fisheries, economic and tourism policy. The figures in the table generated by the economic impact assessment tool represent the economic impact (or contribution, depending on the study) of recreational fishing on the region of interest. The total revenue, employment and income numbers are indicators of the importance of recreational fishing to the economy. In the case of an economic impact study that focused on “new money” brought into your economy by recreational fishing, these figures are interpreted as “what would be lost” if recreational fishing were to no longer exist. In the case of an economic contribution study that also includes spending by local residents, the total revenue, employment and income figures are measures of the overall economic activity that is related to recreational fishing. In both types of studies, the direct revenue, employment and income are supported by angler spending, while the multiplier effects are supported by the spending of businesses and workers—across all sectors—that results from the flows of expenditures among the economy.

You will likely want to develop a report that explains how you developed your estimates, how and where you obtained your survey data, your source of multipliers, why your selected methods were the best methods possible, and the final results. The economic impact assessment results should be prominently featured in the project team’s final report along with comparisons of recreational fishing to other activities—if available—and the overall economy. The final report should also include summary tables and a discussion of other information that was collected in the survey. For example, the report could highlight the demographic characteristics of anglers—useful to businesses that sell goods and services to them—and other information about the activities of anglers or their opinions identified in your research. Be sure a summary of all key results is provided in the beginning of the report. Most readers will not want to read the supporting text, and just want to see the results. Make it easy for them to find a simple summary of the results.

Drafts of the report should be distributed to project team members for their input and comments. When the report is finalized, it should be distributed to tourism and fisheries stakeholders, and posted on the sponsoring organization’s website.

If you have completed all steps in this manual and have communicated the results – Congratulations!! Please share your results with your neighbors. Best of success!

Glossary of Terms and Definitions

(All definitions are specific to recreational fishing)

Economic Impacts: the financial and monetary impacts generated within an economy as a result of anglers' expenditures. Impacts can be divided into:

Direct Impact: these are the jobs and income generated by anglers' initial expenditures.

Indirect Effects: these are the impacts generated in your economy when businesses and workers re-spend anglers' dollars. See the "Multiplier Effect" discussion in Section I for more details.

Induced Effects: these are the additional impacts created when employees of firms who benefit from anglers' dollars spend their portion of their paychecks attributable to anglers.

Total Impact: This is a simple sum of the direct impact, indirect and induced effects.

Ecosystem approach to fisheries: an ecosystem approach to fisheries strives to balance diverse societal objectives by taking into account the knowledge and uncertainties about biotic, abiotic and human components of ecosystems and their interactions, then applying an integrated approach to fisheries within ecologically meaningful boundaries.

Employment or Jobs impacts: The number of jobs created or supported as a result of the economic activity generated by anglers' expenditures. Employment can be divided into direct, indirect and induced impacts.

GDP contributions: the amount or percent of the country's Gross Domestic Product generated as a result of anglers' expenditures.

Multipliers: ratios that explain the level of jobs, tax revenues or other contributions generated for each unit of currency spent. For example, a sales multiplier of 1.1 reports that \$1.10 in total sales occurs within the economy for every dollar spent by anglers.

Recreational fisheries sector: the entire network of stakeholders involved in or fully or partly dependent on recreational fisheries including amongst others fisheries ministries and agencies, managers, non-governmental organizations (e.g., umbrella angling associations and clubs), anglers, non-angling recreational fishers, tackle shops and tackle manufacturers, bait suppliers, charter-boating industry, recreational boat builders and chandlery suppliers, marina operators and specialised angling and fishing media, recreational fishing tourism and other related business and organisations as well as all other enterprises supporting recreational fisheries including aquaculture operations that produce stocking material or commercial fishing enterprises that sell angling tickets on their waters. A range of other stakeholders and managerial regimes are not included in this definition though they may run or advocate activities and developments that have

a direct impact on the recreational fishing quality and the recreational fisheries sector, the sector's viability and growth potential (e.g., hydropower generation, water management, irrigation).

Recreational fishing: fishing of aquatic animals that do not constitute the individual's primary resource to meet nutritional needs and are not generally sold or otherwise traded on export, domestic or black markets. The unambiguous demarcation between pure recreational fisheries and pure subsistence fisheries is often difficult. However, using fishing activity to generate resources for livelihood marks a clear tipping point between recreational fisheries and subsistence fisheries. Globally, angling is by far the most common recreational fishing technique, which is why recreational fishing is often used synonymously with (recreational) angling.

