An Ecotourism Perspective on Caribbean Billfish Fisheries

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In many Caribbean nations, tourism is a major source of eranings, supplemental to and possibly replacing, those of agriculture and extractive industries. Fish stocks and the recreational fishing opportunities they afford are but one of many natural resource based attractions that lure non-resident visitors (and their money) to various destinations in the Caribbean. Some tourists choose to go fishing offshore on an opportunistic basis during a visit featuring mostly sun and sand. For others, their primary motivation for a visit to a particular nation may be tied to the quality of fishing opportunities afforded. Furthermore, private sponsors in many Caribbean nations host tournament events which attract anglers as tourists.

Billfish species (blue marlin, white marlin, sailfish, and swordfish) in the Caribbean are a major tourism attraction for many recreational fishing enthusiasts. In addition to having the private sector infrastructure necessary to attract anglers, there must be stock abundance to provide the high quality fishing experiences sought by anglers. Caribbean billfish angling destinations must compete among destinations worldwide; to the extent that abundant fish stocks can be maintained, the region has an advantage in its close proximity to the major angling markets in the U.S.

Marine fisheries are usually mixed in that there is fishing by both recreational and commercial components. Furthermore, highly migratory billfish stocks available to anglers in one nation's Exclusive Economic Zone (EEZ) are subject to overfishing by commercial fleets in other nation's jurisdictions. Herein lie to major problems. To the extent that commercial harvesters reduce stock abundance below acceptable levels. They can reduce the extent of recreational fishing opportunities afforded and hence, the competitiveness of a particular destination vis-a-vis other nations which feature outstanding billfish angling opportunities (see Ritchie 1995 for a listing of the world's top 20 billfish angling destinations). Further, if domestic and foreign commercial fishermen are allowed to deplete billfish through directed harvest or bycatch to a level where anglers no longer feel they have a reasonable chance of catching billfish, the social and economic benefits documented in previous studies of the recreational billfish

fishery in the Caribbean (Ditton and Fisher 1990; Ditton and Clark 1994) are in jeopardy.

Increasingly, billfish anglers are attempting to act reponsibly. Many have practiced catch and release philosophy and technique for some time; others have been persuaded to adopt this orientation. Most billfish caught by anglers in the U.S. Atlantic ocean (including the Caribbean) and in Puerto Rico were released alive (Ditton and Fisher 1990; Ditton and Clark 1994). The motivation for this release behavior is clear; anglers are interested in the experience of pursuing and catching large billfish rather than harvesting them. Increasingly, however, this recreational activity is threatened by commercial fishing which is by definition interseted solely in harvesting fish. For many nations, the utilitarian and appreciative values of commercial and recreational fisheries, respectively, are on a collision course. Hence, some political jurisdictions in the U.S. and elsewhere are making allocation decisions on the basis of the "best available social and economic data" to protect what is widely perceived as the much more valuable benefits associated with recreational fisheries. They are implementing risk adverse management regimes which promote sustainability and optimum yield benefits over time rather than overexploitation.

This paper will focus on recreational billfisheries from a sustainable ecotourism perspective. This paper will provide several established definitions of ecotourism and identify the essential ingredients so the benefits of billfish angling can be better understood by both tourism and fisheries management officials alike. Further, it will present pro and con arguments that recreational billfish angling qualifies as ecotourism a concept usually reserved solely for nonconsumptive activities.

THE SHIFT TO TOURISM DEVELOPMENT

Natural resources have historically been the source of economic well-being. Basic industries such as mining, agriculture, commercial fishing, and livestock production extract resources, process and then market them to generate economic benefits. In many post-industrial cultures, the travel and tourism industry has surpassed these basic industries in total employment and economic impact and is seen as a source of income for many developing countries. Tourism as an industry is generally recognized to consist of tourists, transportation, destinations-attractions, lodging and food services, and information services. The most successful tourism developments involve partnerships between the public and private sectors (Gunn 1992). The travel and tourism industry is generally recognized to be among the top three generators of economic activity for most developed nations (along with agriculture and medical services) (Fridgen 1994). According to the World Tourism Organization, tourism comprises 7% of the world's trade in goods and services and annually produces $195 billion in domestic and international receipts (Kallen 1990). The developing nations

currently reap $55 billion in tourism revenue (Westlake 1989). However, mass tourism requires substantial infrastructure development that is often beyond the capabilities of many destinations.

