4. Decision Theory and its Role in Fisheries Management

4.1 Introduction

Decision Theory has applicability only when (a), there is more than one choice of action possible, and (b), it is uncertain which course of action will provide more benefits in terms of the desired objectives. In fact in this context, some people (such as myself) see Fisheries Management as a subset of Decision Theory, rather than the converse. As noted, central to considerations of Decision Theory methods is the existence of *Uncertainty* as to what the future state of a system will be, or what will be the outcome of taking a particular decision.

Decision making in fisheries may arise in two contexts. In some cases decisions about a management action have to be made on a regular basis, e.g. each year a TAC may have to be chosen from a range of possibilities, or an optimum rate of resource rent set that maximizes returns to the resource owners (the state?) without deterring investment and economic activity in the fishery. In other cases, decisions may refer to situations that arise irregularly, e.g. whether to introduce tradable property rights into a fishery. This discussion will focus on the first of these cases because this situation demonstrates the arguments that can be made and is one that occurs commonly in fisheries, every year in fact. But they equally apply to both situations. The second situation, of a single event or once-only decision, tends to be more complex in that it melds into the theory of strategic planning, a discipline that is, in my view, one that is still developing in the fisheries management context.

In approaching this topic one may ask, who is the decision-maker? For our purposes, it can be an individual - the minister, it can be a departmental committee or it can be some combination of various stakeholders. All that is required is that at some point a single view can be expressed that represents the group. The decision may be to make no change or take no action, a form of null response, but it still should be considered a positive action from a decision theoretic perspective.

Consider the case of setting an annual TAC. Here a decision equivalent to

$$TAC = a_i$$

is taken. Conceptually,

$$0 \leq a_i \leq \infty$$

as the TAC may be set to zero or any positive number (note, setting a TAC does not necessary imply that it will be caught!). Here ∞ represents the maximum conceivable biomass that the stock may attain. One can say that in deciding upon the TAC a specific action is taken, i.e. TAC = a_i. Which action to take will depend upon the decision makers expectation of, e.g. the biomass of the stock in question, its productivity plus, perhaps, many other factors such as the oceanographic regime, the stock age structure and even non-biological factors such as the expected price to be received for the catch, and the financial condition of the industry (e.g. widespread cash flow problems, etc.) and economic situation of the country.

What is the 'best' action to take will depend on these factors, and perhaps other variables, which might all be subsumed into a parameter θ such that they have a density function $f(\mathbf{x}; \theta)$. If θ and the form of the function (e.g. Γ or log-normal) was known, the density function would be known and thus too would be known what is the best action, **a**, to take.

One may have a number of observations $\mathbf{x_i}$ upon which to decide on an action. This is done by defining (or developing) some function *d* of the information, the $\mathbf{x_i}$, that are available. Thus,

$$\mathbf{a} = d\ (\mathbf{x_1}, \mathbf{x_2}, \ldots\ldots \mathbf{x_n}).$$

That is, if we observe $x_1, x_2, \ldots x_n$, the action a = $d(x_1, x_2, \ldots x_n)$ is taken. The function *d* is called the *decision function*, or to be sometimes confusing because the term is used in a wide range of non-technical contexts, the strategy. Clearly any number of decision functions may exist. For example, if you were a true believer in trawl surveys and a somewhat sceptic of VPAs or related cohort analyses methods, your decision function for estimating stock biomass might be:

$$d \ = \ [\ 2\ \mathbf{x_{TS}} + \mathbf{x_{VPA}}\ ] / 3$$

where **x** = biomass.

