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# Obstacles for Developing Recreational Fishing Enterprises in Sweden



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## Abstract

The Swedish government has a stated objective of developing the recreational fishing industry, not least with respect to employment opportunities in rural areas. In this paper, the possibilities for governmental policies to enhance the development are analyzed. In a survey to the industry, the companies were asked to state what obstacles they view as problematic for running their business. Four topics are analyzed based on the answers and on the Swedish debate concerning development policies. These are lack of fish, lack of large fish, exclusive access to fishing waters, and marketing.

The major results are that policies increasing the resource base should primarily be concentrated to marine fisheries and salmon stocks, and that guides and companies in urban areas are most likely to benefit from this. Exclusive access to the fish resource is a problem primarily concerning guides and companies in the northern parts of Sweden. Quality labeling has been promoted as a way forward in the debate, but regarding to the results this will only have small effects on development. Marketing will have a broad impact on the industry since the results shows that marketing is an obstacle that is general, meaning that few differences between the companies can be found.

## Keywords:

Sport fishing, angling, fishing tourism, rural development

## I. Introduction

Recreational fishing provides benefits to society in many ways – not least by generating employment opportunities in rural regions (Rudd et. al, 2008). This is the case in Sweden, and Swedish political interest in recreational fishing has to a large extent focused on the development of economic activities in rural regions (Swedish Ministry of Agriculture, 2008). Although gaining additional attention in a situation where commercial fisheries face a stock crisis, the political objective is not new (SOU 1978:75; DS 1995:47). Two governmental studies in the last decade have examined the potential to further develop the recreational fishing industry in Sweden (SEPA and SBF, 2005; SBF, 2007). Public intervention might be necessary for the industry since part of the fisherman's experience is linked to goods outside the control of the company. Fish is an obvious example, but clean water and beautiful scenery are important ingredients of the fishing experience as well. The dependency on public policies is not least apparent in waters where also other stakeholders have interests in the resource. In Sweden a major competitor for the water is hydro-power facilities, lowering the willingness to pay for fishing just by its presence (Laitila and Paulrud, 2008).

Developing recreational fisheries under conditions of increased resource pressure is not unique to Sweden (see e.g. Cheong, 2003). Despite a number of governmental studies on how best to develop fishing tourism (SEPA and SBF, 2005; SBF, 2007), the Swedish recreational fishing industry has not reaped the economic benefits that have been seen in other countries such as Norway, Iceland, Ireland or Scotland -- all of which are recognized as "fishing destinations" by the sport fishing community (SEPA and SBF, 2005). A possible reason for this is that the empirical knowledge underlying the political initiatives is sparse and few studies have actually analysed the sector.

The first more comprehensive study covering the Swedish recreational fishing sector is Paulrud and Waldo (2010). The authors estimate the size of the sector in Sweden as well as regional distribution of the existing companies, the resource bases used, what products the sector provides, etc. A number of other reports analysing the sector in specific regions using qualitative interviews indicate topics of interest in these regions, but the results are not possible to generalize to the sector as a whole (Alatalo, 2006). Also in the international literature there are only few in-depth tourism studies focusing on the particularities of fishing tourism (Borch et al, 2008), and the supply side of recreational fishing is often forgotten (Rudd et al, 2002). Exceptions in the supply literature are Toivonen (2008), who estimate the size of the Finnish industry, and Cap Gemini Ernst and Young (2003), who assess the Norwegian industry. The scope of Finland's recreational fishing industry extends to over 1,100 companies and an annual income of 18.6 million Euros, which provide a variety of services that are directly or indirectly linked to fishing: guide operators, food, accommodation and transport services. Norway supports approximately 900 companies and employees 1,200 full time equivalents based on interviews and data from (among others) Hallendstvedt and Wulff (2002). A comparison of these studies with the current paper is difficult because of alternative definitions of a "company." However, the general magnitude of our results could reasonably be checked against these figures. Other studies have analysed the supply side in a narrower sense focusing on specific fisheries or specific niches. For example, Olaussen and Skonhoft (2008) use a bio-economic model to analyse the salmon fishery in Norwegian streams, where part of the analysis focuses on the distribution of benefits between anglers and land owners (suppliers of fishing opportunities).

