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Beyond Catch Success: Environmental Values Shape Sport Fishing Tourism in Costa Rica

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ABSTRACT

Introduction: Recreational fisheries are expanding globally, generating both economic opportunities and ecological challenges. Understanding how anglers value environmental attributes is therefore essential for sustainable tourism development and effective fisheries governance.

Objectives: This study assessed how U.S. and Canadian anglers in Costa Rica value biodiversity, ocean cleanliness, and conservation, and examined the relationship between these valuations, overall satisfaction, and intention to return.

Methods: A structured survey was conducted between December 2024 and April 2025 at three Pacific marinas and a fishing lodge (n = 407). Respondents evaluated environmental and cultural attributes, fishing outcomes, and perceptions of fisheries regulations. Data was analyzed using descriptive statistics, chi-square tests, and Cramér's V to compare angler experience groups.

Results: More than 85 % of respondents rated biodiversity, ocean cleanliness, and conservation as “very important.” Expert fishers assigned significantly higher importance than tournament fishers to ocean cleanliness, biodiversity protection, and scenic beauty (χ^2 , $p < 0.05$; Cramér's V = 0.18–0.22), while no significant differences were observed for conservation efforts. Intention to return was strongly associated with higher environmental valuation: more than 90 % of anglers in the top tercile reported plans to revisit Costa Rica, compared with fewer than 70 % in the lowest tercile.

Conclusions: Environmental attributes are central to the satisfaction of U.S. and Canadian anglers in Costa Rica, contrasting with findings of North American studies where catch outcomes tend to dominate. Protecting billfish populations and consolidating best practices, including inclusive initiatives to attract women anglers, are critical for maintaining Costa Rica's ecological integrity and tourism competitiveness.

Key words: ecotourism; environmental awareness; marine conservation; recreational fisheries; sustainability.



RESUMEN

Más allá del éxito en la captura: los valores ambientales modelan el turismo de pesca deportiva en Costa Rica

Introducción: La pesca deportiva se está expandiendo a nivel mundial, generando tanto oportunidades económicas como desafíos ecológicos. Por ello, comprender cómo los pescadores valoran los atributos ambientales resulta esencial para el desarrollo de un turismo sostenible y una gobernanza eficaz de las pesquerías.

Objetivos: Este estudio evaluó cómo los pescadores deportivos de Estados Unidos y Canadá, en Costa Rica, valoran la biodiversidad, la limpieza del océano y la conservación, y examinó la relación entre estos factores, la satisfacción general y la intención de regresar.

Métodos: Se aplicó una encuesta estructurada entre diciembre de 2024 y abril de 2025 en tres marinas del Pacífico y un lodge de pesca ($n = 407$). Los encuestados evaluaron atributos ambientales y culturales, resultados de la pesca, y percepciones sobre las regulaciones pesqueras. Los datos se analizaron mediante estadísticas descriptivas, pruebas de chi-cuadrado y el coeficiente V de Cramér para comparar grupos según la experiencia de los pescadores.

Resultados: Más del 85 % de los encuestados calificó la biodiversidad, la limpieza del océano y la conservación como “muy importantes”. Los pescadores expertos asignaron una importancia significativamente mayor que los pescadores de torneo a la limpieza del océano, la protección de la biodiversidad y la belleza escénica (χ^2 , $p < 0.05$), mientras que no se encontraron diferencias significativas en cuanto a los esfuerzos de conservación. La intención de regresar se asoció fuertemente con una mayor valoración ambiental: más del 90 % de los pescadores ubicados en el tercil superior del índice reportó planes de volver a Costa Rica, en comparación con menos del 70 % en el tercil inferior.

Conclusiones: Los atributos ambientales son centrales para la satisfacción de los pescadores deportivos de Estados Unidos y Canadá en Costa Rica, en contraste con los hallazgos de estudios en América del Norte, donde los resultados de la captura tienden a predominar. Proteger las poblaciones de peces picudos y consolidar buenas prácticas —incluidas iniciativas inclusivas para atraer a mujeres pescadoras— es fundamental para mantener la integridad ecológica de Costa Rica y su competitividad turística.