What might the $\mathbf{x_I}$ be? These 'state variables' will be any phenomenon that affect the outcome of the decision, e.g. stock biomass, species dependent effects, age structure, size-fecundity relations and in some fisheries, and physical changes such as large scale decadal oceanographic phenomena. It might even include some degree of belief about the accuracy of the data that have been used in obtaining the estimates. The action taken might be to set, as is the Icelandic decision rule,

$$TAC = 0.25\ \mathbf{x}$$

or as for the North Sea,

$$TAC = 0.6\ \mathbf{x}$$

To evaluate a decision function, one needs to know the consequences of a given action and this is done through a *loss function* which may be denoted $l(a;\ \theta)$. This represents the loss in taking action a when θ is the parameter for the system, or state space. If a is the best action for θ, then the loss will be zero. Of course in reality, all that might be known is that θ has a particular distribution and not its parametric value. The decision action that produces the corresponding loss can be expressed as:

$$l(\mathbf{a};\ \theta) = l\{[d(\mathbf{x_1}, \mathbf{x_2}, \ldots\ldots \mathbf{x_n});\ \theta]$$

where the $\boldsymbol{x_I}$ are the biomass estimates from the various sources, or other variables that influence the decision function.

Once the loss and decision functions have been prescribed, the loss will depend on the observations that are obtained because the $\mathbf{x_i}$ will be random variables (e.g. just as the result of a trawl survey is a random variable depending on what stations were chosen, or a VPA depends on the lengths of the fish in the samples that were measured). Hence it is appropriate to consider the average value of $l(\mathbf{a};\ \theta)$, which in Decision Theory is called the *risk*, (but see Section 4.2 too). The expected loss will depend on the decision function, d, the loss function, f, and the value of the parameter, θ, that is chosen. Hence,

$$R(d;\ \theta) = E[l(\mathbf{a};\ \theta)]$$

A good decision function is one that minimizes the risk for every value of θ in the parameter space, conventionally expressed as $\theta \in \Omega$, i.e. for every value that θ may have. In point estimation, a good strategy is to select $\theta = 1/n\ (\Sigma x_i)$.

One of the difficulties in using decision theory in applied problems is that of specifying a realistic loss function. Usually for computational reasons, a squared-error loss function is chosen, as when the coefficients in a linear regression are calculated. However, if "good" procedures are being used, then the selection of the best decision is usually insensitive to small changes in the form of the loss function. In practice a decision maker would undertake some simulations of the system state to locate areas of the parameter response surface where the estimated loss was least variable in terms of changes in the parameter(s) value(s).

4.2 A Look at Risk from Another Perspective

In Section 4.1, a common Decision Theory definition of risk was given. But there are a number of other perspectives of the term risk and it may diminish, rather than increase, confusion, to briefly examine them.

The concept, or term "risk" has appeared frequently in the fisheries management literature as scientists seek better ways to advise fishery managers or in promoting adoption of the precautionary approach to fisheries management. Though terminology varies, there is an emerging consensus that there are two stages in dealing with risk. The first (here called risk assessment) is the formulation of advice for fisheries managers in a way that conveys the possible consequences of uncertainty. Such advice takes the form of an evaluation of the expected effects of alternative management options, rather than recommendations. Risk assessment has been undertaken in many fisheries and there is general agreement as to how it should be done (although technical details differ). The second stage (risk management) is the way fishery managers take uncertainty into account in making decisions. Much fisheries risk management is informal, i.e. non-quantitative, undocumented, and loosely linked (if at all) with a risk assessment. The major reason for this is that the objectives of fisheries management are often conflicting and are rarely stated in a way that provides explicit direction to managers and scientists. For example, ministers characteristically wish to maximize short-term, or immediate employment in the fisheries by increasing the numbers of licensed fishermen and thus increasing the fishing effort, even when the resource is fully exploited. They also want to maintain or increase sustainable levels of catch, which may only be possible by reducing levels of fishing effort.

Although many applications of the term *risk* in fisheries management have been non-technical (i.e. the word has been used in one of its normal English meanings) an increasing number of authors have used the word in a technical sense. That is, they have assigned a specific, sometimes quantitative, meaning to their use of the word (sometimes in compound forms such as "risk analysis", "risk assessment", or "risk management"). And, there has also been an increased institutional interest in risk in relation to fisheries management with several conference s focussing on this topic. A major reason for the increasing use of "risk" in this literature appears to have been a desire on the part of fisheries scientists to improve their advice to those who manage fisheries by conveying the unavoidable uncertainty that is present in their recommendations.