A number of other studies resemble ours to some degree. For example Roehl et al. (1993) show how to develop new products and conclude that with increasing competition in the recreational fishing industry the efficient development of new tourism products is likely to play a key role in maintaining viability. Borch (2004) points to the importance of applying a multidisciplinary approach in the management of marine fishing tourism and presents issues and models that are of relevance in securing sustainable management of recreational fishing tourism. Gartside (2001) presents an overview of the marine charter boat fishing sector in Australia, covering the size and composition of the sector, its rapid growth, the developing regulatory environment and the challenges and opportunities facing the sector from both the natural resource management and tourism perspectives. Zwirn et al (2005) presents guidelines for developing angling ecotourism and discusses opportunities and challenges within this sector. Normann (2008) analyse the potential for development if the tourism and commercial fishing industries join forces and work together. An informative overview of international fishing tourism is provided by Borch et al. (2008).

The supply of recreational fishing services is of course dependent of the demand side, and a necessity for developing the sector is to utilize the potential customers' willingness to pay for both fisheries and fisheries related services. The anglers' willingness to pay for fishing opportunities and services has been extensively analysed, and several studies have examined anglers' preferences in Sweden (Paulrud, 2004; SBF, 2007 for a Swedish overview; Pitcher and Hollingworth, 2002 for an international overview).

This paper contributes to the literature by analysing obstacles for the development of the Swedish recreational fishing industry. We analyse four such obstacles: The size of the fish stock, lack of large fish, exclusive access to fishing grounds, and marketing. The paper is policy oriented, and the obstacles analyzed have been put forward in a number of governmental reports regarding Swedish recreational fishing enterprises (SEPA and SBF, 2005). In marine waters the size of the stock is determined under the framework of EU's common fisheries policy (CFP), but most recreational fishing enterprises utilize the fish in fresh water lakes and rivers (Paulrud and Waldo, 2010). Many (but not all) such inland waters in Sweden are privately owned, and an open access situation as is frequently discussed in commercial marine fisheries (Gordon 1954; Schaeffer 1954) is not directly supported by the management regime. However, with a large number of owners each having no control over stock development and the catches of other fishers, a similar situation might occur. Recreational companies based on natural resources might thus deal with externalities such as short-run congestion and long-run depletion where landowners have limited legal rights reducing incentives in resource management or value added facilities (Vail and Hultkrantz, 2000).

Jonsson (2003) show that among 100 interviewed Swedish fishing tourism enterprises, increased knowledge in marketing is one of the most demanded areas for further education, and SEPA and SBF (2005) point out that a major obstacle for the development of the sector is problems finding a market outside the local community. They further stress the importance of cooperation within the local community in order to attract customers from outside the local market. Studying Finnish recreational fishing companies, Toivonen (2008) finds "help with marketing" to be important, and Sharpley and Vass (2006) show that UK farms that are diversifying towards tourism want public support to be directed towards the promotion of tourism in the area.

The severity of these obstacles for companies with different characteristic is analyzed in this paper based on a survey to Swedish recreational fishing enterprises. The paper continues in section 2 with a discussion of the survey in which data is collected and a description of the data. In section 3 the four analysed obstacles, the explanatory variables, and the empirical model specifications are presented. Section 4 contains the results from the three separate regressions, and the results are further discussed in section 5. The paper is summarized in section 6.

## **II. Data**

### *The survey*

No public registers identifying recreational fishing companies are available in Sweden. Therefore, two different sources of information were used to identify a sample containing relevant companies. The Statistics Sweden register for Swedish companies was used to elicit the first part and the other part was created by the Swedish Board of fisheries using information from several sources such as the Internet, Regional Councils, and Tourist Information Centres.

In the summer of 2007, a questionnaire was mailed to a sample of 5000 enterprises. The questionnaire was followed by two reminders. Finally, a telephone follow-up to examine non-responders was performed. At the time of the follow-up study, the response rate was 61% (3 046 companies). The follow-up study performed by phone included 700 respondents randomly drawn by strata from the non-response. The results from the follow-up are used in the estimates by using Hansen-Hurwitz non-response plan for decreasing systematic non-response errors. In total, 731 companies that belonged to the target population – recreational fishing companies – responded. The questionnaire and further discussion on the methodology is presented in Paulrud and Waldo (forthcoming).

In the empirical estimates we have excluded companies smaller than 10 000 SEK (approximately € 1000) in turnover. These are not considered as substantially contributing to the income of the owners. This leaves 596 companies for the empirical estimations. However, due to internal non response the number of observations will vary between the different regression models estimated in the empirical part of the paper. The variables mostly suffering from non response are the dependent variables where the companies were asked to state how severe they considered a number of pre-specified obstacles for their business (see section 3 below). A detailed description of the Swedish recreational fishing sector is provided in Paulrud and Waldo (forthcoming).