Palabras clave: ecoturismo; conciencia medioambiental; conservación marina; pesca deportiva; sostenibilidad.

INTRODUCTION

Recreational fisheries, defined as fishing activities undertaken primarily for leisure rather than for subsistence or commercial purposes, are expanding worldwide, involving millions of participants and generating significant economic and ecological impacts (Babali et al., 2018; Mandal et al., 2018). Research consistently shows that catch-related factors such as fish size, number, and harvest success are dominant drivers of angler satisfaction, while environmental attributes tend to play a less consistent role at the aggregate level (Birdsong et al., 2021). Despite their non-commercial nature, recreational fisheries can exert measurable environmental pressures, including localized stock depletion, post-release mortality, habitat disturbance, and cumulative ecosystem effects, particularly when participation levels

are high or management is weak (Granek et al., 2008; Lewin et al., 2019). Studies in North America nevertheless highlight substantial heterogeneity among anglers: although catch outcomes generally remain central, some anglers place greater emphasis on environmental experiences, while others prioritize catch outcomes, and motivations often shift with angler specialization or over time (Birdsong, 2023; Birdsong et al., 2021; Golebie, 2017; Hunt et al., 2019; Oh & Ditton, 2008; Schramm & Gerard, 2004). These dynamics underscore the importance of conceptualizing recreational fisheries as socio-ecological systems, in which angler behavior, ecological outcomes, and governance arrangements are tightly linked. This interdependence reinforces the need for effective management to balance recreational benefits with conservation objectives. Understanding when and how environmental attributes shape angler satisfaction

is therefore crucial for conservation-oriented management.

In Latin America, recreational fisheries have expanded alongside tourism, emphasizing the influence of social and ecological contexts on anglers' experiences. Studies in Mexico have documented both the economic valuation of sport fishing and shifts in angler profiles (Almendarez-Hernández, 2023; Almendarez-Hernández et al., 2020). In Argentina, research on marine and coastal recreational fisheries highlights their contributions to tourism economies, angler expenditures, and the diversification of coastal livelihoods, as well as the relevance of governance and monitoring frameworks (García et al., 2022; Venerus & Cedrola, 2017; Zumpano et al., 2024). In Brazil, baseline studies revealed heterogeneous motivations across coastal and competitive fisheries (Freire et al., 2020; Freire & Rocha, 2020). Comparative perspectives further illustrate how governance and community linkages shape perceptions of sustainability (Denkinger & Vinueza, 2014; Southwick et al., 2013). Taken together, these studies emphasize the socioeconomic and governance dimensions of recreational fisheries across Latin America, while comparatively less attention has been paid to how international anglers perceive environmental quality in tropical destinations. This gap highlights the need to examine how international anglers perceive environmental quality in tropical destinations such as Costa Rica.

Beyond its touristic image, Costa Rica is widely recognized as a global conservation brand. Since the 1990s, the country has promoted itself as a "green destination" built on biodiversity conservation and sustainability (Chen Mok, 2012, Chen Mok, 2014; Otoyá, 2019). This reputation is reinforced by national governance frameworks (Cajiao, 2019; Estrategia Nacional para la Gestión Integral de los Recursos Marinos y Costeros de Costa Rica, 2008; Marchena Sanabria et al., 2024), and by the development of best-practice guidelines (Federación Costarricense de Pesca [FECOP], 2022, FECOP, 2023; FECOP, 2024). This

environmental reputation is also closely linked to the conservation of emblematic species.

Costa Rica is also a hotspot for billfish conservation: the Eastern Tropical Pacific sustains some of the highest catch rates of sailfish (*Istiophorus platypterus*) and marlin (*Makaira spp.*, *Kajikia audax*), species that are central to catch-and-release tourism (Díaz-Uribe et al., 2023). Nonetheless, long-term monitoring has shown sharp declines in sailfish abundance, accompanied by reductions in trophy sizes (Ehrhardt & Fitchett, 2006; FECOP, 2022; Marrari et al., 2023; Ramírez, 2014). These trends have prompted management responses, including the Costa Rican Institute of Fisheries and Aquaculture's board agreement AJDIP-280-2014 regulating live bait use, and have stimulated sustained advocacy by non-governmental organizations (NGOs) and scientists (Alfaro Rodríguez, 2022; Jiménez Ramón, 2023; Ley 8436, 2005).