Appendix A

Sample Surveys

COSTA RICA

QUESTIONARIE AIRPORT
INSTITUTO COSTARRICENSE DE TURISMO / FUNDACION BILLFISH /
SOUTHWICK ASSOCIATES / UNIVERSIDAD DE COSTA RICA

SURVEYOR: Please enter the month when this survey was taken:_____

1. Prior to this trip, how many times have you visited Costa Rica? ____ # of times
2. Please mark which activities you participated in during this trip to Costa Rica:
 - 1 Nature tours / wildlife viewing
 - 2 Hiking
 - 3 Horseback riding
 - 4 Sport fishing
 - 5 Sailing
 - 6 Relaxed on a beach
 - 7 GolfOTHERS?_____
3. If you could not have fished, would you visit Costa Rica again?
 - 1 Yes
 - 2 No
 - 3 Not sure
4. Before this trip, how many other trips have you taken to Costa Rica in which you fished?
__ trips
5. Who traveled with you, in your direct travel party, on this trip to Costa Rica?
 - 1 I traveled alone: __
 - 2 Spouse: __

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- 3 Kids, how many? ___ # of kids
- 4 Other family members: ___ # of other family members
- 5 Romantic partner: ___
- 6 Other friends, co-workers: ___ # of others

6. How many other members of your party also went sportfishing?
 ___ # of people in your travel party who fished in addition to yourself

7. How many days did you spend in Costa Rica area during this trip?
 ___ days in Costa Rica area

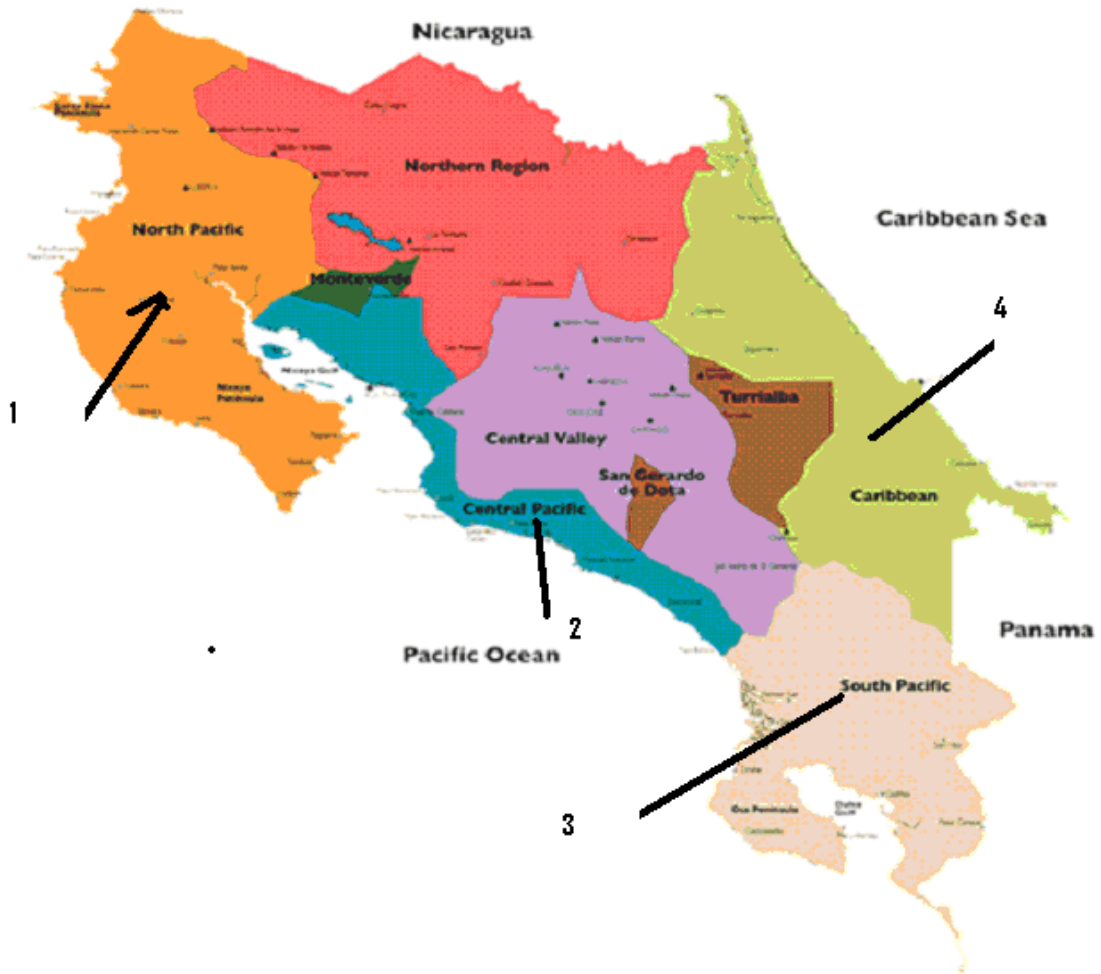
8. On your most recent trip, how many separate days did you fish? ___ # of days fished