## **III. Empirical Models**

Section 3 contains the choice of obstacles for the analysis (3.1), the choice of explanatory variables (3.2), and the empirical model specification (3.3). Definitions and summary statistics of the variables are presented in appendices A and B.

### *Obstacles for development*

The companies were asked about how problematic they viewed 14 different possible obstacles for the development of their business. The respondent was asked to state the size of the problem on a five graded ordinal scale. The first grade was “no problem”, the second grade was “small problem”, the third grade “average problem”, the fourth grade “large problem”, and the fifth grade was “very large problem”.

The obstacles most frequently viewed as a problem (“small” to “very large” problem), was related to lack of large fish (53%), wage costs (51%), the level of the fish resource (50 %), and marketing (48 %), see table 2.

Table 2 Obstacles for development.

<b>Obstacles</b>	<b>% large/very large obstacle</b>	<b>% viewing as obstacle</b>
High labour costs	33	51
<b>Lack of large fish</b>	<b>21</b>	<b>53</b>
<b>Lack of fish</b>	<b>21</b>	<b>50</b>
<b>Marketing problems</b>	<b>17</b>	<b>48</b>
Difficulty obtaining bank loans	15	39
<b>Exclusive access</b> (lack of privately-owned fishing grounds)	<b>13</b>	<b>34</b>
Lack of staff with relevant education/experience	12	40
Fisheries policy in general	11	35
Lack of fishing grounds	11	28
Lack of infrastructure at existing fishing grounds	10	37
Communication with private owners of fishing waters	9	29
Gear restrictions	9	30
Lack of service (e.g. accommodation, shops etc.)	9	43
Catch limits	4	28
Other	10	13

Source: Paulrud and Waldo (2008; FINFO) table 7 and Paulrud and Waldo (2010) table 3.

In the paper we focus on (1) lack of fish, (2) lack of large fish and (3) exclusive access, and (4) marketing. These topics are all within the domain of fisheries policies and could thus be addressed by policy makers without interaction with general entrepreneurial policies such as labour taxes or access to risk capital. Thus, we do not analyse high labour costs and difficulties getting bank loans further despite these topics also being major obstacles.

#### *Variables explaining differences in obstacles for development*

The variables explaining differences in how severe the companies view the obstacles are primarily chosen to reflect the Swedish policy debate. The variables are presented below in three specific groups: Services provided, company characteristics, and regional conditions.

**Services provided.** The first set of independent variables describes what kind of *services* the companies provide. Many companies provide an entire set of services, and the variables aim at distinguishing differences by the products they provide.

The first variable describing type of activity here is thus if the company provided food and accommodation, and 275 companies providing this are included in the sample. A service directly related to the fishing experience is guiding (including charter). Fishing guides is a well established concept, and the dummy variable is defined as companies providing this type of services. In the sample 180 guides are included. The last type of services provided is renting out private waters. This is defined as companies leasing out their privately owned waters. 46 such companies are included in

the sample. In general, Swedish inland waters are privately owned and managed by the owner or by an association of owners. The fishing right belongs to a real estate for historical reasons, and cannot be separated from the ownership of the estate. However, rights are perfectly transferable through the real estate market (see Brady and Waldo, 2009), and it is possible to rent out the fishing right on a long term basis.

An important aspect of the produced product is of course what kind of fishery the company is involved in. A first dummy included in the model is if the companies are based on *marine* fisheries (as opposed to fresh water fisheries). Marine waters are public and managed within EU: s common fisheries policy (CFP). An exception is the Swedish east coast where the waters 300 m of the shoreline are privately owned, but where sport-fishing is free. Of course, stocks are still shared with waters outside 300 meters. Special species concerning marine and fresh water management are *Salmon and sea trout*. These species are primarily fished in fresh waters, but migrate to the sea and are thus part of the public management. A separate dummy for salmon and sea trout in fresh waters is included in the models.

**Company specific characteristics.** A number of variables representing company specific characteristics are included in the models. We include the age of the company as a variable equaling one if the company was started within the past three years. During this period Sweden experienced a peak in the business cycle, and newly started companies could thus expect a high demand for their products. Tourism in general is a rapidly growing business and in 2006 the turnover in Swedish tourism increased by over 10 percent (NUTEK 2008). A second variable is membership in a *quality organization*. Both Stenmark and Kivijärvi (2002) and SEPA and SBF (2005) stress the importance of quality labeling nature-based products. High quality fisheries are expected to generate higher prices and the quality assurance process can in this respect be viewed as an investment in the company. In this respect the quality assurance might not only describe the quality of the fishery, but also a willingness to invest in the company to establish a competitive product on the market.