Despite this strong reputation, little is known about how international anglers perceive the environmental quality and conservation measures that sustain sport fishing in Costa Rica. Evidence from the United States and Canada indicates that sustainability is seldom ranked as a primary driver of satisfaction, with anglers tending to prioritize catch outcomes and access (Birdsong et al., 2021; Ihde et al., 2011; van den Heuvel & Rönnbäck, 2023; Young et al., 2020; Young et al., 2016). Whether these priorities shift when anglers fish in Costa Rica, a country explicitly branded around sustainability, remains unclear.

This study examined how U.S. and Canadian anglers value environmental aspects of sport fishing in Costa Rica – especially biodiversity, ocean cleanliness, and conservation efforts – and how these perceptions relate to satisfaction and intention to return. Focusing on these anglers reflects their prominence within the international sport fishing market operating in Costa Rican marinas and lodges, making them a particularly relevant group for examining conservation-related perceptions in this context. The findings contribute to a broader understanding of how destination

context shapes angler priorities and advance knowledge at the interface of tropical fisheries, tourism, and conservation governance.

MATERIALS AND METHODS

Study area: Data were collected at four major recreational fishing sites along Costa Rica's Pacific coast: Marina Pez Vela (Quepos), Los Sueños Resort & Marina (Herradura), Crocodile Bay Resort (Puerto Jiménez), and Marina Flamingo (Guanacaste) (Fig. 1). Fishing activity at all sites is predominantly boat-based offshore sport fishing, conducted using charter vessels operating from marinas or lodges. Anglers primarily target pelagic species, particularly sailfish (*Istiophorus platypterus*) and marlin species, using rod-and-reel gear with live bait or artificial lures, consistent with regional billfish fisheries. These sites host international anglers, provide established fishing infrastructure, and coincide with regional billfish tournaments. Although the sites differ in geographic setting and local fleet composition,

they share comparable fishing practices and target species, allowing results to be analyzed within a common recreational fishing context.

Sampling design: The survey targeted U.S. and Canadian tourists engaged in sport fishing in Costa Rica. Costa Rican citizens were excluded, while expatriates from the U.S. and Canada residing in the country were eligible. This focus was adopted to specifically examine international sport fishing tourism, for which satisfaction and intention to return are closely linked to destination competitiveness and travel-related decision-making. Fieldwork was conducted from December 7, 2024, to April 6, 2025, during the billfish high season. A total of 466 surveys were administered, yielding 407 valid responses (margin of error $\pm 4.9\%$ at 95 % confidence).

Survey Instrument: The questionnaire was developed by Texas Tech University and implemented using Qualtrics (Qualtrics, Provo, UT, USA). It included both categorical and

