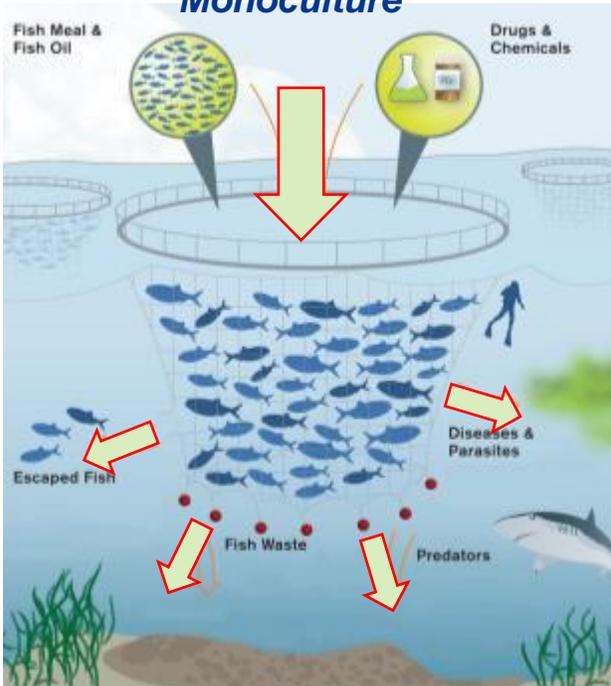


Aquaculture alleviates the pressure on wild fish stocks by producing a large share of global fish demand. However, it also puts pressure on the aquatic environment (left picture). Recently, *Integrated Multi-Trophic Aquaculture* (IMTA) is emerging in Europe as a less environmentally damaging alternative to traditional monoculture (right picture).

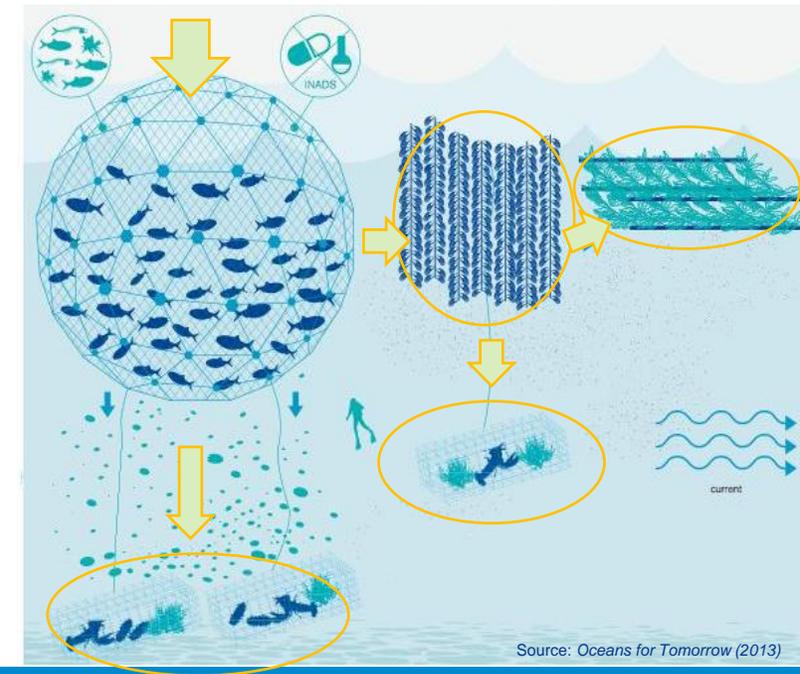
### Monoculture



In Integrated Multi-Trophic Aquaculture several species are combined in the production process. It can be seen as a simplified artificial ecosystem. Species are selected by their function in the ecosystem and their economic value. They are combined with other species in such a way that plants and animals absorb each others output in the production process, thereby reducing costs and decreasing the environmental impact of the products. Additionally, IMTA diversifies the economic risks of fish farmers and may lead to higher profits as consumers are willing to pay a higher price for aquaculture products with lower environmental impacts.

This study aims at identifying the value that consumers of aquaculture products (Salmon) attribute to a decrease in environmental pressure. The study assesses consumer willingness to pay for several levels of sustainability. These levels of sustainability are reflected in an ecolabel for aquaculture products.

### Integrated Multi-Trophic Aquaculture



Source: Oceans for Tomorrow (2013)

## Growing Fish in Troubled Waters?

### Determining Consumers' Preferences for Sustainable Aquaculture

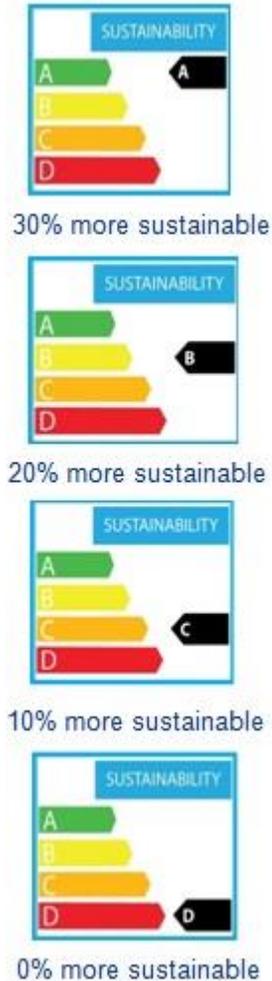
# Growing Fish in Troubled Waters?