We also include a size dummy being one if the company is defined as 'large', in our case larger than 1 million SEK (€ 100000). This is not a large company compared to other industries, but at least it is a company being able to generate at least one full time employment.

Recent research concerning entrepreneurship and gender tend to find similarities between men and women rather than differences, while studies before 1980 tend to find such differences (Sonfield and Lussier, 2009). We thus expect no gender differences based on general entrepreneurial differences, but note that recreational fishing is to a larger extent conducted by male. In Sweden 65 % of the recreational fishermen are male (SBF, 2007). A dummy for male manager is included in the analysis.

Diversification is a strategic objective in Swedish rural policies aiming at a competitive industry (Swedish Ministry of Agriculture, 2008). Alsos and Carter (2006) study farm diversification in Norway and find physical but not human capital to benefit the other activities. We include a dummy variable for companies being recreational fishing specialists, i.e. they have not diversified outside the fisheries sector. Common diversifications for companies not being specialists are accommodation, hunting/nature guiding, and other tourism.

**Regional conditions.** Three variables describing the regional conditions of the company are included in the models. The first is if the company is located in the northern part of Sweden. This is defined as

the NUTS2 region “övres norrland” which is a region with large areas of nature but located far from the more densely populated southern regions of Sweden. Companies in this region have been investigated by e.g. Sandström (2004) and Alatalo (2006). A dummy equaling one if the company is located in one of the regions of the three major cities in Sweden (Stockholm, Gothenburg, and Malmö) is included to capture the special conditions in these parts of the country. The three regions are all densely populated and located at marine shores. Although the population density is important, tourism might be well established in less populated regions as well.

### *Model specification and estimation*

To empirically estimate the relation between company characteristics and how severe the companies view the obstacles we use an ordered logit model. Logistic regression models are adequate to analyze the relationship between a discrete dependent variable and a set of explanatory variables (Greene, 2003). The ordered logit model is suitable for situations where the dependent variable has a natural order, and in our case it is ranked from 1 to 5 (Long, 1997). The ranking reflects an ordinal scale as discussed in section 3.1.

Our models, one for each obstacle, have the following form:

$$y_i^* = x_i\beta - \varepsilon_i \quad \text{where } y_i = \begin{cases} 1 & \text{if } y_i^* \leq \alpha_1 \\ 2 & \text{if } \alpha_1 \leq y_i^* \leq \alpha_2 \\ 3 & \text{if } \alpha_2 \leq y_i^* \leq \alpha_3 \\ 4 & \text{if } \alpha_3 \leq y_i^* \leq \alpha_4 \\ 5 & \text{if } \alpha_4 \leq y_i^* \end{cases}$$

$y_i^*$  is unobserved. Whereas  $x$  represents the vector of explanatory variables,  $\beta$  is the vector of coefficients that is being estimated together with  $\alpha_1$ ,  $\alpha_2$ ,  $\alpha_3$  and  $\alpha_4$ .

Results for the different models are presented in the next section (See table 3). The statistical significance of the variables is tested both with a t-test and with separate Likelihood Ratio tests where the tested variable is excluded from the model and the ratio of likelihoods for the full and restricted models is used for the test. The goodness of fit for the model was tested by the Hosmer and Lemeshow Goodness-of-Fit Test. This test divides subjects into deciles based on predicted probabilities, then computes a chi-square from observed and expected frequencies. That is, if the Hosmer and Lemeshow Goodness-of-Fit test statistic is .05 or less, we reject the null hypothesis that there is no difference between the observed and predicted values of the dependent; if it is greater, as we want, we fail to reject the null hypothesis that there is no difference, implying that the model's estimates fit the data at an acceptable level. Remark that this in itself does not mean that the model explains much of the variance in the dependent. To perform the test the data was dichotomized. The test was performed three times for each obstacle, by changing the dichotomization level. Meaning that in the first test all observation with a “1” got the value zero and all the others (“2-5”) got the value one. In the other two tests the level was above “2” and above “3”, respectively. The test statistics implies that the model's estimates fit the data at an acceptable level.

