Deliverable 2.6.1 Report on FISHEX 1: A Prototype Simulation for Stakeholder Management in Fisheries

JAKFISH
Judgement And Knowledge in Fisheries Involving StakeHolders

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Report on FISHEX 1: A Prototype Simulation for Stakeholder Management in Fisheries

Deliverable 2.6.1 JAKFISH
(Judgement and Knowledge in Fisheries Involving Stakeholders)

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Abstract

This paper reports on the research carried out by the authors over two consecutive EU funded projects and constitutes the deliverable 2.6 for the JAKFISH project. FISH EX1 is a role play simulation which looks at how competing stakeholders develop risk perceptions in fishery management and considers how they could be encouraged to negotiate with each other. The aim of the simulation is to consider how different stakeholder mental models can be reconciled by achieving common understandings about the risks to fish stocks through the use of a role play simulation exercise.

The simulation uses a role play methodology to enable players to interact and negotiate their demands. The aim is not to recreate reality itself, rather, to bring about psychological fidelity (Gredler, 1992, Borodzicz, 2005) and enable players to take on the role of stakeholders and simulate the negotiation process. The simulation experience also helps players to perceive and understand the world from a different viewpoint to their own. The exercise takes the form of a role play simulation lasting about 1-2 hours, the exercise is designed to be used with actual stakeholders, although not playing their own roles, hence, players do not need to be experienced in the roles they perform.

1. Introduction

This paper reports on the research carried out by the authors over two consecutive EU funded projects and constitutes the deliverable 2.6 for the JAKFISH project. FISH EX1 is a role play simulation which looks at how competing stakeholders develop risk perceptions in fishery management and considers how they could be encouraged to negotiate with each other. The aim of the simulation is to consider how different stakeholder mental models can be reconciled by achieving common understandings about the risks to fish stocks through the use of a role play simulation exercise.

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exercise takes the form of a role play simulation lasting about 1-2 hours, the exercise is designed to be used with actual stakeholders, although not playing their own roles, hence, players do not need to be experienced in the roles they perform.

2. Context and Background to Simulation

The debate regarding fish stocks has intensified in recent years, as differing perception of stock and sustainable yield between fishermen, scientists and regulators continues. European fisheries management is widely considered to have failed in meeting the objectives of the Common Fisheries Policy (Shepherd, 2003). However, the output of fish products in the EU continues to grow. In 2005, production was around 7 million tonnes, making the EU the second largest fishing power behind China, with one of the largest markets for fish products in the world.

The demands of a growing population have lead to the overexploitation of many fisheries around the world. It is estimated by the FAO (2007) that over 75% of wild fisheries are considered overfished, fished to capacity or recovering. Governments’ worldwide, and particularly in the EU, have implemented policies to ameliorate the overfishing problem. The “fisheries problem” originated from the little or no management of fisheries. Vessels were not limited to what species they could target and how much they could land. Therefore, because fishing is essentially an economic activity, and hence is largely driven by economic incentives, the propensity for fishermen to overexploit the resource is can be viewed largely as a lack of property rights over the fishery resource (Pascoe, 1998).

In response to these concerns, the European Commission have funded several projects to determine best practice of involving stakeholders in the management process. The EU PRONE project attempted to define risks in the fishing industry and utilised the mental modelling process to develop an understanding of risk in the fishing industry from a variety of stakeholders. This prototype simulation developed in the subsequent JAKFISH project, aims to create a role play environment where players are able to reflect on their decisions within a participatory framework, it also aims to expose different interpretations of risks and to encourage a process of risk communication among the players (stakeholders) and an exchange of mental models in order to resolve disagreements. The simulation does not attempt to accurately assess the effect of decisions on fish stocks (the science for this is still largely speculative and contested), but it will attempt to accurately reflect actual risk perceptions by stakeholders as found in the PRONE project using a mental modelling methodology. The exercise also attempts to deal with issues of multiple stakeholder resource management. The JAKFISH project conducted two previous case studies within this work package one based on forestry (Borodzicz and Drakeford, 2009) and the other based on common pool resource management (Dreyer and Renn, 2009), in both of these case studies

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there was found to be a need to resolve or at least minimise friction between the needs of different competing stakeholders.

3. Stakeholders and Worldviews

Stakeholder worldviews were established as part of the mental modelling exercise carried out for the PRONE project. In the case of the sea fishing there are also stakeholders with competing demands and different world views. Briefly each of these key stakeholder worldviews are reviewed below.

