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The value of attributes for sport fishing in the Chilean Patagonia: Implications for the resource management

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Special interests tourism (SIT), which is referred to the tourism where trip motivation is carrying on some specific recreational activity, has been one of the most growing economic activities around the world in last years. Tourists engaged in SIT exhibit a high average length of stay, high level of expenses and a willingness to pay for conserving natural and cultural tourist resources. Recreational fishing is among the most relevant activities of SIT at an international level. Anglers are capable of travel all over the world looking for places or regions with outstanding attributes to practice this activity.

In Chile, recreational fishing activities generate annual income between US\$10 and US\$15 millions, far from the two main rival recreational fishing destinations: Argentina with annual income over US\$150 millions and New Zealand with US\$800 millions. One of the main Chilean regions to practice recreational fishing is Chilean Patagonia (43°-55° S) due to its condition of well preserved region with a great diversity of extraordinary landscapes, including plains, ice fields, mountains, glaciers, ancient forests, rivers, lakes, fiords, and canals.

According to Chilean Tourism Agency (SERNATUR), to improve earnings from Chilean recreational fishing activities is necessary to progress in the design and application of

recreational fisheries management regulations and environmental regulations. The generation and allocation of scientific knowledge to estimate the economic magnitude of this activity is also considered a critical issue. At present, there is no systematic information available that allow us to know the magnitude and economic importance of sport fishing activities in Chilean Patagonia. The recently enacted law for recreational fishing management in 2008 presents an opportunity to address some of these issues, according to a decentralized strategy that involves the participation of local government and the private sector. The formulation of a management plan for fresh water bodies under the new regime, the main instrument of the new legislation, will demand information not only on the population biology of the resource but also on the responses of anglers to different attributes and regulations. Addressing the estimation of the economic value of fishing sites and their attributes for the development of recreational fishing activities will meet some of these requirements.

The objective of this study was to estimate economic welfare measures relevant for recreational fisheries management decisions. We also aimed to a better understanding of angler's fishing site selection behavior. Data was gathered through a survey of anglers visiting the region of Aysén (44° - 49° S) during 2007 fishing season, at Balmaceda airport, which is by far the main point of entrance for tourists into the region. Main questions in the questionnaire allowed us to gathered data on fishing sites visited and their attributes (garbage, access, congestion, illegal fishery, altered scenery, catches, and big catches) on daily basis. To analyze the angler's site selection conditioned to his (her) stay in the region of Aysén, we used a two-level nested logit model based on site attributes. In the first level anglers must decide

whether to visit a river or a lake to practice recreational fishing in the region. Then, anglers must choose which river or lake to visit, among 30 rivers and 24 lakes available in Aysén (see Figure 1).

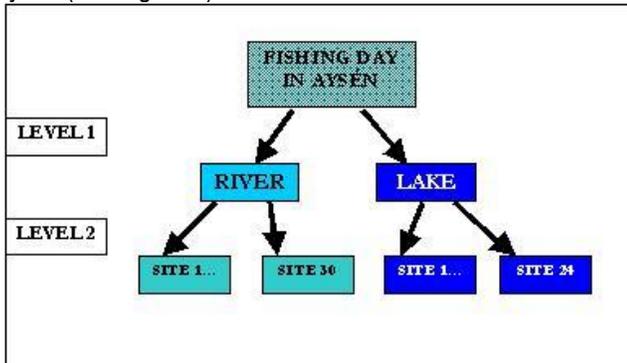


Figure 1. A two-level tree site selection decision for an angler in Aysén.

We interviewed the 40% of anglers that left the region of Aysén through Balmaceda Airport in 2007 fishing season. General information on anglers' behavior showed that anglers stayed a total of 2,411 days practicing recreational fishing in Aysén, visiting a total of 54 fishing sites: 30 rivers and 24 lakes. The average expenses for average angler's stay in this region (9 days) were near USD 4,000. A 74% of anglers were foreigners, coming mostly from USA.

The anglers' perception on the condition of fishing sites is highly positive. Considering total fishing days in the region, anglers enjoyed a 90% of days without having any perception of problematic attributes (garbage, difficult access, illegal fishery, altered scenery), and in a 76% of total fishing days they did not experience congestion in the sites.

On the other hand, econometric analysis showed that there were differences between Chilean and foreign anglers regarding angler's site selection. Analyzing the importance of the type of site visited, results showed that Chilean anglers preferred lakes, while foreign anglers preferred rivers. Considering site attributes such as catches and big size catches, results showed that Chilean anglers preferred sites with a high average of catches, while foreign anglers preferred sites with high average of big size catches.

Regarding economic welfare measures, we estimated economic values for enhanced fishing success, represented by the anglers' willingness to pay (WTP) for an extra catch and an extra big catch in sites. If we consider the total population of anglers that left this region through Balmaceda Airport, they had a total WTP of USD 504,754 for an extra big

catch, but they only had a total WTP of USD 8,186 for an extra catch for total fishing days in Aysén. Besides, the WTP for an extra catch considering fishing days in rivers was 10 times higher than the same type of WTP for fishing days in lakes, and the WTP for an extra big catch considering fishing days in rivers was 12 times higher than the same type of WTP for fishing days in lakes.

We also estimated economic welfare measures related to economic losses due to the closure of a fishing site. Considering the total fishing days in each site, these results showed that economic losses ranged between USD 265 and USD 1.4. The closure of a river generated an average loss of USD 45 when considering the fishing days stayed in each river; and the closure of a lake generated an average loss of USD 11 when considering the fishing days stayed in each lake. Hence, the closure of a river would result in an economic loss 4 times higher than the economic loss resulted from the closure of a lake in Aysén.

This economic and behavioral information should be considered in the public-private discussion about recreational fisheries management according to the new legislation, to orient the definition of preferential areas for recreational fishing and the design of management plans for these areas in the Chilean Patagonia.



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