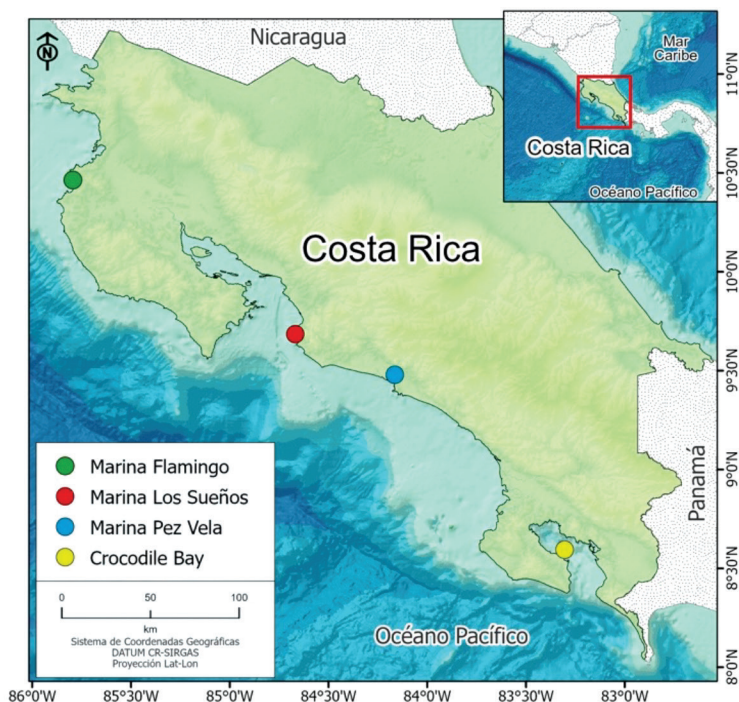


Fig. 1. Location of survey sites in Costa Rica (Flamingo, Los Sueños, Pez Vela, and Crocodile Bay), 2024-2025 fishing season.

Likert-type items (Joshi et al., 2015) and covered the following domains: (1) basic socio-demographic information, including country of residence and visitation history; (2) fishing behavior and specialization; (3) motivations and satisfaction drivers; (4) evaluation of environmental and cultural attributes (e.g., biodiversity, ocean cleanliness, conservation, safety, political stability); (5) perceptions of regulations and conservation practices (e.g., support for laws and awareness of catch-and-release norms); and (6) future intentions, including the likelihood of returning to Costa Rica. A pilot test was conducted to refine wording and survey duration. The complete questionnaire is available as Supplementary Material 1 (PDF). Results presented in this article focus on survey items related to environmental valuation, satisfaction, regulatory perceptions, and intention to return.

Fieldwork: Surveys were administered in person by trained bilingual interviewers at marinas and a fishing lodge. Responses were recorded using Qualtrics, with offline storage employed when internet connectivity was limited. All participants were informed of study objectives, and anonymity was assured.

Angler segmentation: For statistical purposes, respondents self-identified into one of six experience categories: Novice, Casual Fisher, Regular Weekend Fisher, Hardcore Fisher, Tournament Fisher, and Expert Fisher. These self-reported categories constituted the primary segmentation used in the analysis. To improve statistical robustness, categories were grouped into two composite groups: (1) Less Experienced (Novice, Casual, Regular Weekend) and (2) More Experienced (Hardcore, Tournament, Expert). This aggregation was applied exclusively for inferential analyses requiring larger cell sizes and did not replace the original six-category classification.

Within each of these composite groups, three distinct profiles were retained, resulting in six angler profiles. Behavioral variables, including fishing types, overall time spent

fishing, time devoted specifically to sport fishing, and prior international fishing experience, were used to further characterize these profiles rather than to define new segments. These variables were analyzed comparatively across profiles to assess consistency between self-identified experience levels and observed fishing behaviors; no predefined thresholds or reclassification rules were applied.

Segmentation was not derived using multivariate statistical clustering techniques. Instead, self-identified experience categories were contextualized and descriptively validated using behavioral variables, including fishing modalities, overall time spent fishing, time devoted to sport fishing activities, and prior international fishing experience. These variables were used to assess internal consistency across experience levels rather than to generate new segments.

Basic sociodemographic variables (e.g., age group and country of residence) were collected as part of the survey but were not used for segmentation, as the study aimed to classify anglers based on experience and behavior rather than demographic characteristics.

Data processing and analysis

Data collection, initial cleaning, and descriptive tabulations were conducted by Ipsos, an international research firm specializing in survey-based studies, as part of the original *Sport Fishing Satisfaction Research Study*. These steps included validation of completed questionnaires and preparation of cleaned datasets for analysis. All analytical procedures and outputs were subsequently reviewed by the research team prior to statistical analysis. Descriptive statistics were used to summarize key variables. Group comparisons by nationality (U.S. vs. Canada) and angler experience were performed using chi-square (χ^2) tests of independence, with effect sizes reported as Cramér's V (Telford et al., 2020). For continuous variables or composite indices, internal consistency was assessed using Cronbach's α (Bonett & Wright, 2015). Analyses were conducted in IBM SPSS Statistics v29 (IBM Corp., Armonk,



NY, USA) and cross-validated using Microsoft Excel (Microsoft Corp., Redmond, WA, USA), following the analytical procedures established for the study.