For example, fisherman would wish to maximise their potential income by harvesting the largest catches possible; on the one hand this is supported by a pragmatic need to make their activities economically viable, on the other this is supported by a belief that the science of fish stock estimates by scientists and other anti-fishing environmental lobby groups are liable to be extremely risk averse in nature, inaccurate and sometimes misleading. Prices for fish landed are also the subject of both domestic and international markets, and so are likely to be key drivers of fisherman worldview. There is also a long tradition often reinforced through tight knit communities, of perceiving their activities as harvesting produce from the sea in a sustainable way.

Another example could be scientists who while passionate about their attempts to accurately predict the level of stocks, often produce conflicting results. This reflects the complex nature of the task of fish stock modelling, where harvesting is not the only factor affecting the abundance. It is difficult to measure the abundance of creatures that can so easily move around from one area to another, often reacting to a variety of factors such as small changes in sea temperature, changes to regulation of harvesting methods and quotas. Issues with the understanding of how stocks reproduce, and viable numbers for this to take place in order to avoid stock collapse, are further features likely to affect estimates by scientists about viability and sustainability of fisheries.

Consumers as stakeholders play a key role both individually and through the buying power of major retail chains to drive both the demand and price of fish. In the Prone project consumers were divided into two categories ‘fishing aware’ and not ‘fishing aware’, reflecting some of the small sample sizes in countries like the Faroes and Iceland where many consumers are likely to be related to members of the fishing community (Tingley et, al. 2010) For the UK in contrast, where fishing represents a tiny proportion of the economy, most consumers are unlikely to have a profound knowledge about how fish have been caught and the sustainability of methods used and viability of species. Another aspect of the consumer community is the large amount of fish that is either exported or imported. Initiatives to label fish and provide consumers with information have had partial success, but this still represents the minority of fish products sold. For the purposes of this simulation, the consumers were simplified to the role of the large supermarkets

Regulators are another interesting category of stakeholders whose task it is to control the fishing industry through a variety of key levers. Typically this could be by limiting the days
at sea (DAS), or by controlling the total allowable catch (TAC). They could also specify that fish should be a certain size or restrict catches to particularly seasons. Another way they might control fisheries is by zones and they could in extreme circumstances even close fishing zones completely in order to allow stocks to recover. Regulators also have a political role to play, hence while heavily influenced by scientific research on fish stocks and species viability, they must also consider the importance of fishing to the economy of an area not just in terms of fishermen themselves but also to fish processing industry that it might support.

Another stakeholder grouping are environmental lobbyists who range from hard line groups who may want all fishing to stop to those who wish to see a more sustainable approach adopted by the fishing industry.

On further and very important stakeholder group is the media. They are free to walk around and interview players throughout the exercise, they are also encouraged to write headlines based on their discussions with the players and observations of the exercise and injects.

4. Method

The game is administered throughout by the facilitator who organises the pre-brief administers the game and distribution of injects and conducts the de-brief. The game is conducted in the following order:

4.1 Pre-brief - Players are initially given a pre-brief to the exercise by the facilitators. The introduction consists of a ten-minute presentation about the background to the exercise, its aims and objectives and the expectations of the players. It is used to familiarize the players with the principle processes and competing demands required in the harvesting supply and demand for sea fish.

4.2 Identities - Following the pre-brief players are each given a stakeholder identity (sample shown in appendix A). They are given about 5 minutes to read their identity and encouraged to try to imagine themselves as that person. The identities are important for the players in order to create a realistic context within which to consider the subsequent injects.

4.3 Rules – The players are then introduced to the rules for the game, there are in fact very few rules, other than those imposed by the players themselves. They are free to talk to other players as long as the other player is not already engaged in a conversation. Later on in the game this rule is relaxed and a group discussion is encouraged.

4.4 Injects – The game begins with the handing out of the first injects to each player (see sample injects in Appendix B). The simulation pace is set by the speed at which injects are handed to the players. Depending on how the facilitator gauges the capability of the players to handle injects, the speed of distribution can be increased or decreased. What is important, however, is not the amount of injects that the players can handle, rather, the extent to which they are able to use these in order to facilitate useful discussions with the other players.
4.5 Stakeholder Negotiation Meeting – This is an important milestone in the exercise representing one year in real time. After about 45-55 minutes stakeholders are advised that there will be an opportunity to put a case to the regulator for desired changes to policy, this to some extent can be seen to be similar to a RAC. Some stakeholders may have negotiated with each other to work together in order to influence the regulator. Each player is then given an opportunity to each make a 2 minute pitch to the regulator in order to ask for desired changes and justify why these are required. For example, Fisherman may argue that quotas for catch levels need to be maintained or even increased to protect jobs and communities, while environmental groups may argue for reduced quotas to protect sensitive species. At the end of this session the regulator is given 5 minutes to decide any changes to policy that he/she deems appropriate and is the required to make an announcement to the whole group of players.