Modern tourism has evolved from religious pilgrimages and a limited market of elite class young men who "toured the continent" in European cities to "mass tourism" based on a state of relative peace between nations, the widespread availability of auto and rail travel, and relatively cheap and rapid air travel starting in the 1970's. There are some who believe the rise in ecotourism is, in part, a reaction to mass tourism with it's relatively impersonal and alienated interactions between host and guest and the rejection of a "herd mentality" of participation in huge jets, large hotels, urban attractions, and destinations with a disheartening sameness to city life with its attendant negative impacts on the environment.

ECOTOURISM DEFINED

Ecotourism has been differentially labeled as "nature tourism", "sustainable development", or "green travel". Although the labels are new, nature-based travel is not. For example, travel to national parks promoted by railroad companies, travel to observe birds and alligators in Florida (Derr 1989), and safaris to Africa and India all have existed since the late 19th century (Carr and Wilson 1994; Wall 1994). Even with a heritage of outdoor travel, there is not question that there is new interest in the concept and potential of nature-based travel. What is it that gives ecotourism it's uniqueness as a tourism product?

One definition of ecoutourism is: "nature-oriented travel by outdoor lovers" (Kretchman and Eagles 1990). This definition focuses on the type of product and type of consumer. Generally, the classis ecotourism product is a wildlife oriented tour. Typically some type of "exotic" and different wildlife than the tourist has access to at home. Examples include Kenya's Ambosli Game Reserve with elephants, rhinos and leopards (Olindo 1961), the Galapagos Islands with giant tortoises and iguanas, birds such as the Roseseate Spponbills or Sandhill cranes at Merritt Island Wildlife Refuge, and moose, elk and bear in Alaska. In some cases, the product is not as specifically focused on wildlife as on wild, natural experiences such as an Amazon river trip or a raft trip on the Colorado river through the Grand Canyon. Ecotourism products have also come to include aboriginal peoples, their cultures and their communities, be they historic or contemporary, such as the Inca pyramids in Mexico or Lakota Sioux in the Black Hills of the United States. Thus, the product may be varied but there is a common theme of a "natural (or pre-modern cultural) attraction", generally different from what is seen at home (implying a travel requirement) and usually in a relatively undeveloped, natural environment. Inherent in this is the connotation of exposure to the elements of weather, natural sounds and smells, and the lack of large numbers of people.

The second part of this definition refers to "outdoor lovers". This can generally be differentiated into younger, adventure oriented thrill-seeking customers and middle-aged to older educationally and relaxation oriented travelers. Surveys of ecotourists have indicated that they are more highly educated and wealthier than other travelers, who are already higher than average in both categories compared to non-travelers in their respective cultures. Over one-half of the U.S. population reports observing or interacting with wildlife during the year (USFWS 1991). This sense of appreciation for the outdoors stems from many roots such as a rural upbringing, nostalgic memories of outdoor adventures with family or peer groups, denial of the pleasant stimuli of natural environments due to urban lifestyles, or an appreciation of the incredible variety of species on the planet as well as many other motives.

Another definition adds the dimension of nature-sensitive traveller behavior: "tourism with an emphasis on travelers being especially respectful of an area and as unobtrusive as possible" (Adler 1990). To some extent, this might be expected of "nature lovers". However, due to ignorance about the impact of the purchase of some products that exploit a distant species or unawareness of the aggregate impacts of thousands of tourists (*e.g.*, stress on animals, sewage system overload, cultural imperialism, etc.) or the effects of some types (*e.g.*, multi-national) of tourism development on indigenous communities (*e.g.*, use of non-native labor or goods), there is a need for trip planners to assist travelers in being aware of potential impacts. This distinction is made in a third definition: "travel that is planned and performed in an environmentally and socially aware manner" (Ashton 1991). Here the emphasis is on the planner and trip leader, who has a duty to be informed enough about the local resources and carrying capacity limits to assist the tourist in minimizing his or her impacts on the resource. Hosts often arrange accomodations, local travel, meals, and sightseeing opportunities that are as unobtrusive as possible on the resource. This could include the imposition of limits, as needed, to insure this.

A fourth definition proposes that ecotourism is "the point at which capitalism and conservation join together to fight for the same cause: wildlife preservation at a profit" (Ashton 1989). This adds the specific point that careful use of natural resources either through preservation or renewable management can produce greater income than single point, non-renewable exploitation (*e.g.*, consumption) or displacement of that natural resource for another use (*e.g.*, agriculture). For example, a herd of elephants packaged as part of an ecotour package would likely generate many times the income over their lifespan as an attraction than if they were harvested once for their tusks and meat. In this view, the resource is still perceived in a utilitarian manner, but as a tourist attraction. Its value lies in the economic impact it produces, not its ecosystem or inherent value. Its profit potential as an attraction exceeds its profit as a consumable product.