The models have been tested for possible sample selection bias caused by the sampling scheme using two different frames. In the register sample, the probability to be included in the sample is a function of the total number of companies in the register. In the sample based on internet etc., the probability to be included is a function of visibility. The different sampling methods might affect the

estimated results. To test if two separate regressions for the samples are preferred to a pooled, a LR test was performed where the sum of log-likelihoods for the two separate models was tested against the log likelihood of the pooled model. The test statistics show that we cannot prove any differences between the models based on sampling scheme: Lack of fish, LR = 12.71; Lack of large fish, LR = 16.41; Exclusive access, LR = 12.09; Marketing, LR = 11.65. The critical value at 5 % significance and 12 d.f. is 21.02.

Table 3. Regression results for lack of fish, lack of large fish, exclusive access and marketing (coefficients and in parenthesis standard errors)

	Lack of fish	Lack of large fish	Exclusive access	Marketing
<i>Services</i>				
Guide	0.410* (0.198)	0.623** (0.199)	0.982** (0.216)	0.133 (0.200)
Renting out water	-0.079 (0.318)	-0.151 (0.320)	0.000 (0.352)	-0.078 (0.323)
Food and accom.	0.083 (0.186)	-0.015 (0.185)	0.250 (0.205)	0.634** (0.188)
Salmon - fresh water	0.618** (0.199)	0.511* (0.198)	-0.071 (0.219)	-0.047 (0.201)
Marine fishery	0.767** (0.250)	0.538* (0.252)	-0.728* (0.290)	-0.010 (0.257)
<i>Characteristics</i>				
Large size	0.363 (0.193)	0.249 (0.193)	0.683** (0.212)	0.085 (0.195)
Newly started	0.008 (0.236)	-0.063 (0.234)	0.037 (0.255)	0.675** (0.228)
Fishing specialist	0.143 (0.200)	-0.011 (0.200)	-0.195 (0.224)	-0.266 (0.204)
Quality assurance org.	-0.026** (0.230)	-0.044** (0.233)	0.293** (0.251)	-0.219** (0.236)
Male	0.492** (0.252)	0.312** (0.245)	0.429** (0.280)	0.256** (0.245)
<i>Regional conditions</i>				
North	-0.145 (0.233)	0.018 (0.228)	0.572* (0.244)	0.057 (0.228)
Large city	0.677** (0.207)	0.667** (0.208)	0.127 (0.235)	0.175 (0.211)
<i>Cut points</i>				
Cut1	0.509	0.024	1.079	-0.174
Cut2	1.439	0.954	1.947	0.863
Cut3	2.342	2.094	2.685	2.153
Cut4	3.381	3.483	3.406	3.754
LR-test of joint sign.	62.07**	54.35**	67.44**	31.20**
Observations	488	485	448	473

Using LR-tests, \*significant at 5 % - level; \*\*significant at 1 % - level.

## IV. Results

Below, we present estimation results for each of the four obstacles *lack of fish*, *lack of large fish*, *exclusive access to fishing grounds*, and *marketing*. Each model has identical explanatory variables, and the dependent variable is the stated severity of the analyzed obstacle. The results in section 4 are discussed to give an intuitive understanding of the characteristics driving the results, and when comparable results from other studies are available these are presented as to position the results in the literature. The policy implications of the results are discussed in section 5.

### *Lack of fish and lack of large fish*

The results for lack of fish and lack of large fish are very similar and are therefore treated in the same discussion.

The results show that *fishing guides* (including charters boats) tend to view lack of fish and large fish as larger problems than other companies do. Fishing guides are heavily dependent on the resource base and have difficulties substituting to other inputs if the overall stock diminishes. E.g. a restaurant where part of the product is that customers fish their own fish or crayfish might complement with bought fish if the catches are too small. Companies providing food and accommodation do not differ from other companies in their view on the subject.

Both the variables that in some sense are describing companies using shared resources and publicly managed stocks— *salmon and marine fisheries* - are relatively large, positive and significant implying that these companies view lack of fish and large fish as larger problems than other companies do. This indicates that companies fishing on privately managed waters are either more contempt with the equal amount of fish, or they have actually better resource conditions. The result is in line with Lindelöw-Berntsson (2007) who found that the coastal companies in the county of Västerbotten in Sweden were more concerned with too high fishing pressure than their inland colleagues.

Companies selling high quality products are naturally dependent on a high probability of satisfying their customers demand for catch during their fishing experience. Companies that are part of a *quality assurance organization* have negative and significant coefficients, but they are close to zero. On the one hand the companies are expected to have higher quality fishing, but on the other hand they are more vulnerable to changes in the stock situation since they must be able to provide high quality fishing continuously.