4.6 Election – At the end of the stakeholder negotiation meeting all players are given a free vote of confidence in the regulator (see appendix c ballot papers). If the regulator is successful they keep their role, otherwise one of the players is will change roles with regulator and the game then goes on to a second annual cycle where the process of stakeholder negotiation meeting and election takes place.

4.7 Debrief – The debrief is an important part of the simulation as it is an opportunity for players to reflect on what has happened and how what may have been hardened and competitive positions have been negotiated to one of common understanding. The value of this to players who are playing a role alien to their position in real life offers an opportunity for the

4.8 Equipment

The simulation is designed to be light and portable for ease of use the materials are those typically found in a desktop exercise. The exercise is driven by a series of paper injects designed to create a psychological context in which stakeholders can debate. Hence materials consist of a table with chairs arranged in a room, ideally with some space for players to move around and hold discussions with each other. Paper based documents include a basic scenario, role-play characters, injects and response forms were prepared for players (see appendices). A video camera was used in order to facilitate analysis of the simulation by the authors but could also be used for debriefing. It is also useful if there is a Flip chart/white board/ or computer with projector for use to display live media inputs to the players throughout the exercise. It is also useful to have some sticky labels to use as badges so players can easily identify each others roles in the simulation.

5. Results and Discussion
The simulation has to date been run twice with two different cohorts of people and a video machine with sound was used to record the exercise and review progress. Some modifications were made after the first simulation which used members of the JAKFISH project itself as players. Identities were improved and the pre-brief was also made clearer. The exercise was subsequently taken to the 2010 International Simulation and Gaming Conference in Education and Training (ISAGA) in Spokane and run with a group of delegates as players and found to run very well and produce interesting debates between players during the game and during the debrief. The exercise received some good reviews from the delegates.

The exercise appears to fulfil its aims as a prototype but will continue to develop with further use, in injects can be easily changed to suit changing issues in specific fishery management concerns and debates. In terms of the primary purpose, engaging competing stakeholders to communicate with each other, the simulation appears to have potential as a prototype to increase dialogue between scientists, regulators, fishing communities.

A potential next step to the exercise would be to use mental modelling process to consider how players view risk before and after playing in the simulation. It would be of value to understand how risk perception is constructed for players, and whether this can be changed by playing roles which are less familiar and even antagonistic to those in real life.

The simulation has also been identified as a useful teaching tool for students interested in fishery management and economics. With some further adaptation it could be used to facilitate understanding and bring about improved risk communication in other potential areas of common resource management, such as forestry, national parks, waterways and even urban scenarios.
6. Bibliography


Dreyer, M., Renn, O., Borodzicz, E. and Drakeford, B. 2009 Review of Literature about participatory modelling resources governance: Findings from Forestry management (part 1) and water resources/ river basin management (part 2). Deliverable 2.4 in Judgement and Knowledge in Fishers Involving Stakeholders (JAKFISH) Contract 212969.


7. Appendix A: Identities

Fishermen

You are an experienced fisherman who has been fishing the Spokane Fishery for the last 31 years. Both your father and grandfather, who fished the Spokane Fishery for the last 50 years, passed down the vessel to you. You left school at the age of 15 to work as a deck hand when the vessel was skippered by your father. You were 30 years old when you took control of the vessel making you one of the younger skippers in the fleet. However, 10 years ago you bought a new boat, “the fruitful harvest” at a cost of $3 million in response to increased demand for fish in markets. Like many other boats in the fleet, your new boat is technically capable of catching fish in the severest of conditions and is capable of landing 25 tonnes per trip. Now 46 years of age, you have been a skipper for 16 years, and you have an experienced crew of 5 men. These men have formed your crew for the last 8 years and you have a very good working relationship with them.