Finally, a fifth definition adds a responsibility component: "Nature travel that advances conservation and sustainable development efforts" (Boo 1992). Here, the element of advancing the cause of conservation of the resource is added. In more recent thinking about ecotourism attractions, this refers to a portion of the income from tourists being spent on the direct conservation or sustainability of the resource. This can include the purchase of habitat property by buying out settlers, providing alternative economic development opportunities for local residents, educational efforts to raise awareness of the value of the resource and the ecosystem, restoration efforts, and many other initiatives.

Other definitions combine elements of several of those mentioned above: "part of a planned program with educational components that generate money to benefit conservation efforts for the sites visited, as well as economic development for local inhabitants" (Ziffer, 1989); or, " responsible travel to natural areas that conserves the invironment and sustains the well being of local peoples" (Blangy and Wood 1993); or, "a new kind of mature tourism where travelers are schooled in cultural and ecological sensitivity, where their tour company supports conservation... and where a large share of the cash remains in the rural areas" (Warner 1989).

MAJOR ELEMENTS OF ECOTOURISM

This collection of definitions has led in a variety of directions (Backman *et al.*, 1994). What are the core concepts that most writers include in their definitions? To begin with, a natural resource based product consisting of a natural (often times, near wilderness) setting with a specific focus (*i.e.*, specific plant or animal species). If the attraction is something other than a natural resource (*i.e.*, wild) entity or an anthropological primitive culture, the experience does not quality as ecotourism. Usually, the primary attraction is relatively unique and found in a limited number of locations, so much so, that the species or culture is often threatened or endangered.

The second major component is people interested in the product (*i.e.* potential market demand). Depending on the type of product, these are generally students, natural history buffs, novice scientists, outdoor recreationists, and people with curiosity and a desire to explore the natural environment. Beyond these desires, the potential ecotourist must also have the motivation and means to seek out the more unique resources. This means that they must be willing to give up other opportunities to place natural resource interaction at a level of priority in their life. It also means they must have access to travel opportunities to transport them to the location of the natural attraction.

This leads to a third primary characteristic, that they be tourists. This is important for several reasons. First, if they are local residents, the liklihood is that the resource is not appreciated at the same level because it is relatively

easily accessible. Therefore, willingness to contribute to its preservation is less likely. Most important, though, is the criteria that as a tourist, new monies are being imported to the region (as opposed to a resident simply shifting expenditure categories within their home region (*e.g.*, going whale watching instead of the theater). A major value of tourism is its economic impact due to money entering an economy from an outside origin. The effect is only possible, if the source of the money is from a non-resident, most often, a tourist.

A fourth characteristic that is inherent in the tourist criteria is that a travel component is required. Without travel, important prerequisites such as being a tourist, seeking a unique natural resource based product or experience that differs from the client's everyday experience, and being a carrier of outside money are essentially impossible. Travel also adds an important element of adventure, usually of interest to the eco-traveller, especially if it involves transportation modes not regularly utilized by the participant.

These four criteria (a natural product with potential customers seeking that product who are tourists which travel) are major prerequisites to the existence of ecotourism. Beyond these basics, are three conditions that more enlightened tourism promoters insist on being present in the "true" ecotourism experience. There is less agreement on the need for all three of these to be present; however, most ecotourism planners would prefer that the following aspects be present to some degree (Lindberg and Hawkins 1993). Some observers of the phenomenon have insisted on an "educational" dimension to the experience (Blangy and Wood 1993; Whelan 1991). Unless the participant learns about the resource and the potential threats facing it, an opportunity to promote the future conservation of that resource, directly by that client and other people they may be in contact with, has been lost. Given that most ecotourism trips are experiential by design, experiential learning is also inherent in the design. To what extent more formal "factual" information transfer is required to debateable.

Another condition specified by some observers is that a portion of the profits generated from the ecotourist customer be spent on conserving the resource (Boo 1992). This is the primary motivation why so many conservation organizations, and natural resource managers are interested in ecotourism. In this period of declining government support for natural resource projects, and competition for various environmental causes, the ecotourism privatization alternative offers a partial, if not total, solution. For the ecotourism potential to be perpetuated, the natural resource must be preserved from alternative uses. This is only possible if monies are available to accomplish this.

A third condition insisted upon by socially conscious observers is the provision of employment and entrepreneurial opportunities for local people (Fennell and Eagles 1990). This usually implies that the business scale is smaller in scope than other forms of tourism (Hvenegaard 1994; Wright 1993). Local people may have previously depended on the consumptive use of the resource for

sussistence. If they are to be expected to shift to preserving the resource for the enjoyment or education of non-locals, there should be an incentive and opportunity for them to continue to thrive, by earning alternative income from tourists that substitutes for their previous revenue sources.