In these contexts, uncertainty and risk are concepts that go together - risk is the quantitative aspect of uncertainty. Even among technocrats the word risk can mean different things. Most commonly it is used to mean that something bad *could* happen. The trawler may sink; the market may be oversupplied with fish and their price collapses; there may be a series of recruitment failures; or all of these may happen. In this sense, the term risk then implies

i. there is a possibility of the bad event happening, i.e. it has finite, if unknown, probability of happening and

ii. a loss (or cost) is incurred when it does.

4.3 How do Managers Deal With Risk?

To answer this question, the two elements, (i) and (ii) need to be considered in further detail. Consider the case where the probability[1] of an event happening has a probability of p, and that if it happens, a gain of *L* will occur. Then the expected gain from the event will be p*L*. If an investment was needed so as to participate as a potential recipient of the gain, a case can be made that a rational decision-maker, or investor, would not pay more than *pL* for the opportunity of being a stakeholder in the outcome of the process. If he paid more, he would loose money (at least on average). A decision-maker that would pay up to *pL* to participate would be described as risk neutral. Some cognitive psychologists would describe such behaviour as 'rational'. If he was prepared to pay only less than *p L*, he could be described as *risk averse* (In fact, in this case, you will probably not find rational investors prepared to offer this option - if you do, suspect a fraud!). For example, how much should one pay to participate in a toss of the coin for $100 (or $10 000 - does your behaviour change?)? If a player was prepared to pay more than *pL*, the person would be described as risk prone, and if he were to continue playing the game he would, on average, loose money.

Strangely enough (to some), many people change their attitude to risk when the outcome of the event changes from a possible win to a certain loss. Consider the case where you owe someone $100 (or $10 000). You are offered the chance for the debt to be cancelled by paying for the opportunity of tossing a coin. If you choose correctly the debt is cancelled. Some people will be willing to pay more than $50 (note p =0.5; 0.5 x $100 = $50) - that is they would be happy to pay an extra premium to avoid a possible loss. This person can be described as *risk prone* or *risk seeking*[2]. The expectation is that he would loose money, at least if he were to continue paying such an amount for repeated bets such as this. There is evidence that such people are not that uncommon in their inconsistent approach to risk. When offered the opportunity to pay for a fair bet, they will only pay less than the certainty-equivalent. But if the choice is between a gamble and a certain loss, their risk preference switches to being risk-prone. Of course, these situations are fairly simple, at most people should quickly see when their behaviour is 'irrational' as they see their assets decline. But not all such decision-making situations are that simple.

Does such behaviour (sometime called *cognitive response*) have an application in fisheries? In these days of the Precautionary Approach, risk aversion is of particular interest.

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[1] Here the term probability is used in a quantitative sense, and not in the qualitative sense that an event is considered to be likely. For example, in a fair toss of a dice, the 'probability of getting any particular face' is 1/6; in the toss of a coin, the probability of a heads (or tail) is ½.

[2] Strict definitions of these terms are: *Risk Aversion* - One is risk averse if and only if the expected consequence of a lottery is preferred to that lottery. *Risk Neutrality* - One is risk neutral is and only if the expected consequence of any lottery is indifferent to that lottery. *Risk Proneness* - One is risk prone if and only if the expected consequence of any lottery is less preferred than that of the lottery.

However, consider the case where a decision-maker must take action on deciding about the size of a TAC. The advice he is given is that current levels of harvesting pose a probability of 0.6 of stock collapse, or some other form of resource conservation damage, if fishing effort is not reduced, possibly significantly. He has the option to (a) do nothing, (b) reduce the TAC, or, to be complete, (c) raise the TAC which will not be considered a feasible option here. The decision-maker knows that the industry will resist a reduction in the TAC (and why this might be so is another management story), and that the minister wishes to avoid decisions that may create controversy (i.e. personal unpopularity).