However, the promise of good fishing has not followed since the purchase of your new boat. Reductions in allowable catches, and a general decrease in the market price of fish, have reduced the boats profitability in recent years. While you have remained loyal to your crew, and vice versa, any further restriction in catching capacity in future years is likely to be detrimental to both you and your crew. The situation has been made worse in the current economic climate and without changes in fisheries management to allow for higher catches your future in the fishing industry may be limited.

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Scientist

You are a 52 year old experienced scientist with 20 years experience in the field of fisheries science. Since graduating from the University of California with a Master Degree in Fisheries Science in 1993, you have worked at several research institutes in universities. Your particular area of expertise is stock assessment. You have several years of experience working closely with fishermen. You, therefore, understand their needs and aspirations for the resource and understand why they sometimes feel aggrieved by the fisheries science process.

After a period of working for a large consultancy firm, you have returned to the University of California and work as a senior fisheries scientist. In your role as senior fisheries scientist, you head up a group of 6 scientists, all of who have at least 5 years experience in stock assessment. Your main responsibility is to advise government regulators, however you have no obligation to consider the fishing industry when making stock assessment decisions. Your main responsibility is to advise government on the biological status of stocks for the main commercial species and subsequently the safe amount of fish that can be caught by fishermen each year.
As a scientist you have had a successful career but recently the situation with stocks has made you feel more uncomfortable vis a vis the sustainability of current regulation and practice. You have published some controversial papers suggesting that fish stocks are now beyond redemption at least for the next 2 decades.

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Consumer

You are 45 years old supermarket manager and one of your main duties is purchasing fish. While some of your customers prefer wild caught fish over farmed fish, they willingly purchase either providing they are aware that they have been caught or produced in a sustainable manner. Other consumers, however, purchase fish simply on a cost basis.

As a result of the intensified debate in the media in recent years, your supermarket has tried to move away from traditional commercially caught fish, such as tuna, and farmed species such as salmon, to ones that you consider good substitutes that are sourced from sustainable fisheries.

Your consumers tell you that money has been tight recently because of the recession; they like to put fish on the table because it is a healthy food source but they also have to be careful of expenditure. As a result they are becoming less inclined to pay higher prices for alternatives to popular species, such as salmon.

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Government Regulator

You are 37 years old and you have been working as a government regulator for the last 10 years. In your role as a government regulator you main responsibility is devising legislation and regulations in order to manage fisheries. In order to do so, you rely heavily on stock assessment data produced by fisheries scientists at government agencies, such as the National Oceanic and Atmospheric Administration (NOAA).

You find your role has become increasingly difficult in recent years as you have several stakeholder groups lobbying for the way in which fisheries should be managed in the future. You have fish scientists telling you that stocks for some species are declining and this should be reflected in fisheries management. They are also telling you that the abundance of some species is increasing, but any increase in allowable catches should be made with caution. You have fishermen telling you that they cannot survive on the small amount of fish that they are allowed to catch and that the abundance of the main commercial species is actually
increasing. You have conservationists suggesting that stocks need to be better managed to curtail the effects of overfishing and that some fishing techniques should be banned from the industry and some fisheries closed.

National policy continues to support stakeholder inclusion in management planning and you must therefore take into account stakeholder views when setting quota. You must, therefore, take into consideration the social, environmental and economic elements of the fishery when making management decisions, as these decisions impact on a wide range of stakeholders.

**NGOs**

You are 35 years old and you have worked with the Fish and Wildlife Service for 5 years. After studying Environmental Science at Idaho University, you subsequently worked with the WWF for 10 years. At the WWF, you worked in the fisheries section and your main responsibility was to develop management plans for priority species and you were active in consultations concerning the cod recovery plan in the North Sea.

After working with the WWF in Europe for 10 years you returned home and joined the Fish and Wildlife Service where you head up a team of 3, all of who have experience of working in the fisheries sector. In your role as a nature conservationist, you are mainly concerned with the conservation of fish stocks and are concerned that the science behind fisheries management plans, and in particular those determining how many fish can be caught from the ocean, is inaccurate. You are also concerned that government regulators seem to favour the fishing industry rather than the environment and this only contributes to the continued overexploitation of stocks. You think that the social and economic elements (such as employment and profits) of the fishery feature to heavily in determining the number of fish that can be caught each year, with the biological element of the fishery largely ignored.