BILLFISH ANGLING AS ECOTOURISM

Billfish angling occurs worldwide wherever there is sufficient billfish abundance, angler demand and adequate infrastructure available for access purposes. Unfortunately, the number and distribution of individuals who participate in billfish angling is not known.

Whether or not billfish angling is an ecotourism activity depends first on whether or not it is consumptive recreation activity. A survey of billfish tournament anglers in the U.S. Atlantic (including the Caribbean) revealed a self-reported catch rate of 89% (Ditton and Fisher 1990). On average, in this fishery, each angler kept one billfish per year. In actuality, however, 29% of this group of tournament anglers accounted for 100% of the billfish brought to the dock. Among tournament billfish anglers in Puerto Rico, release rates were 72% and 87% for residents and non-residents, respectively. This difference can best be explained by differences in angler motivations for fishing (or the social meaning of recreational fishing) and by whether or not they had been exposed to the thinking of their peers in fisheries conservation organizations such as the Billfish Foundation and the International Gamefish Association. Less than one-half (42%) of the resident billfish anglers belonged to these groups contrasted with 81% of the non-residents coming to Puerto Rico to fish.

Much has changed in recent years in the billfish tournament fishing community. Previously, it was common to see most of the billfish caught regardless of size brought to the dock for weigh-in at tournaments. This is no longer socially acceptable among billfish anglers or to the public. Consequently, tournament rules have been modified and new technologies have emerged to make "no kill" tournaments feasible. Today, most billfish tournaments emphasize catch and release fishing, tagging fish in support of scientific endeavors, and fund-raising for billfish research and conservation purposes.

In a study of charter boat billfish anglers in Costa Rica, we documented a self-reported release rate of 97%. Even more so than previously documented, billfish angling is an activity which emphasizes intrinsic rather than extrinsic values, *i.e.*, nature appreciation, challenge, adventure and excitement, and the experience of the catch. It is an appreciative form of recreational fishing whereby the emphasis is clearly on non-consumptive elements. Billfish anglers in Costa Rica were even more likely than other groups of billfish anglers studied previously to support billfish management options which emphasize environmental protection and ethical participation by anglers. Most billfish anglers supported catch and release only fishing (zero bag limit) (86.4%),

mandatory "no kill" tournaments (85.2%), minimum sizes for billfish (77.7%) and a ban on stainless steel hooks (53.3%). Furthermore, most opposed allowing handlining and harpooning for recreational purposes (83.6%), and supported a one fish bag limit per boat (52.8%), and a one fish bag limit per person (52.8%) (Ditton and Grimes 1995). We observed considerable homogeneity among billfish anglers in Costa Rica on conservation and management issues (Ditton and Grimes 1995). This could be attributed to the nation's overall ecotourism orientation of the charter boat operators who explicitly promote catch and release fishing and ethical fishing techniques as norms for their customers. Or, is it possible that overall average trip costs ($3,446 US), and the operator's orientation to the recreational business attracted a particular segment of billfish anglers in contrast with other areas without such an orientation (Ditton and Grimes 1995). Overall, research reverals a temporal trend of fewer billfish being brought to the dock by anglers and variation in release rates by geographic location. As billfish release rates increase, and catch related mortality decreases through more attention to techniques, billfish angling is moving toward becoming a non-consumptive use of natural resources.

As a group, billfish anglers are highly educated, have high annual household incomes, and have a high level of involvement in recreational fishing. The median educational level of non-resident anglers in Puerto Rico was four years of college; the median income category was $90,000-$99,000 (Ditton and Clark 1994). The median education level of billfish anglers in Costa Rica was one year of graduate school; the median income category was $160,000 (US) with 43% reporting incomes of $200,000 or more (Ditton and Grimes 1995). This group of anglers in the U.S. Atlantic (including the Caribbean), Puerto Rico, and Costa Rica had an average of 11, 16, and 14 years of billfish fishing experience, respectively. Overall, they reported an average of 26, 24, and 25 years of saltwater fishing experience, respectively. Also, they reported 44, 38, and 40 days of fishing in the previous 12 months, considerably higher than for saltwater anglers in general. In Puerto Rico, most non-resident (84%) billfish anglers rated fishing as their most important outdoor recreation activity (Ditton and Clark 1994). Over one-half of the billfish anglers (61%) in Costa Rica rated fishing as their most important outdoor recreation activity (Ditton and Grimes 1995).