Ethical compliance

Participation was voluntary and based on informed consent. The study complied with the ethical guidelines of the Revista de Biología Tropical and with international standards for social science research, consistent with the principals of the Declaration of Helsinki. Participation was anonymous, non-invasive, and did not involve the collection of personal or sensitive information.

RESULTS

Categories of anglers that participated in the study

Respondents self-identified across six self-reported categories as follows: Novice (11 %), Casual Fisher (14 %), Regular Weekend Fisher (16 %), Hardcore Fisher (23 %), Tournament Fisher (19 %), and Expert Fisher (16 %). For analytical purposes, these categories were grouped into two composite groups: Less Experienced (42 %) and More Experienced (58 %) anglers. The detailed distribution across categories is presented in Table 1.

Angler satisfaction with environmental and catch-related fishing attributes

Satisfaction scores, derived from survey items evaluating environmental and catch-related fishing attributes and expressed as Top-Three-Box (T3B: very, moderately, or slightly satisfied) responses, ranged from 64 % to 79 %. Peacefulness of fishing sites and cleanliness received the highest proportions of satisfied respondents, whereas average catch weight and number of billfish released received the lowest scores (Table 2).

Table 2

Satisfaction of U.S. and Canadian anglers with environmental and catch-related attributes of sport fishing in Costa Rica, expressed as Top-Three-Box (T3B) responses (December 2024–April 2025). Percentages are rounded to whole numbers and subject to a ± 4.9 % margin of error (95 % CI).

Attribute evaluated	n	T3B (%)
Peacefulness of fishing sites	322	79
Cleanliness of fishing sites	301	74
Ability to catch desired species	277	68
Fighting quality of fish	277	68
Total number of fish harvested/released	265	65
Average length of fish caught	265	65
Average weight of fish caught	261	64
Number of billfish released	261	64
Total respondents	407	—

Table 1

Distribution of U.S. and Canadian anglers surveyed in Costa Rica by self-identified experience level and composite grouping (December 2024–April 2025). Categories are self-identified and grouped for analytical purposes; percentages are rounded and subject to ± 4.9 % margin of error (95 % CI).

Angler group	Category	n	% of sample
Less experienced (42%)	Novice	45	11
	Casual fisher	57	14
	Regular weekend fisher	65	16
More experienced (58%)	Hardcore fisher	34	23
	Tournament fisher	77	19
	Expert fisher	65	16
Total	—	407	100

Support of sport fishing regulations

Overall, 76 % of respondents expressed support for sport fishing regulations (T3B). Support varied slightly across experience levels, ranging from 72 % among Casual fishers to 79 % among Hardcore and Expert fishers (Table 3).

Environmental attribute importance

Environmental attributes were consistently rated as “very important,” with proportions between 85.7 % and 89.4 %. Conservation efforts and sustainable practices received the highest rating, followed closely by ocean cleanliness, biodiversity protection, and scenic beauty (Table 4). Percentages are reported with the overall survey margin of error (± 4.9 %, 95 % CI).

Expert fishers consistently assigned higher importance than Tournament fishers to ocean cleanliness, biodiversity protection, and scenic

beauty, whereas differences in conservation efforts were not statistically significant (Table 5).

Environmental valuation and intention to return

Intention to revisit Costa Rica varied across levels of environmental valuation. More than 90 % of respondents in the highest tercile of the environmental valuation index reported an intention to return, compared with fewer than 70 % among those in the lowest tercile. Percentages are reported with the overall survey margin of error (± 4.9 %, 95 % CI).

DISCUSSION

Surveyed U.S. and Canadian anglers in Costa Rica consistently rated biodiversity, ocean cleanliness, and conservation as very important attributes of their fishing experience. This contrasts with findings from North

Table 3

Support for sport fishing regulations among U.S. and Canadian anglers in Costa Rica, expressed as Top-Three-Box (T3B) responses by experience segment. V Percentages are rounded to whole numbers; n values represent estimated counts derived from observed T3B percentages. Estimates are subject to a ± 4.9 % margin of error (95 % CI).