Personally you do not eat fish or any other living products this is a personal choice based on your values about the sanctity of life of all creatures. You see your role as an NGO to try and influence the behaviour of others to act more responsibly to the environment.
Since the recent economic downturn your profitability has decreased. Your accountant has advised that while your current earnings are sufficient to cover loans you currently have for your boat and equipment, when interest rates increase current levels of profitability will not be sufficient. This year has been a very tough year for you. And last year, after fuel prices went up like a rocket before easing off, this year brought more draconian regulations and a very challenging trading environment as a result of the global recession that has hit your key markets.

In the last 6 months or so, you have seen costs of fishing increase rapidly. Although current loan repayments are manageable, due to record low interest rates, other costs have been increasing. Most notably, the cost of fuel has increased to record levels. You are currently paying over $1,000 a day for fuel, around double what you were paying this time last year. Further increases in fuel, or other costs of fishing, will make it very difficult to break even, given current allowable catches for the year. The outlook for next year is bleak with costs set to remain high and prices low, with little indication of government assistance.

Although your boat is capable of catching 25 tonnes of whitefish per trip, government regulations do not allow this amount of fish to be caught in one trip, as they limit the amount of time that you can spend at sea. Since your income is related to catching capacity any further decreases in the amount of fish that you can catch may mean you cannot afford to retain your full crew. Conservationists are lobbying government towards more environmentally friendly fishing techniques and government seem to favour this approach. You are concerned that if you are forced to use new unfamiliar fishing gear (e.g. different types of net) the amount of fish that you catch may decrease further. Given current conditions, this would have disastrous consequences on your profitability.

The current system of fisheries management in the Spokane Fishery has decreased the profitability of fishing to levels where it is very difficult to actually make a profit to cover all costs. Days at sea restrictions mean that you cannot even land the fish that you are allowed to catch by government regulations because you are not allowed enough time to do so.
The discarding of fish is still happening on a huge scale. Legislation has not solved the discarding problem in the Spokane Fishery. For example, NOAA tells us that last year nearly 45,000 tons of fish were dumped back into the sea dead across fisheries of the West Coast of America. If fishermen had been able to land that amount of fish rather than throw it away, it would have been worth around $120 million assuming the same market prices. However, conservationists are lobbying regulators to ensure that these discards should be landed as part of existing quotas, not in addition to. Therefore, given the recent low allowable catches and low market prices, being forced to keep discards as part of allowed catch is likely to be detrimental to profitability.

Several papers have been published in recent years detailing the rapid decline of some fish species. A paper published by leading fisheries scientists actually suggests that all species of fish will have disappeared by 2050 if current management practices and fishing activities are allowed to continue. However, fishermen are lobbying regulators for increased catches and in turn regulators are asking scientists to substantiate fishermen’s claims that more fish can be taken from the sea sustainably.

The world's fisheries are on track to collapse by 2050, warns a Canadian-led research team calling for a revolution in the way the oceans are managed. The world's fisheries are on track to collapse by 2050, warns a Canadian-led research team calling for a revolution in the way the oceans are managed.

The researchers, whose assessment of the dying seas is published in the journal Science today, say it's not too late to save the fisheries that feed millions of people. But major changes are required, and soon.

"It's bad but we know we can turn this around," says Boris Worm, head of the international team and a fisheries biologist at Dalhousie University in Halifax.

Twenty-nine per cent of fish and seafood species, including Canada's once immense Atlantic cod fishery, have collapsed to less than 10 per cent of their original size, the researchers say. They warn all other fish and seafood species could suffer the same fate, as erosion of the planet's marine ecosystem appears to be accelerating.

"This trend is of serious concern because it projects the global collapse of all taxa (species) currently fished by the mid-21st century," they say.
Consumers have become more demanding in recent years that the fish they eat is sourced from sustainable fisheries. However, the reported decline in Spokane fish stocks does not seem to translate into fewer fish for sale on supermarket shelves. In recent years supermarkets have marketed fish such as pollock and tilapia as an alternative to tuna and salmon, but as demand increases price rises are seen, pushing consumers back to traditional species. A recent press release suggests that fish advertised as alternatives to popular species, such as pollock for salmon, may face the same fate (i.e. overexploitation). Conservationists voice concern that scientists are allowing fishermen to move from one unsustainable fishery to another rather than doing the right thing and closing some fisheries to ensure long term sustainability. However, fishermen are pressurising regulators and scientists to enable them to catch more fish as abundance is increasing and their fishing activity is sustainable.