9. Please indicate all modes of fishing you used during your most recent Costa Rica trip:
 - 9.1 fished from a boat ___ # of days
 - 9.2 fished from beach/shore/seawall ___ # of days fished
 - 9.3 other ___ # of days fished “other”

10. Please mark which species you expected to catch when you were planning your most recent trip to the Costa Rica area, and the species you actually caught while fishing here:

N.	NAME	Targeted:	Caught:
1	Marlin (any species of marlin)	1	1
2	Sailfish	2	2
3	Dorado / mahi-mahi / dolphin (fish)	3	3
4	Tuna (atún)	4	4
5	Wahoo	5	5
6	Tarpon (sábalo)	6	6
7	Sierra mackerel	7	7
8	Roosterfish	8	8
9	Yellowtail	9	9
10	Bottomfish (snapper, grouper)	10	10
11	Robalo / snook	11	11
12	Other	12	12
13	I didn't expect to catch any fish	13	13
14	I don't know/no opinion	14	14

11. Please mark the regions where you FISHED:



- 1 Region I
 - 2 Region II
 - 3 Region III
 - 4 Region IV
 - 9 I don't recall the region
-

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The next questions inquire about how much you (and/or your travel group) spent in this trip to Costa Rica. Please report all expenditures in U.S. dollars. (Note: to convert colones into dollars, divide the colones by 500. For example, 1000 colones would equal 2 dollars):

12. Please report expenditures you made prior to departing on your fishing trip to the Costa Rica area. SURVEYOR: If the person did not purchase one or more of the following items prior to arriving in Costa Rica, please leave the box blank.

12.1 Package trips or tours:	\$
12.2 Airfare (commercial):	\$
12.3 Charterboats paid for in the US or outside of Costa Rica	\$
12.4 Other travel-related purchases made prior to departing home.	\$

13. Please estimate as well as possible the expenditures made while in Costa Rica. Please do not report any expenditures made outside of Costa Rica. Please report in U.S. dollars (CHECK IF ENTERED AS COLONES)

13.1 Gasoline, fuel and oil for your vehicle	\$	
13.2 Taxi's, shuttle vans, etc to get to hotels, marinas, restaurants, etc.	\$	
13.3 Charterboat fees, fishing guides	\$	
13.4 Car rental (not including any fuel purchased)	\$	
13.5 Boat rentals	\$	
13.6 Lodging: please report the type of lodging used and the cost:	\$	
13.7 Hotels/ Motels /Resorts:	\$	
13.8 Timeshare (please only report the cost associated with your trip and not	\$	
13.9 Campgrounds	\$	
13.10 Other (please specify):	\$	
13.11 Restaurants, bars, carry-out food	\$	
13.12 Groceries, food, liquor bought in stores (not in restaurants or bars)	\$	
13.13 Ice	\$	
13.14 Bait (natural bait only, such as mackerel and bait bought at the launch of	\$	
13.15 Gifts & souvenirs of any type	\$	
13.16 Entertainment and amusement/admission fees	\$	
13.17 Fish processing & shipping:	\$	
13.18 Taxidermy (only taxidermy fees paid to Costa Rica businesses, not U.S.	\$	
13.19 Personal items (toiletries, medicine, etc.)	\$	
13.20 Rods, reels, fishing tackle & misc related items (line, leaders, lures,	\$	
13.21 Other (except fishing and boating equipment which is the next question):	\$	
13.22 How many people included this payment (include yourself)	\$	