Concerning the geographical location we note that *large city* is positive and significant in both regressions, indicating that lack of fish and large fish are viewed as larger problems in these regions. E.g. the Stockholm archipelago is famous for recreational fishing and the heavily populated area is likely to imply a high fishing pressure. Gothenburg is located at the Swedish west coast that has for a number of years faced serious problems with over fishing of the cod stocks (ICES, 2009; Cardinale and Svedäng, 2004). SBF (2008) has also pointed out the higher fishing pressure close to the larger cities in Sweden. Both the variables for north are negative and show that lack of fish is a smaller obstacle for these companies compared to companies from the rest of Sweden.

### *Exclusive access*

*Fishing guides* view lack of exclusive access as a larger problem than other companies do. Guides are highly dependent on access to different types of waters as alternatives in order to serve the customer the best fishing experience in accordance with their requests. Exclusive access also gives the possibility to control the fishing rules to create or preserve better fishing conditions. This topic is less relevant for the companies using the non-exclusive marine environment, and the variable for *marine fishery* has a reasonably large and significant negative coefficient. In the *northern* parts of Sweden exclusive access to the fish resource is viewed as a larger problem. This is primarily governmentally managed mountainous regions, and a more detailed discussion of this will be provided in section 5.

Both *larger companies* and companies that are members of a *quality assurance* organization tend to view exclusive access of the fish stock as a larger problem than other companies do. This is interesting from an industry development point of view since these categories might differ in their entrepreneurial attitudes from other companies. Having bothered getting a quality label and having grown to one of the larger companies is less likely to be a company primarily started for own employment purposes. Rather the companies might be well suited for further expansion in the future.

### *Marketing*

There are few significant differences between the companies concerning marketing. The two significant variables that also have reasonably large coefficients are *food and accommodation* (0.617) and *newly started companies* (0.658). Both these coefficients are positive indicating that these companies view marketing as a larger problem than other companies do. Newly started companies can be expected to be in an expansion phase and still trying to establish a good reputation on the market. They need for example time to build a reputation strong enough to be recommended and for customers to visit their web-page, and help with marketing might be helpful in this process. The initiation phase critical for the success of the companies and about 33 % of Swedish companies (in all sectors) starting in 2003 had left the market in 2006 (ITPS, 2008).

That food and accommodation has a positive coefficient is not surprising considering that these companies primarily provide services only indirectly connected to the fishing experience. A hotel having fishing customers might not even actively search for these, but might merely happen to be located close to an attractive fishing site. Thus, finding market channels to increase the fishing based turnover might be a larger problem for these companies than for others.

## **V. The results in a Swedish policy context**

As discussed in the introduction the Swedish government has an objective to develop the recreational fishing industry, which in turn has given rise to a number of suggested policy measures. Four measures that are frequently discussed are quality labeling, marketing, fish stock development, and access rights to the resource. These topics are discussed below, followed by a discussion about guides and providers of salmon fishing.

However, before turning to the policy measures a few observations are pointed out. The first is that none of the obstacles are very severe. Lack of fish is the most severe, and is considered to be a

problem by 53 percent of the companies, but only 21 percent view it as a large or very large obstacle. Thus about 50 percent does not view it as a problem, and about 80 percent does not view it as a large problem. This does of course not imply that all companies share this view. However, we have not found any single company characteristic that highly deviates from the average. Of course, companies having a number of characteristics each having a positive coefficient might deviate substantially from others.

### *Lack of fish and lack of large fish*

Starting the policy discussion with lack of fish and lack of large fish, it is obvious from the results that resource issues are most severe when stocks are shared. Positive coefficients are estimated for marine stocks, for salmon and for fisheries in urban regions. These fisheries are all characterized by high competition for the resource, both within recreational fisheries and from external interests such as commercial fisheries and hydropower production (this is a major topic in Swedish salmon rivers). Thus, the topic does not only cover the size of the stock, but also the distribution of fishing opportunities. This, of course, involves other policy areas such as energy production, nature conservation, etc. The competition for shared resources is of course not unknown to Swedish policy makers, but the results clearly show that this is one of the most severe problems for the industry (considered a problem by more than 50 % of the companies), and that policies should focus on marine and salmon fisheries as well as the situation in urban areas. Fisheries in northern Sweden are less concerned with the size of the resource base.