**Scientist Inject Number**

Several reports have recently been released that document the recovery of species caught in the Spokane Fishery. New data published by NOAA suggests that adult fish in the Spokane Fishery are expected to rise by 42% this year, representing the largest increase in almost 30 years. Fishermen’s efforts have been hailed as significant in contributing to this recovery, as they have abided by the many rules and regulations imposed on them in recent years. As a result, they are lobbying regulators for a reward in terms of the amount of fish that they can catch.

**Scientist Inject Number**

There has been growing speculation among fishermen that the scientific survey methods used to predict stock abundance in the Spokane Fishery are outdated and inadequate. Fishermen have suggested that the science lags so far behind reality that the amount of fish they are allowed to catch does not reflect potential catching opportunities in the fishery. After a decade of low allowable catches, last year saw the first rise in the amount of fish that fishermen were allowed to catch, although fishermen argue that the stock has been growing for the last several years. Conservationists are now lobbying regulators to reduce catches as they fear pressure from fishermen has lead to increased catches that are not sustainable.

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**Consumer Inject Number**

In the current economic climate, the cost of the weekly food bill is one of the biggest concerns for consumers. Your consumers tell you they eat fish because they like to put fish
on the table but fish is now relatively expensive compared to other foods. Farmed fish represent a cheaper alternative to wild fish with frozen processed fish representing the best value for money (in terms of cost). As some consumers have shown a preference for farmed fish, on a cost basis, media interest in farmed fish has intensified. However, recent news articles suggest that farmed fish is a poor substitute for wild fish and that consumers should purchase wild fish where possible.

**Scare over farmed salmon safety**

*Salmon farmed in Scotland is among the most tainted with cancer-causing chemicals, US scientists have warned.*

The Indiana University experts urged people to limit the amount of farmed salmon they eat after studying contamination levels across the world.

In the journal Science, they advise no more than two ounces of Scottish farmed salmon should be eaten every month.

The American researchers claim that their work is the most comprehensive analysis to date of salmon toxin concentrations, looking at more than two metric tonnes of fish bought in shops in North America, South America and Europe.

Studies have suggested that the high level of essential fatty acids found in salmon makes them a healthy addition to the diet - and the latest research is likely to alarm consumers who eat it regularly as a result. The US team examined the levels of 14 toxins, all rated as likely to cause cancer in humans by US authorities, including dioxins and PCBs, with farm raised salmon faring much worse than wild salmon.

**Consumer Inject Number**

Celebrity cooks continue to portray fish as a healthy source of protein and something which we should eat on a regular basis. Eating fish on a regular basis is thought to have a variety of benefits, such as reducing the risk of cancer and even making our children more intelligent. Sustainably caught fish, however, are a luxury that your consumers tell you they cannot afford. A line caught salmon is much more expensive than one caught by more damaging forms of fishing. Your consumers are concerned about the environment and the damage that certain types of fishing can cause but are reluctant to pay extra for fish in the current recession. People appear to be switching to cheaper foods. You need to source cheaper fish because that is what consumers are telling you they want.
In the current economic climate the demand for cheaper fish has increased. Some reports suggest that fishermen are landing and selling fish illegally to meet this demand. A recent news article suggests that illegal fishing, which is a global problem, has serious impacts on fish stocks, not least because too many fish are already being caught legally. You have noticed that the consumption patterns of your consumers changed as price increased. In light of these news articles you are worried that consumers will be even more unsure about eating fish. You are also concerned that the sale of illegal fish (for low prices) will impact on your own sales and you are likely to lose consumers.

Global measures to regulate the fishing industry lack the capability to tackle illegal catches, warn researchers.

Writing in the journal Science, they say that up to 26m tonnes of fish, worth an estimated $23bn, are landed illegally each year.

They add that a global monitoring and information sharing network is needed to crack down on illegal operators.

Eighty percent of the world's fish stocks are deemed to be fully or overexploited.

"Illegal, unreported and unregulated (IUU) fishing is a global problem and it needs a global answer," said co-author Kristin von Kistowski, a senior adviser to the Pew Environment Group, a US-based think tank.

"By creating this first comprehensive overview of port state performance, we have identified the weaknesses and problem in the system."

As a wholesale consumer (purchaser) of fish you are very concerned about a recently published article that suggests the damage caused by fishing, and the subsequent eating of fish, in some cases will be irreversible. Indeed, if current practices are allowed to continue fish will disappear in a few decades.
2050 the year of no more fish, scientists warn

The world's fisheries are on track to collapse by 2050, warns a Canadian-led research team calling for a revolution in the way the oceans are managed.