## Determining Consumers' Preferences for Sustainable Aquaculture

### Ecolabel

An eco-label identifies products that are preferable to other products in the same category on environmental grounds. Eco-labeling is commonly used as a tool to link additional payment for a product to an increase in the sustainability of its production. In the seafood industry, both industry and non-industry groups proposed eco-labeling as a means to prevent overexploitation of natural seafood stocks

The ecolabel created for this purpose is the *Pressure on Environment Rating Label* (PERL). It reflects the degree of environmental pressure. In the experiment, each rating reflects a decrease in environmental pressure of 10%. The label is based on EU energy rating schemes, so that consumers recognize the label.



### Methodology

A choice experiment has been conducted among the residents of Oban. In this choice experiment respondents were asked to indicate which salmon they would buy out of a selection of salmons. These products varied on levels of sustainability, origin and price. A choice card consists of a choice between two products and an opt-out. An example of such a choice card is shown on the right.

The choice experiment was conducted by spreading a survey with choice cards and instructions among the residents of Oban and picking them up the following day. A total of 201 surveys were returned. The respondents' willingness to pay for sustainability is estimated through the use of a multinomial logit model (MNL), which is commonly used in choice modeling

### Choice Card Example

choice 1



choice 2



choice 3

I would not buy any of these salmons, even if it was on my shopping list

# Growing Fish in Troubled Waters?

## Determining Consumers' Preferences for Sustainable Aquaculture

The choice experiment showed that consumers value sustainability in aquaculture production. The relationship between sustainability and willingness to pay is found to be linear with a WTP of £0.13 per percent of decreased environmental pressure.

### Conclusions on Consumer Attitudes

Consumers are aware of overfishing and a majority considers it a problem.

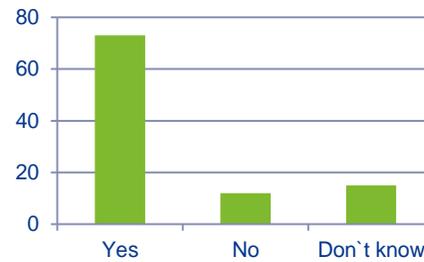
- 73% considers overfishing a problem
- 12% believes that overfishing is no problem
- 15% indicated that they don't know

There is a slight awareness among consumers of the environmental effect of aquaculture. A majority of the respondents (77%) is familiar with at least one way in which fish farms affect the environment.

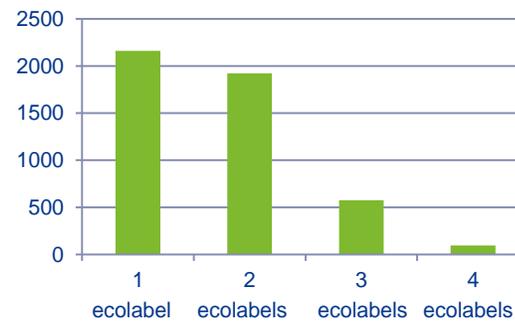
### Conclusions on Ecolabel Familiarity

Consumers are familiar with ecolabels (55%), but a share of respondents is not familiar with ecolabels and a large share (45%) does not use it regularly.

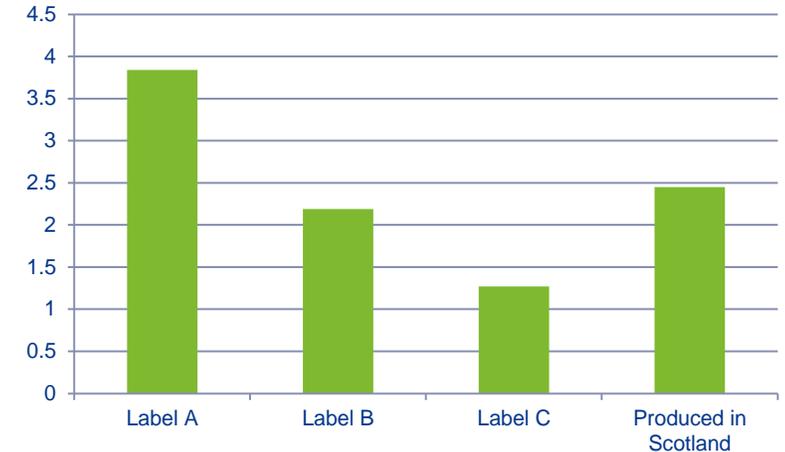
- 45% knows no ecolabels,
- 40% knows one ecolabel
- 12% knows two ecolabels
- 2% knows three ecolabels
- 1% knows four ecolabels



Respondents' Answers to "do you consider overfishing a problem?" (in %)



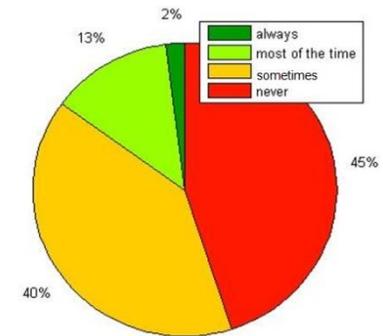
Respondents familiarity with marine ecolabels (in number of respondents)



Respondents' WTP for Sustainability (in £ per pound of salmon)

### Recommendations

A large share of consumers uses ecolabels to some degree when making purchasing decisions, so an ecolabel has potential to influence consumers purchasing decisions. However, due to the lack of consumers familiarity with multiple ecolabels, adding another ecolabel to the market may not be effective. For this reason, proliferation of the label and clear communication to the consumer are required.



Respondents' use of ecolabels when buying salmon