

Marine Scotland

An Appraisal of the Options for the Allocation
of Fishing Opportunities in Scotland

Summary of research commissioned
by Marine Scotland

This report is available on the Scottish Government Marine Scotland website www.scotland.gov.uk/Topics/marine/science/mau/Relpub

The views expressed in this report are those of the researcher and do not necessarily represent those of the Scottish Government or Scottish Ministers.

© Crown copyright 2014

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit <http://www.nationalarchives.gov.uk/doc/open-government-licence/> or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or e-mail: psi@nationalarchives.gsi.gov.uk

An Appraisal of the Options for the Allocation of Fishing Opportunities in Scotland

1. Introduction by Marine Scotland
2. Options for change

Annexes

1. Relevant overseas experience
2. Consultation responses

1 INTRODUCTION by Marine Scotland

- 1.1. This summary report sets out some of the key findings of research commissioned by Marine Scotland and submitted between January and April 2014. The purpose of the research is to inform debate and policy development concerning the available options for the management of Scottish quota.
- 1.2. Marine Scotland commissioned consultants to undertake this study after a competitive tendering process. The terms of reference stated that “the project will consider the options available to Scottish Ministers to amend or reform the relevant quota management systems in ways which provide net benefits to Scotland.”
- 1.3. “The aim of this project is to provide Ministers and officials with a body of evidence to inform current policy making decisions on the future allocation of fish quotas which will meet the Scottish Government’s aims of sustainable economic growth through a more productive and efficient fishing sector which supports solidarity and cohesion in Scottish communities.”
- 1.4. The research objectives for this project included:
 - consider and analyse evidence relating to the functioning and impacts of the current system
 - review the lessons from theory and from experiences in fisheries and any other relevant sectors from around the world
 - develop options for Scotland, including for small or incremental changes, which have the potential to result in net benefits
- 1.5. This summary report sets out the results of the work which has been undertaken with further detail included in annexes.
- 1.6. Section 2 outlines the options for change;
- 1.7. Annex 1 provides detail on relevant overseas experience. A consultation programme was undertaken with the fishing industry and the results of that are summarised in Annex 2.
- 1.8. The opinions expressed in this report are those of the consultants, unless clearly indicated otherwise.

2 Options Analysis

- 2.1. In this section the various options for allocating fishing opportunities are examined, assessed and evaluated. This options analysis is undertaken within the context set out by the Terms of Reference (TOR) for the project. According to the TOR, the aim of the Scottish Government is to achieve both economic efficiency and community cohesion.
- 2.2. The objective of economic efficiency alone strongly suggests the option of allocating fishing opportunities on the basis of ITQs, while the objective of community cohesion alone could be pursued by returning to a non-rights based management system - effectively abandoning the existing FQA system. Both of these options are outlined as diametrically opposed systems of fisheries management.
- 2.3. The third option of trying to achieve both economic efficiency and community cohesion through reforming the existing FQA system is then explored. A number of specific proposals for reform within this third option are then assessed using a variety of quantitative analytical techniques. Some recommendations are then made on the basis of this analysis. A fourth option is simply to maintain the FQA system as it is – a do nothing option in other words.
- 2.4. A summary of recommendations is then provided.

Terms of Reference (TOR)

- 2.5 The Concordat provides Scotland with the prospect of engineering quota allocation policy to fit with the national reality and cross cutting policy. As already noted the TOR for this study clearly sets out the Scottish Government's aim of 'sustainable economic growth through a more productive and efficient fishing sector which supports solidarity and cohesion in Scottish communities'.
- 2.6. Can economic efficiency be reconciled with community solidarity and cohesion? In short, is it possible for a single quota allocation option to achieve both objectives? At one level the answer is no.
- 2.7. Maximizing economic efficiency means letting market forces determine the size and shape of the Scottish fishing industry in the future. The likely consequence would be a more profitable but smaller fleet concentrated in a few ports and owned by a small group of companies. This is one option.
- 2.8. While the Scottish Government clearly wants to see a profitable and efficient fleet, it does not appear to be inclined to allow unfettered market forces

determine the future of the industry. Indeed, in the invitation to tender, it is stated that 'it will not be acceptable to Ministers for the wholesale consolidation of fishing activity into a small handful of ports and the benefits of Scottish fisheries to be captured entirely by a lucky few.'