If the Minister asks the resource analyst, 'are you certain that there will be resource damage if I do not lower the TAC?" the honest answer of the advisor will be "no" as there is a probability of 0.4 that the continued level of fishing effort will not harm the stock[3]. The advisor may then propose that the minister appeal to the *precautionary principle* but because of its operational vagueness, the minister knows that this is not ammunition that will win any negotiating rounds with the industry. Thus, he follows his political instincts and says, "given existing resource requirements of the industry, the need to maintain employment, etc., and the lack of certainty in resource assessments, it has been decided to maintain the TAC". What he might have said is, "In these circumstances, I will take a risk-prone decision to maintain the TAC even though the expectation is that this will result in a longer term loss to the industry. If I an lucky, this will not happen - there may be good recruitment next year, and besides, the survey result may have underestimated the true stock size".

Does this happen? In a word, YES! In Canada there was an explicit policy that when there was a recommendation for the northern cod fishery to reduce a TAC say by **x** tonnes, a reduction of **x/2** tonnes was made. That is an explicit risk-prone policy that was pursued. On average, or in the longer term, it would involve costs that would far exceed the gains. And because stocks can suffer recruitment failure and collapse (as indeed did northern cod), the events in the "game" being played are not independent trials in which θ remains the same, rather both this parameter and the functional relationship change. It is at this point that Risk Management becomes an essential ability in the bag of tools of the analyst.

[3] For example, if the estimates of stock biomass and thus TAC, are based on a random trawl survey, there will be an associated confidence interval. The true, but unknown, value might be near the high end of its range.

Another phenomenon may be at play here. When decision-makers have not been subject to a particular disaster before, such as a major fish stock collapse, it can be difficult for them to perceive the probability of such an event happening, this is sometimes referred to as *disaster myopia.* Behavioural psychologists refer to this with the completely perplexing term of *availability heuristic*. Thus, analysts need somehow to distance themselves from subjective views as to the probability of such infrequent events.

The problem of different attitudes to *risk* can arise at other levels than that of a senior decision-maker. Consider the situation where the resource advisor presents the same information to a stakeholders' management committee that he presented to the minister. There are two gear sectors represented on this committee (e.g. gill-netters and trawlers). The gill-netters have had several poor seasons and most are heavily indebted. The reverse is the case for the dragger fleet. You can easily predict the likely attitudes to risk of the different groups. The gill-netters may be forced into bankruptcy if the resource advice is accepted where as the trawlers can afford to wait and profit from the resource recovery (should it happen). The chairman of this committee will find that one set of the stakeholders may be risk-prone, the other risk averse, and both agree on the facts of the matter, even if this is not openly admitted[4].

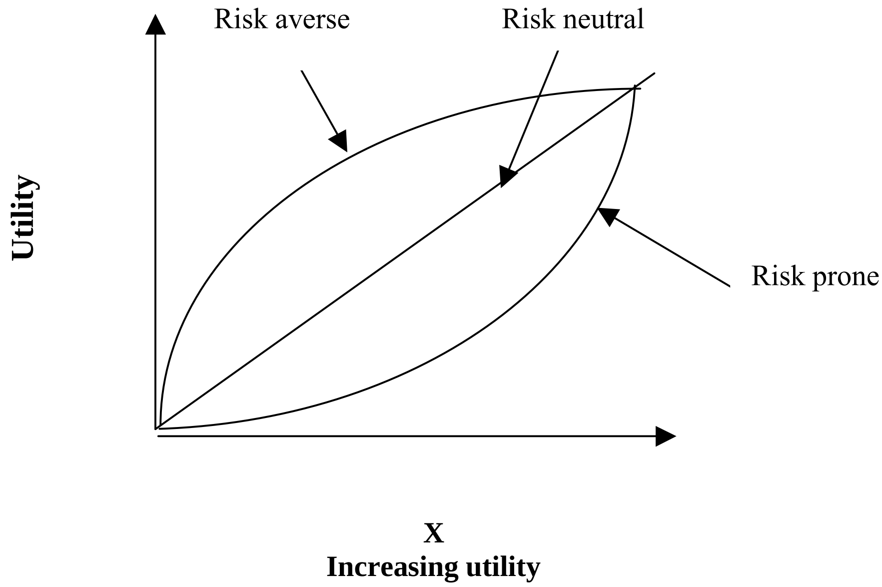
This type of situation may prevent any agreement on an appropriate decision regarding the next season's TAC and for this reasons management authorities often try to encourage, or coerce, the industry into single bargaining units so that compromises are forced before they get to the negotiating table. Such tactics are usually unsuccessful in the longer term though as the different groups soon realise that their interests are better served through independent action. Thus, those with divergent interests split to form their own lobbying group.