Billfish angling is a source of income to small local economies. In Puerto Rico, for example, non-resident anglers spent $4,459,270 (Ditton and Clark 1990) or an equivalent of $2,132 for each billfish caught. These expenditures are considered new monies which increase the area's economic base and produce economic impacts (Milon and Thunberg 1993). Usually, the purchase of goods and services by anglers transfer money to local merchants, who in turn, spend the money for goods and services necessary to maintain their business. This re-spending is an indirect economic impact of fishing. This money may again be spent locally, or used to purchase goods and services from outside the local economy.

In Puerto Rico, direct expenditures were made at locations where there were marinas and other fishery related infrastructure. Unfortunately, due to the direct economic dependence of Puerto Rico on the mainland U.S. economy, those who received money from anglers almost immediately purchased imported goods and services with it. Thus, total non-resident angler expenditures of $4,031,778 (excluding air fare) had an economic impact of only $4,314,002 on the Puerto Rican economy or approximately 170 jobs for local residents (Ditton and Clark 1994). In contrast, a total direct expenditure of $8,880,986 (excluding airfare) by non-resident billfish anglers in Costa Rica had a total economic impact of $17,761,972. A higher economic multiplier was used because expenditures for goods and services remain in the national economy for several rounds of spending. Thus, economic activity was generated by anglers going billfishing on one of 88 charter vessels available for hire; on average, each charter boat was responsible for $201,840 of the total economic impact attributable to billfish angling. These 88 boats were owned by approximately 50 small businesses and are located in coastal communities with relatively small populations. While several boats employed U.S. citizens as captains, many did not. Most captains have hired crew members who were commercial fishermen in local communities and have provided training to enhance their boat and fishing-related skills. Many crew members hope to acquire the requisite skills that will allow them to become boat captains some day. Many others in local communities have jobs attributable to the high levels of expenditures associated with billfish angling. These jobs will continue to exist as long as efforts are successful to maintain abundant billfish stocks in support of sustainable recreational fisheries.

Finally, many anglers work to benefit billfish species and the ecosystems upon which they depend. Most billfish anglers belong to one or more fisheries conservation organizations, *i.e.*, the Billfish Foundation, Game Conservation International, International Game Fish Association, and the National Coalition for Marine Conservation, among others, which seek to influence policies that impact billfish abundance at national and international levels. About 80%, 81%, and 61% of the billfish anglers in the U.S. Atlantic, and non-residents in Puerto Rico and Costa Rica, respectively, belonged to one or more fisheries conservation organizations. This contrasts sharply with anglers overall in the U.S., for example, where less than 10% belong to fishery related organizations. With government funds in short supply for billfish research and management, these organizations frequently make contributions to support these acitvities. Without these contributions, these activities would likely go unfunded.

CONCLUSIONS

Recreational fishing has generally not been viewed as ecotourism because it is consumptive in orientation. Most ecotourism applications have focused on nonconsumptive activities such as birding and nature study and in parks or

reserves in terrestrial environments. Many of the activities traditionally associated with ecotourism can fail to qualify as such when it comes to the specifics of how the activity is conducted. Therefore, it is not the type of activity per se that qualifies it as ecotourism but the specific nature of the human behaviors involved, the distribution of economic benefits, and the associated social and environmental impacts.

To the extent that billfish angling meets the various criteria established in the aforementioned definitions, it may be considered as ecotourism. Like birding and other supposedly nonconsumptive recreational activities, billfish angling does not always qualify as ecotourism. A case was made that billfish angling in the U.S. Atlantic (including the Caribbean) and Puerto Rico qualifies more or less as ecotourism. An even stronger case was made for billfish angling in Costa Rica. While there may be other locales where billfish angling would not meet the various definitions of ecotourism, there is increasing peer pressure within this angler social world to minimize the negative impacts of recreational fishing and reinforce the positive impacts.

Ecotourism is as concerned with social impacts on local populations as it is with environmental impacts. Concern extends well beyond how recreational fishing is conducted to include those who benefit directly and indirectly from thsi activity. The social and economic activities associated with billfish angling make the conservation and wise use of billfish resources a relevant topic of concern for local people. Further efforts are needed to evaluate the specific extent to which angler expenditures benefit people in the local community as well as create unintended social costs. Likewise, additional research is needed to determine the likely extent of release mortality associated with the catch and release of billfish species. Until more is known about the release mortality of billfish, it will be difficult to sustain the point that catch and release billfish angling is a non-consumptive use of resources. However, if this issue can be resolved, it is clear that billfishing, in some cases, can be regarded as ecotourism.

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