Angler group	Category	Estimated supportive respondents (n)	T3B support (%)
Less experienced	Novice	30	73
	Casual fisher	29	72
	Regular weekend fisher	51	78
More experienced	Hardcore fisher	74	79
	Tournament fisher	56	73
	Expert fisher	63	79
All respondents	—	303	76

Table 4

Importance of environmental attributes for U.S. and Canadian anglers in Costa Rica, based on survey responses rating each attribute as “very important” (December 2024–April 2025). Percentages are rounded to one decimal place and subject to a ± 4.9 % margin of error (95 % CI).

Attribute	n	% “very important”
Conservation efforts / sustainable practices	364	89.4
Ocean cleanliness	363	89.1
Biodiversity protection / wildlife conservation	357	87.8
Scenic beauty	349	85.7



Table 5

Comparison of environmental attribute importance between Expert and Tournament anglers in Costa Rica, expressed as the proportion rating each attribute as “very important” (December 2024–April 2025). Group differences were tested using Pearson’s chi-square (χ^2), with effect sizes reported as Cramér’s V. Percentages are rounded to one decimal place and subject to a $\pm 4.9\%$ margin of error (95 % CI).

Attribute	Expert fishers (n=65)	Tournament fishers (n=77)	χ^2 (df=1)	p	Cramér’s V
Ocean cleanliness	95.5 %	84.1 %	4.49	0.034	0.18
Biodiversity protection	95.1 %	81.2 %	6.16	0.013	0.21
Conservation efforts	94.7 %	86.4 %	2.97	0.085	0.14
Scenic beauty	94.0 %	77.3 %	7.09	0.008	0.22

America, where satisfaction is more often explained by catch-related outcomes such as size and harvest success (Birdsong et al., 2021; Golebie, 2017; Ihde et al., 2011). Still, heterogeneity in angler motivation is well documented: Birdsong (2023), Hunt et al. (2019) and Hunt et al. (2023) showed that preferences vary across angler segments, while Oh & Ditton (2008) and Schramm & Gerard (2004) described temporal and specialization-related shifts in motivations. Our results suggest that, relative to studies conducted in North America and other temperate fisheries, environmental valuation among anglers in Costa Rica is more pronounced.

Statistical comparisons confirmed that Expert fishers assigned significantly greater importance than Tournament fishers to ocean cleanliness, biodiversity protection, and scenic beauty. Differences in importance attributed to conservation efforts did not reach statistical significance, and these patterns suggest that angler experience mediates perceptions of sustainability, consistent with studies of specialization and demand heterogeneity in North America (Beardmore et al., 2013; Haab et al., 2009; Jalali et al., 2025). In this context, specialization refers to differences in anglers’ experience, commitment, and fishing practices, while demand heterogeneity reflects variation in preferences and values across angler segments.

Contextual influences likely reinforce these perceptions. Costa Rica’s high biodiversity, conservation-oriented tourism marketing, and regulatory framework, including mandatory catch-and-release for billfish

(AJDIP-280-2014), differentiate it from Latin American competitors. In Mexico, valuation studies of recreational fisheries focused primarily on economic aspects and changing angler profiles, with comparatively less emphasis on conservation outcomes (Almendarez Hernández, 2023; Almendarez-Hernández et al., 2020). In Argentina, recent studies of marine recreational fisheries highlight their contribution to coastal tourism and local economies, while also documenting governance gaps, heterogeneous angler profiles, and emerging management challenges (Guidi et al., 2021; Venerus & Cedrola, 2017; Zumpano et al., 2024). Brazilian baseline studies similarly document diverse motivations across coastal and competitive fisheries, without a consistent emphasis on conservation values (Freire et al., 2020). By contrast, Costa Rica benefits from stronger institutional safeguards and sustained advocacy by NGOs, which actively integrate sustainability into the sport fishing experience (FECOP, 2022; FECOP, 2023; FECOP, 2024; Fundación MarViva, 2011; Young, 2011).