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Twenty-nine per cent of fish and seafood species, including Canada's once immense Atlantic cod fishery, have collapsed to less than 10 per cent of their original size, the researchers say. They warn all other fish and seafood species could suffer the same fate, as erosion of the planet's marine ecosystem appears to be accelerating.

"This trend is of serious concern because it projects the global collapse of all taxa (species) currently fished by the mid-21st century," they say.

Regulator Inject Number    Time

There is growing unrest in the fishing industry during the current economic climate. Government has recently refused to provide a fuel subsidy to fishermen even though the price of fuel has hit record high levels. Fishermen protest that not only are allowable catches small, making it difficult for them to stay afloat, but legislation and restrictions prevent them from catching the fish they are allowed to. Fisheries managers are being criticised for not managing the social and economic elements of the fishery at a time when the world is recovering from a prolonged recession. Fishermen suggest that government hope to prosper from the current recession as fishermen will be forced to leave the industry voluntarily, rather than through expensive government funded decommissioning schemes.

Regulator Inject Number    Time

The recent marketing of fish products by celebrity chefs has reinforced the perceived health benefits of eating fish and subsequently demand for fish has increased. However, the campaign supported by large supermarket chains, is likely to be damaging for Spokane fishermen. In the US, salmon and tuna are among the popular species purchased in supermarkets, but the campaign promises to remove these species if caught from unsustainable fisheries. Fishermen are lobbying government for increased allowable catches that they say will be needed to protect against low profits as demand decreases. However, conservationists suggest this is a ploy by fishermen because the average consumer will
purchase popular fish as long as they are cheap, irrespective of whether they are sourced from sustainable or unsustainable fisheries.

**Regulator Inject Number**   Time

Regulation of the Spokane Fishery has increased in recent years. Fishermen have played an active role in the implementation of these regulations and have abided by them. As a result, a recently published report suggests that stocks are showing signs of recovery and that fisheries management is actually working. While scientists suggest increases in stock abundance should be managed cautiously, fishermen are lobbying for increased allowable catches as payback for the increase in stocks as a result of adopting stringent legislation in recent years.

**Regulator Inject Number**   Time

Conservationists are bemused that total allowable catches may be increased by as much as 30% next year, especially when a recent report quotes regulators and politicians referring to discards as immoral. While conservationists agree that some stocks seem to be showing signs of recovery, they argue adamantly that to increase catches now would be the same as taking one step forward and two steps back and do nothing to solve the discarding or overexploitation problem. The increase in fish stocks has proven what conservationists have been saying for a long time – manage fisheries better with long term sustainability in mind and we will all be rewarded by greater levels of fish in the ocean, not just now but for future generations. Allowing an increase in catches sends a clear message to the general public – the ocean is a resource that we will exploited for economic gains at the cost of today’s and future generations.

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Inject – Stakeholder Negotiation Group Meeting

In 10 minutes you will attend a stakeholder negotiation group meeting. The meeting provides you with an opportunity to discuss your aspirations for management of the Fishery. You should be prepared to discuss with the other players who are likely to have rival demands that conflict with yours.

After 10 minutes of discussion, each player will have 2 minute to put their demands to the regulator before the meeting closes and the regulator decides on quota for the next year.

Inject – regulator to devise quota for next year
Following the 1st stakeholder negotiation group meeting, the regulator now has 5 minutes in which to decide the level of catches for the Spokane Fishery for next year. The regulator will advise the other players of the new level of catch stating the reasons behind the quota level set.

Inject – 2nd Stakeholder Negotiation Group Meeting

In 10 minutes you will attend your second stakeholder negotiation group meeting. The second meeting will run to the same format as the first. You will, therefore, discuss with the other players for 10 minutes and then have 2 minute at the end of the meeting to tell the regulator your demands and why they are important to you. You may wish to reflect on what you asked for last time and what events have taken place since.

Appendix C: Ballott Paper

Election Ballot Paper

An election will be held in 1 minute. You have the opportunity to decide whether the regulator remains in his/her role or be removed from their role and be replaced.

A YES vote indicates you are happy with the current regulator and you wish for them to remain in their current position. To vote YES cross the box below.

A NO vote indicates you are not happy with the current regulator and you wish for them to be removed from their position and be replaced. To vote NO cross the box below.