### *Exclusive access*

One way of dealing with both the size of the stock and the access to the resource is to introduce possibilities for exclusive access to the resource. Economic theory suggests that exclusive access will not only increase the economic benefits of a fishery, but also gives incentives to improve stock management. The strongest result for exclusive access is the positive coefficient for guides. Thus, access to more exclusive waters could be expected to decrease the obstacles for developing the guiding part of the recreational fishing industry to a larger extent than for other activities. This is related to the stock situation where guides view both lack of fish and lack of large fish as larger problems than other companies do. However, the relation between lack of fish, lack of large fish and exclusive access seem to vary within the country. Companies in the northern regions where fishing pressure is lower view lack of fish as a smaller problem than other companies do, but they are still significantly more concerned with lack of exclusive fishing rights. This is one of the strongest results in the exclusive access regression. The result indicates that other aspects than the fish stock being important for the exclusive access. One such is the risk for crowding at popular fishing spots that might decrease the value of the customers' fishing experiences. The opposite situation is present in many fresh water salmon fisheries. Here, the access to the fishing spot might be exclusive, but since the salmon migrates the companies still have no influence on the stock development and distribution. In line with this, the salmon companies tend to view the stock situation as a larger obstacle than others, but do not differ regarding exclusive access. From a policy aspect, exclusive access is primarily an obstacle for guides in the northern parts of the country. Fisheries in the north are to a large extent performed in lakes and streams in mountainous regions which are managed by governmental agencies (regional councils) or larger forest companies. Recreational fishing companies might get the chance to rent the fishing right in such lakes and rivers, but this has low priority for governmental agencies compared to e.g. public access to the lakes and the interests of reindeer

breeders (Zobel, 2008). Since the government has the management responsibility for these fishing waters, there already exists a policy platform for taking measures towards the access obstacle.

### *Marketing*

Marketing is the topic where most companies want governmental help (Paulrud and Waldo, 2008), and marketing policies are also put forward in Jonsson (2003) and in SEPA and SBF (2005). Marketing might be viewed as a problem that the industry should be able to solve internally, but the companies are small and larger marketing efforts might not be possible at an individual basis – at least not if trying to reach outside a more narrow group of devoted sports fishermen reading specialized magazines. Thus, common platforms for promoting nature tourism companies etc. both nationally and internationally might be valuable and beneficial for a broad set of fishing companies. Marketing and newly started companies are the only differences between the companies that have a reasonably high coefficient. Thus, marketing is an obstacle viewed as a problem by many of the companies, and where policy measures will have a broad impact on the industry. Of course, the term marketing is open for interpretation, and different marketing methods and the promotion of different aspects might affect the companies differently.

### *Quality labeling*

The quality of the products is put forward as an important aspect in both Kivijärvi and Stenmark (2002) and SEPA and SBF (2005). This is analyzed by the quality assurance organization variable in the regressions. Quality labeling the product is an active step which might indicate a long term plan to establish the company on the market. Thus, when interpreting the results it is important to be careful regarding whether it is the quality assurance per se that drives the results or whether the quality variable indicates companies that are more innovative and active in the market. The coefficient for quality organization is significant in all regressions, but the absolute values are small. Thus, being member of a quality organization has an impact, but promoting this as a policy measure faces the risk of having a blunt tool for industry development. None the less, the coefficients have the expected signs since high quality companies view lack of fish and lack of large fish as smaller obstacles, exclusive access as a larger problem (this is the expected sign since they need some kind of control of the stock situation in order to be able to provide high quality fishing over the years), and marketing as a lower problem. The latter is intuitively correct sign both since these are specialized companies with a clearly defined group of potential customers (specialized sports fishermen) that is easy to reach, and since the quality organization also is involved in marketing issues.

### *Guides*

In the regression results the guides are standing out as the companies facing the largest problems. Perhaps the most central for the guiding companies is to present catchable fish and especially large fish. To access, maintain and manage high quality fishing for guiding it is in many cases an advantage with well defined fishing rights. If not owned by the guides themselves it shall be easy to find the owner and rent the water. Well defined ownership is needed to control and sustainable maintain the resource and not the least to give incentives for managing the resource. In Sweden there is no lack of public fishing waters (SBF, 2008). Creating possibilities for the companies to rent fishing waters to get exclusive access would be one way to diminish the companies' obstacles for development. Long term rental contracts would most probably not only diminish the obstacle lack of waters with exclusive access but also by incentives for better management increase the amount and size of the fish.