The observed link between environmental valuation and intention to return has clear policy implications. Anglers with higher environmental valuation were more likely to express an intention to revisit Costa Rica, reinforcing the role of environmental quality in destination competitiveness, as reported in other tourism and fisheries contexts (Golden et al., 2019; Lew et al., 2016). Maintaining healthy populations of sailfish and marlin, already under pressure from regional declines (Díaz-Uribe et al., 2023;

Ehrhardt & Fitchett, 2006; Marrari et al., 2023; Ramírez, 2014), is therefore both an ecological necessity and an economic imperative.

Beyond the empirical findings of this study, gender inclusion deserves greater attention. Recreational fishing remains predominantly male-dominated worldwide (Banha et al., 2024; Koemle et al., 2021), yet studies on leisure and tourism increasingly recognize women as an underrepresented but growing segment. In Costa Rica, positioning sport fishing as an accessible and environmentally responsible activity for women could diversify participation and enhance economic benefits. Such efforts would align with broader sustainable tourism strategies that seek to advance not only ecological sustainability but also social equity.

Future research directions

Several research avenues emerge from this study: (1) Comparative studies across Mexico, Guatemala, and Panama could test whether the strong valuation of environmental attributes observed here reflects pre-existing angler preferences or the influence of Costa Rica's destination context, (2) longitudinal surveys should evaluate whether repeat visitors adjust their perceptions over time, (3) species-specific analyses are needed for sailfish, marlin, tarpon, and roosterfish, which combine high recreational and conservation value (Jiménez Ramón, 2023; Marrari et al., 2023) and (4) greater attention to social dimensions which build on previous Costa Rican studies that can link small-scale fisheries to community benefits (Fonseca Borrás & Solís Rivera, 2023; Palacios-Martínez & Núñez-Zamora, 2021). Extending this focus to sport fishing could help to clarify the distribution of benefits and support greater inclusion of underrepresented groups, including women, within the sector.

Conclusions

Environmental attributes (biodiversity, ocean cleanliness, and conservation) were highly valued by U.S. and Canadian anglers in Costa Rica and were strongly associated with overall

satisfaction and intention to return. While these findings contrast with North American studies, broader generalizations should be made cautiously and validated through replication in other contexts.

From a policy perspective, the results support positioning sustainability as a keystone of Costa Rica's tourism and fisheries governance. Priority actions include: (1) maintaining and enforcing mandatory catch-and-release for billfish and compliance with AJDIP-280-2014; (2) reducing bycatch in longline and purse-seine fisheries; (3) scaling up marina-level best practices for fish handling, waste management, and client education; and (4) implementing transparent, systematic monitoring of biological and perception-based indicators to ensure that conservation outcomes remained aligned with Costa Rica's international image as a green destination. These priorities are consistent with existing national regulations, best-practice guidelines for sport fishing and marina management, and prior studies highlighting the ecological and socioeconomic benefits of such measures. They also align with national assessments that underscore the need to strengthen environmental governance, monitoring, and policy coherence (Danylchuk et al., 2017; Díaz-Uribe et al., 2023; Fundación MarViva, 2011; Granek et al., 2008; Lewin et al., 2019; Echeverría Vargas & Fernández Montero, 2025).

Protecting emblematic species is both a biological necessity and a prerequisite for sustaining Costa Rica's global competitiveness in sport fishing tourism. Beyond ecological and regulatory priorities, fostering greater inclusion of women in sport fishing represents a strategic opportunity. Targeted outreach, gender-sensitive marina services, and the promotion of inclusive tournaments could broaden the appeal of the sector, strengthen its sustainability narrative, and differentiate Costa Rica within an increasingly competitive tourism market.

Author contribution statement: Robert Paul Jones conceived and designed the study. Robert Paul Jones, Gabriela Mora Camac, and



Irene Lucía Josephy Hernández analyzed the results and prepared the manuscript.

Ethics statement: The authors declare that they all agree with this publication and that they have made contributions that justify their authorship; that there is no conflict of interest of any kind; and that they have complied with all relevant ethical and legal requirements and procedures. All sources of funding are fully and clearly detailed in the acknowledgements section. The respective signed legal document is in the journal's archives.

Ver material suplementario

Supplementary Material 1. Sport Fishing Survey questionnaire applied to U.S. and Canadian anglers in Costa Rica (IPSOS/TTU, 2024–2025). Portable Document Format (PDF).

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