4.4 Utility

Decision Theory has an explicit method of dealing with situations where stakeholders, who may agree completely on the facts of the situation (e.g. θ, d, etc.) but insist upon different actions. This is handled through the concept of *Utility*. This measures how much a particular *attribute* is valued. Here the attribute in question may be that of catch landed, or TAC. In this case, it is usual that there will be a linear relation between utility and TAC - the more catch the better. But this is not necessarily so. In the HOK1 hoki (*Macruronus novaezealandiae*) fishery in New Zealand, the industry collective agreed to harvest less than the TAC because of price elasticities; more revenues were possible from a lower level of catch. In this case less utility was associated with a higher level of catch; but the relation between profits and utility was presumably more-or-less linear: twice as much profit had twice the utility as well.

Section 4.3 showed that the concepts of risk and utility are linked and their relation depends on the attitude to risk of the decision-maker. This is illustrated by Figure 1. This figure shows that for increasing utility of some attribute, the utility declines for the risk-averse decision-maker, while the reverse if true for the reckless gambler. A strict linear relation holds for the risk-neutral decision-maker.

Figure 1
Increasing Utility Functions



Decision makers may not be consistent in the attitude to risk as their asset position changes. For example, a careful planner may consider paying off the mortgage on his boat to be his priority. But once that is done he may consider buying shares on the stock market, which provide a much less certain return on the investment. In other words, given his asset position the decision-maker can feel he can take a gamble.

[4] This type of behaviour is sometimes seen in another context within quota management systems where often, those companies caught exceeding their quota are heavily indebted and go out of business once they are apprehended. In their

The risk preference of the decision-makers may also depend on the stake that is involved. Millions of people make risk prone investments when they buy a lottery ticket (I among them) - after all the expected return is less than the investment - we prefer the lottery to the expected value - the stake or price of the ticket and the probability of winning as we prefer the lottery to the certainty of the stake – the price of the ticket.

Differences in the utility of some asset may exist among decision-makers (here they may be fishermen) if the value of the asset is linked to possession of some other asset. An example could be in rights-based fisheries where bycatch is taken in conjunction with the target species and the fisherman must posses quota for both targeted and bycatch species. In this case the utility of the bycatch will be greater to him that to another fishermen not subject to this constraint. But this is common sense. In this case there is said to be utility interdependence between the two attributes. Analysts should be aware of this as it may distort values for fishery products that are the subject of negotiations.

4.5 Time Preferences and Discount Rates

It is commonly observed that the perceived value of some future benefit depends on how long it is before that benefit is to be obtained (with the value generally declining with increasing time). This is what is called future discounting, or the concept of time preference in relation to future benefits. The conventional way to deal with this is to express all values in present terms, using a discount rate. For example, the present value of $1000 that is to be received in 5 years' time is $\$1000\ (1 + x/100)^{-5}$, where x is the discount rate (expressed as a percentage). The bigger x is, the more the future is discounted (i.e. the smaller is the present value of a given future benefit).