## *Salmon*

The salmon fishing in the Swedish rivers has for all times been a valuable fishing resource and the access is therefore well controlled. The companies using salmon as a resource experience lack of fish and lack of large fish as obstacles rather than exclusive access. The salmon fishing is strongly affected by commercial fishing in the sea and not the least by the hydro-power industry. Naturally this case is the same as for marine companies, but here the access to the river is controlled but the problem with lack of fish and lack of large fish bottoms in the problem "Where shall the fish be caught?"; river or sea, and how can we keep fish in the system (go passing the hydro-power plants). To increase the knowledge of the external effects, commercial fishing and hydro-power production, in a CBA context on the recreational fishing business is of importance to find an optimal allocation of the use of the resource as well as finding an optimal strategy for using the water for hydro-power exploitation.

## **VI. Summary and conclusions**

In this paper four topics that are important for recreational fishing companies in Sweden are analyzed: Lack of fish, lack of large fish, exclusive access to fishing waters, and marketing. The topics are chosen as they have been important in governmental reports, and as the companies themselves have stated them as obstacles for their development. The Swedish government has a stated objective of developing the industry, not least with respect to employment opportunities in rural areas. The results of the study are related to the Swedish discussion on how to promote such development.

The major results are that policies increasing the resource base should primarily be concentrated to marine fisheries and salmon stocks, and that guides and companies in urban areas are most likely to benefit from this. Exclusive access to the fish resource is a problem primarily concerning guides and companies in the northern parts of Sweden. In the north, the government has the management control of the fishing waters and is thus already in possession of tools for enhancing the development in these rural areas. Quality labeling has been promoted as a way forward in the debate, but regarding to the results this will only have small effects on development. Thus, other policy measures might be of larger importance. One such is help with marketing. The companies are small on average and expensive marketing might not fit within the budget. Marketing will have a broad impact on the industry since few differences between the companies are found.

## **Acknowledgment**

The authors greatly acknowledge financing from Elforsk, the Swedish Energy Agency, the National Board of Fisheries and the Swedish Environmental Protection Agency in the R&D programme "Hydropower - Environmental impacts, mitigation measures and costs in regulated waters", [www.vattenkraftmiljo.nu](http://www.vattenkraftmiljo.nu). Valuable comments have been provided by Professor Thomas Laitila, Örebro University in Sweden. We would also like to greatly acknowledge the contributions by Monica Campos, SLU in Sweden.

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## Appendix A: Variable definitions

Variable name	Definition
<b>Obstacles</b>	1 = “no problem”; 2 = “small problem”; 3 = “average problem”; 4 = “large problem”; 5 = “very large problem”
Lack of fish	Stated severity of the problem ‘lack of fish’
Lack of large fish	Stated severity of the problem ‘lack of large fish’
Lack of exclusive access	Stated severity of the problem ‘lack of exclusive access’.
Marketing	Stated severity of the problem ‘marketing’
<b>Services provided</b>	
Guide	Equals 1 for providing guiding/charter services, 0 otherwise.
Renting out private water	Equals 1 for renting out private waters, 0 otherwise.
Food and accommodation	Equal s 1 for companies providing food and accommodation, 0 otherwise.
Salmon - fresh water	Equal s 1 for utilizing salmon and sea trout in inland waters, 0 otherwise.
Marine fishery	Equal s 1 for utilizing fish in marine waters, 0 otherwise.
<b>Company characteristics</b>	
Large size	Equal s 1 for companies having a total turn-over, not only from recreational fishing services, larger than 1 mSEK (about € 100 000), 0 otherwise.
Newly started	Equal s 1 for companies started during 2004- 2006, 0 otherwise.
Specialist	Equal s 1 for companies that do not provide goods or services outside the recreational fisheries sector, 0 otherwise.
Quality assurance org.	Equal s 1 for having a membership in a quality assurance org., 0 otherwise.
Male	Equal s 1 where the person responsible for the company is male, 0 otherwise.
<b>Regional conditions</b>	
North	Equals 1 for companies located in NUTS2 region SE08, 0 otherwise.
Large city	Equals 1 for location in the county of Stockholm, Gothenburg or Malmoe, 0 otherwise.

## Appendix B: Summary statistics

	Mean	Std. Dev.	Min	Max
<i>Services</i>				
Guide	0.30	0.46	0	1
Renting out water	0.08	0.27	0	1
Food and accom.	0.46	0.50	0	1
Salmon - fresh water	0.23	0.42	0	1
Marine fishery	0.14	0.34	0	1
<i>Company characteristics</i>				
Large size	0.29	0.45	0	1
Newly started	0.15	0.36	0	1
Fishing specialist	0.33	0.47	0	1
Quality assurance org.	0.17	0.37	0	1
Male	0.85	0.35	0	1
<i>Regional conditions</i>				
North	0.18	0.38	0	1
Large city	0.23	0.42	0	1