14 Do you own or maintain a boat in Costa Rica? 1 Yes 0 No

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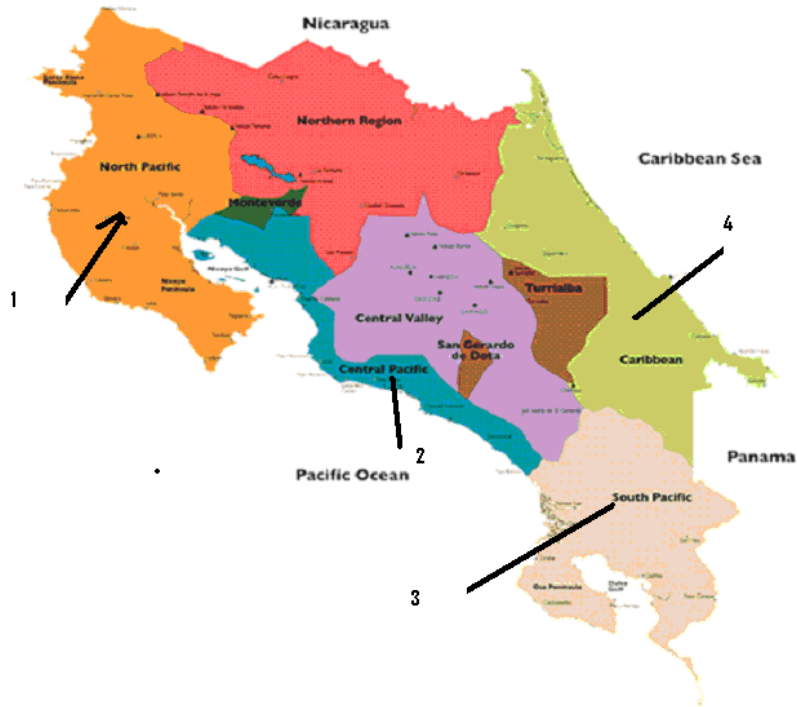
If YES, Please continue below.
 If NO, continue question 15

Please estimate how much you spend annually to maintain your boat in Costa Rica.
 Please report in U.S. dollars (CHECK IF PUT COLONES AND RATE OF
 CONVERSION)

:

14.1 Fuel	\$	
14.2 Repairing & maintenance	\$	
14.3 Captain & crew	\$	
14.4 Accessories, furnishings	\$	
14.5 Insurances, taxes	\$	
14.6 Marina expenses (slip fees & maintenance only. Parts and items purchased are covered in the next & final expenditure question)	\$	
Other:		

15 Looking at this map, which regions did you visit?



16. SURVEYOR: Was the respondent a: 1 Male 2 Female

17. COUNTRY: 1 US State 2 Canadá 3 Other

18. What was your total household income before taxes for last year?

Less than \$20,000

\$20,000 - \$40,000

\$40,000 - \$50,000

\$50,000 - \$75,000

\$75,000 - \$100,000

\$100,000 - \$150,000

\$150,000 - \$250,000

More than \$250,000

PANAMA



March – June 2012

Dear Angler:

We sincerely hoped you enjoyed your visit to Panama. To help Panama protect its fabulous fishing, The Billfish Foundation (TBF) is conducting an economic impact survey of sportfishing tourism. The results will be used to help conserve Panama's fisheries and abundant sportfishing opportunities. Once complete, the results will be used to demonstrate to Panama business and government leaders how healthy and sustainable sportfisheries provide jobs, tax revenues and other benefits to Panama. Your help is vital! Please take a couple minutes to answer the surveyor's questions. Your response will remain anonymous and confidential. The reward will be outstanding fishing opportunities and healthy fisheries well into the future. Thank you.