The relevance of future discounting to fisheries management is apparent when, if under certain conditions, the discount rate of decision makers with regard to future benefits from a fish stock is high enough, there is no reason to conserve the stock[5]. In the construction of objective functions for fishery management, discount rates will clearly be relevant for any management options that cover more than one year. However, although they have been used

case, risk-prone behaviour is a rational response to their precarious financial situation.

[5] Many authors have published on this topic, examples include C.W. Clark 1976. Mathematical Bioeconomics. John Interscience and W. Silvert 1977. The Economics of Overfishing. Trans. Am. Fish. Soc. 102(6):121-130.

and discussed in many theoretical fisheries papers their explicit use in fisheries management decisions appears to be rare.

Where the precautionary approach to fisheries management is adopted it would seem that discount rates would have application only in short-term management decisions. For decisions with long-term consequences the issue of inter-generational equity, which is so central to the precautionary approach would seem to preclude the use of discount rates. For example, even a relatively low discount rate of 2.5% implies that the importance of each successive generation declines by a factor of almost 2 per year and assuming a human generation time of 25 years).

It is important to be sure what is being discounted. Suppose, for example, you are offered a choice between receiving both $750 today and $750 tomorrow, or just $1000 today. If you choose the latter you are likely to be judged as having a high rate of future discounting. However, it could be that the reason for your choice is that you consider money offered today to be certain, but that you have doubts as to whether that promised for tomorrow will actually materialise (you have glimpsed the ticket to South America of the person who is to pay you tomorrow) . In other words what you are discounting is not the future value of money, it is the likelihood of receiving it. Now, consider a common situation in which fishers voice a preference for a management option that gives them a high catch in the next year followed by a period of lower catches, over an option that provides medium catches over the whole period. Does this preference stem from their discounting the future value of catches (or money), or are they actually discounting the stock assessment (i.e. the prediction that a high catch next year will need to be followed by a period of low catches)? One might deal with the former type of discounting by incorporating a discount rate in the objective function; this would not be appropriate with the latter type.

Whose Discount Rate?

When discount rates are high among a group of negotiators, great difficulty may occur in agreeing to a conservation action that requires deferring a benefit. The classic example already raised, is that of accepting a reduction in the TAC for the following season in anticipation that it will lead to rebuilding of the stock and thus greater returns in the long term. As noted above, if the rate of stock growth is expected to be less that a stakeholder's discount rate, if he understands the issues, and acts as a rational or certainty-equivalent decision maker he will not agree to deferring the benefit. And just as a group of stakeholders may have different attitudes to risk, so they may differ in their time preferences or discount rates. Personal circumstances may have a lot to do in determining discount rates. If one's wife needs urgent medical care, and one has few funds available, then restraining this year's harvest to gain an addition 10% next year will probably be insufficient incentive. Discount rates, and thus time preferences, may also vary within a group of similar stakeholders, increasing difficulty in achieving agreement upon a course of management action.

As noted, a decision concerning a course of action in relation to conservation may depend on the discount rate that is being used. If the discount rate is extremely high, then cost-benefit analyses will rarely show benefits in deferring immediate production in exchange for future larger benefits. The discount rate of commercial companies is often around what they must pay for their costs of finance plus the normal expectation of rate of profit. Governments, on the other hand usually have lower rates, termed the *social discount rate,* which invariably are lower than the commercial rate. Determining an appropriate discount rate to use in cost-benefit analyses is not a trivial task and is a area of major concern for many economists[6].

4.6 Loss Functions in Fisheries Management

Discusisons in several parts of this chapter have raised the issue of loss functions as important elements in determining the best action to take in a situation of uncertainty. In fact most people who read this will have already encountered one form of a very robust loss function - the squared error loss function:

$$l(\mathrm{a};\ \theta) = \mathrm{f}\ (\theta_i - \theta)^2$$

which will be familiar to anyone who has fitted a least-squares regression model. Unlike this parameter fitting situation, losses arising from decisions about the true value of $\boldsymbol{\theta}$, which we can take to represent the state equation, will not be symmetrical about the parametric mean. Here, the discussion will be restricted solely to estimating the optimum TAC.

[6] The recent contribution to this field is that of Discounting and Intergenerational Equity by Portney & Weyant (Eds). Resources for the Future.

What are the consequences of setting the TAC to high? The easiest situation to deal with is that where growth overfishing results - that is the average increase in stock biomass that would have occurred in the absence of (increased) fishing is greater than the reduction in stock biomass because of natural mortality at the same level of fishing effort. In this case, reducing the TAC would reduce fishing mortality allowing the fish to grow. Thus the loss would be the difference between the vector of TACs that are taken, or arise, when there is growth overfishing in the first year of the series under consideration, and the vector of TACs that would have arisen if fishing mortality was at the level that maximized biomass yield or some other lower level. It is clear that such calculations require assumptions about future harvest plans and here various scenarios may be explored, or an adaptive approach may be assumed, in which the optimal yield is assumed to occur in the second and subsequent years.

The loss arising from setting the TAC too low will be the converse of this situation. The fish that could have been caught but are not because $TAC_i < TAC_{opt}$, will continue to grow but the loss of biomass caused by natural mortality will exceed the gains from their somatic growth.

If stock-recruit relations are considered, the situation becomes more complicated, not least because it requires, what some believe is a leap of faith that a useable stock-recruitment relation exists for the population in question - and can be described in the form of a functional relationship. At this point the loss function must now consider all those factors that determine fecundity - age structure and age at maturity; fecundity as a function of age/size; egg and larval survival as a function of egg size and number of eggs and, if this is possible - invariably it is not except at a gross level[7]- environmental affects. Glossing over these inconvenient realities, over-harvesting that contributes to reduced recruitment will have a loss resulting from the forgone catch that would have arisen from the recruits that would have otherwise existed. Depending on the age structure of the exploited stock in the management year under consideration there may also be growth under- or overfishing effects as well complementary to the stock - recruitment situation.

If it is believed that the resource has been over-exploited, and the TAC is reduced, then two scenarios must be considered: (a) the assumption was right - the resource was over harvested, and (b), the assumption was wrong, it was not over-harvested. In the first case the "loss", which in this case will be negative, will be the difference between the forgone additional yield less the drop in yield in the following year AND the yields that are subsequently taken. A negative loss is in fact a gain as increases in successive harvests should exceed the short-term reductions. Note that in this sense setting the harvesting strategy is like a sequential game as each year the opportunity exists to decide on a new action regarding subsequent harvesting decisions. In the second situation where the resource was not over-harvested, catch forgone in year one can be caught in year two subject to growth and natural mortality considerations.

These assumptions about loss functions have been explored solely in terms of biomass. But commercial companies have many other considerations that will influence their negotiating position in relation to establishing a multi-year TAC schedule. First and foremost, is that companies have ongoing commitments, both of a fixed-cost nature, i.e. costs which continue, irrespective of the level of their fishing operations if any at all. These are mainly those for capital financing, many insurance costs and perhaps debt repayments. Also, many salary costs may be fixed e.g. for shore management and maintenance. For this they must maintain a cash flow, i.e. ongoing harvests.

Another major consideration of fish processors is continuity of supplies. In the first instance this keeps their factories going and by avoiding large fluctuations in throughput, costs can be better managed. But, perhaps, even more important than this is the need to maintain customer loyalty and even product demand. Customers, be they other retail levels or the final consumers, can be irreversibly lost, not only to other suppliers, but to substitute products. For example, after the crash of herring stocks in the North Sea, it was reported that a major part of the English market lost their taste for strongly flavoured smoked 'red' herrings[8] - the market never recovered when the stocks did. Thus the industry's loss function may look quite different to one determined solely by biomass considerations along - though of course, a depleted resource serves no body.

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[7] For example it might be known if it is an *El Niño* year.

[8] Those who have ever smelt one of the ‘delicacies, will understand the origin of the phrase to follow a “red herring”.