Sincerely,

Ellen M. Peel
President

TOCUMEN QUESTIONNAIRE
SENACYT/ATP/The Billfish Foundation

SURVEY

#: _____

SCREENER SURVEY

SURVEYOR: Please enter the date when this survey was taken:

Flight #:

Date:

1. What is your country or region of citizenship?
U.S. _____ Canada _____
Mexico _____ Central America (not including Panamanians) _____
Panama _____ South American _____
Europe _____ Caribbean: _____
Other (specify): _____

2. Prior to this trip, how many times have you visited Panama? ____ # of times

3. Please mark all activities you participated in during this trip to Panama.
 - 1 Nature tours / wildlife viewing _____
 - 2 Shopping _____
 - 3 Horseback riding _____
 - 4 Sport fishing _____
 - 5 Sailing/boating (not fishing) _____
 - 6 SCUBA diving _____
 - 7 Surfing _____
 - 8 Hiking _____
 - 9 Relaxed on a beach / Enjoy sun & weather _____
 - 10 Golf _____
 - 11 Zip lining _____
 - 12 Business _____
 - 13 Family / Friends / Wedding _____
 - 12 Other: (please report) _____

4. On a future trip to Panama, would sport fishing be of interest to you?
Yes No Not sure I do not plan to visit Panama
again

*[If "Sport fishing" was checked in question #3, continue with survey. If
"Sportfishing was not checked in question #3, END SURVEY. Be sure to match
the screener Qs to the completed full survey]*

SURVEY #: _____

IN-PERSON SURVEY

5. If you could not have fished, would you have still visited Panama?
- 1 Yes
 - 2 No
 - 3 Not sure
6. Who traveled with you, in your direct travel party, on this trip to Panama?
- 1 I traveled alone: ___
 - 2 Spouse: ___
 - 3 Kids, how many? ___ # of kids
 - 4 Other family members, how many?: ___ # of other family members
 - 5 Girlfriend or boyfriend: ___
 - 6 Other friends, co-workers, how many?: ___ # of others
7. How many other members of your party also went sportfishing?
___ # of people in your travel party who fished in addition to yourself
8. How many days did you spend in Panama during this trip?
___ days in Panama
9. Referring to our map, how many days did you fish in each region? [SHOW MAP TO RESPONDENT – ONLY MARK THOSE REGIONS WHERE PEOPLE ACTUALLY FISHER. ALL BLANKS WILL BE TREATED AS ZERO]:
- Region I = ___ days
 - Region II = ___ days
 - Region III = ___ days
 - Region IV = ___ days
 - Region V = ___ days
 - Region VI = ___ days
 - Region VII = ___ days
 - Region VIII = ___ days
-

10. Which species did you target catching when you planned this trip to Panama, and which species did you actually catch while fishing here?

N.	NAME	Caught (just check if they caught these fish):
10.11	Marlin (any species of marlin)	
10.12	Sailfish	
10.13	Dorado / mahi-mahi / dolphin (fish)	
10.14	Tuna (atún: yellowfin, big eye, albacore)	
10.15	Wahoo	
10.16	Tarpon (sábalo)	
10.17	Sierra mackerel	
10.18	Roosterfish	
10.19	Grouper, amberjack	
10.20	Robalo / snook	
10.21	Shark	
10.22	I didn't expect to catch any fish	
10.23	Cubera snapper, mullet snapper	
10.24	Bonefish	
10.25	Peacock bass / cichlids / Oscars	
10.26	Freshwater trout	
10.27	Other	
10.28	I don't know/ do not remember	

11. Did you spend money at home, before you left for Panama, for travel packages, transportation, fishing or services while here?

- Yes (go to #12)
- No (go to #13)

12. How much was spent for the following items BEFORE you arrived in Panama. Please only report how much you spent for your share of travel expenses, and not the amount spent for any others in your travel party. Please include any expenditures made by others for you: *SURVEYOR: If the person did not purchase one or more of the following items prior to arriving in Panama, please leave the box blank.*

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12.11 Package trips or tours:	\$
12.12 Airfare (commercial airlines, not including air taxis to your fishing site):	\$
12.13 Charterboats paid for, before arriving in Panama	\$
12.14 Other Panama-related purchases made prior to departing home. Please briefly describe: _____	\$

13. Approximately how much did you spend for the following items while IN Panama, or others spent for you? Please do not report any expenditures made outside of Panama, or expenditures you made for others in your travel party. Only report your share, as best as possible:

13.111 Transportation (car rental, taxis, buses, gasoline, local flights, etc.)	\$
13.112 Charterboat fees, fishing guides	\$
13.113 Lodging: hotels, rental, camping, etc.	\$
13.1131 If the person reports timeshare or house they own, check here, and do not record any dollars spent for timeshare or a private house.	Yes: _____
13.114 Restaurants, bars, carry-out food	\$
13.115 Groceries, food, liquor bought in stores (not in restaurants or bars)	\$
13.116 Gifts & souvenirs of any type	\$
13.117 Entertainment and amusement/admission fees	\$
13.118 Fishing expenses (except charters): tackle, ice, sun screen, bait, and any other expenses associated with your fishing trips:	\$
13.119 Personal items (toiletries, clothes, medicine, etc.)	\$
13.120 Any other expenses made in Panama. What was it for? (boating, maintenance for a private house, etc.) : _____	\$

14. Do you own or maintain a boat in Panama?

Yes = _____

No = _____

15. How satisfied were you with your fishing experience in Panama?
_ Very satisfied __ Satisfied __ Unsatisfied __ Very unsatisfied

16. Which sources of information do you think influenced you the most to choose Panama as your destination. You can choose more than one:

- _ Friends or family recommendations
- _ Articles in outdoor or fishing media, including internet sites
- _ Articles in non-outdoor, non-fishing media and internet sites
- _ Travel agent
- _ Fishing club / other social or recreational group I belong to
- _ Other, please tell us: _____

17. Which category best describes your total household income before taxes for last year?

- _ Less than \$20,000
- _ \$20,000 - \$50,000
- _ \$50,000 - \$75,000
- _ \$75,000 - \$100,000
- _ \$100,000 - \$150,000
- _ \$150,000 - \$250,000
- _ More than \$250,000

[If the respondent does not earn in U.S. or Canadian dollars, report their income here in the currency of their choice] _____

18. Which category best describes your age?

- _ Under 21
- _ 21 to 39
- _ 40 to 55
- _ 55 to 65
- _ 65+

SURVEYOR: Was the respondent a: 1 Male 2 Female

Appendix B

A Discussion on Multipliers for Caribbean Regional Nations

The multiplier table contains the results of an exhaustive literature search for multipliers for WECAFC member countries. Multipliers are based on economic linkage within a particular study region, be that a city, state, country or group of countries. As such a multiplier is completely unique to that study region. However, economists that study multipliers have found that multipliers vary by the development of a particular country and the country's dependence on imports for the basic goods and services purchased by tourists and the business supported by tourism.

Particular caution is warranted for island nations because of imports/leakages. Often much of what is sold to tourists is imported, sometimes including labor. Also, many businesses are foreign owned. This results in small output multipliers for island nations. There are two types of leakages for islands. First round leakages occur as foreign exchange earnings flow out of the tourist destination almost immediately after they are spent. Items subject to this type of leakage include food and liquor, particularly for islands with little agriculture. These types of leakages occur in any study area, but are particularly strong for islands. For example, the output multipliers near or below one in the table reflect these types of leakages. Second round leakages occur when foreign exchange earnings circulate at least once through the economy before flowing out. This occurs when tourist hotels or other businesses are owned by foreign interests or when employees are brought in from outside the study area.

The multipliers presented here represent spending across all types of tourists. Fishing tourism differs in that fishing tourists tend to spend more on average than beach or wildlife viewing tourists, particularly in for-hire recreational services, or guided fishing, sector. However, higher spending alone does not impact multipliers, but the mix of sectors where they spend their money does. For example, for-hire fishing is typically one sector with higher multipliers than most other tourism purchases because it is both labor intensive and most of that labor is local. As a result, these multipliers are likely conservative, with the exception of fishing tourism multipliers from Gentner and Steinback (2008), TBF/Southwick (2008, 2010, 2012) and Southwick Associates (2008). Fresh, locally procured bait is another sector with higher multipliers than the typical tourism multiplier.

Caution is warranted when using these multipliers outside of the country or region where they were developed. If transferred multipliers are to be used, it is important to select similar countries with similar economies. For output multipliers most islands have multipliers less than or slightly higher than 1.0 while developed mainland countries have output multipliers between 1.5 and 2.0 and less developed countries have output multipliers less than 1.5. Regarding employment multipliers, more developed nations require less labor while less developed nation require more labor to produce the same goods or services. The United Nations Human Development Index (HDI) (<http://hdr.undp.org/en/statistics/>) can serve as a good indicator of a nation's relative development level and has been included in the table to help researchers select a multiplier from nations or economies with a similar ranking.

WECAFC/OSPESCA/CRFM/CFMC Working Group on Recreational Fisheries
Economic Impact Assessment Manual

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