- 2.9. This stated Government position confirms the importance of community solidarity and cohesion as objectives for the Scottish Government. To achieve this objective strongly suggests replacing the current FQA system with a quota management approach that explicitly favours social objectives. This is a second option.
- 2.10. Instead of a stark choice between economic efficiency and social cohesion, an alternative option of trying to achieve some aspects of both through reforming the existing FQA system suggests itself. This is a third option.
- 2.11. The fourth option is to maintain the status quo and continue to operate the FQA system without any changes.

Approach

- 2.12. Throughout the world there are a large variety of fisheries management schemes and in a number of countries there are different approaches for individual fleet segments in recognition of the reality that given the nature of the different fisheries one-size-does-not-fit-all. Given the strong differences in the character of the individual Scottish fishery segments, such an approach is considered appropriate for Scotland. What may be appropriate for the Scottish pelagic quota, for example, may not be applicable to the demersal and nephrops fisheries.
- 2.13. At the same time, whatever today may be possible in the demersal sector could very well change in the medium to long term, especially if there is the hoped for recovery in the status of all stocks to maximum sustainable yield (MSY). In considering the options for the future, fishery managers and stakeholders therefore need to remain pragmatic and flexible.
- 2.14. In light of the different (and potentially conflicting) aims of the Scottish Government, this options analysis reviews a number of quota management options under the following four option headings
 - **Introduce ITQs.** Maximization of economic efficiency through the introduction of a system of ITQs
 - **Return to a non-rights based system.** Ensuring community solidarity and cohesion through an abandonment of the FQA system and returning to a non-rights based quota management system.

- **Reform the FQA system.** Attempting to reconcile the two conflicting aims of economic efficiency and social cohesion by reforming the existing FQA system.
 - **Maintain the Status Quo.** To continue to operate the existing FQA system without making any changes.
- 2.15. These four option headings are cross-sectorial in that each covers the three main fishing sectors of pelagic, white fish and nephrops. It goes without saying that each fishing sector is quite different and has its unique characteristics. Notwithstanding this, all three sectors operate under the same FQA system at the present time and, in looking at proposals for future changes to this system, all three sectors are considered together. Where there are sectorial differences these are however highlighted and discussed.

Introduction of ITQs

- 2.16. The introduction of ITQs in fisheries around the world has almost always been associated with a considerable improvement in economic efficiency and profitability.¹ If economic efficiency and profit maximization are the main objectives of the Scottish Government then the obvious option would be to change the current FQA system from what is a de facto ITQ scheme into a formal de jure ITQ scheme. This would bring a large number of benefits as well as presenting a clear signal that there is a new approach to fisheries management.
- 2.17. An ITQ scheme would be able to confirm the property right characteristics thus reducing uncertainty and potentially lowering the risk for any new investments. An ITQ system established on the basis of the New Zealand one, for example, would provide quota owners with an environment where they could maximise profits, use their quota holdings as security for funding new investments and freely buy and sell quota without any restriction. While the existing FQA system does confer some of the advantages of an ITQ system, in terms of the perceived property rights of FQAs, a move to ITQs would put beyond any doubt the actual and enduring legal title to quota assets.
- 2.18. The aim would be that over time the Scottish fleet would become the optimum size to generate maximum profitability from the available resource. The New Zealand model is probably most applicable to the Scottish pelagic sector given its small size and simple structure - the pelagic sector only consists of four fisheries prosecuted by 24 pelagic trawlers. A system based on the Danish model, which covers the complexity of the Danish white fish

¹ Catch Share Design Manual, Environmental Defense Fund.

and shellfish industry, is therefore probably more suitable to the Scottish white fish and nephrops sectors.

- 2.19. Having said that, there is a fundamental and important difference between the two models. In New Zealand there is a legal title to fish quota without time limit, whereas in Denmark the system is time limited in that the Danish State has the right to change the quota management system subject to giving eight years notice. This so called quota retrieval model, which allows the rights to be revoked subject to Government giving eight years notice, is a significant departure from the classic ITQ model.
- 2.20. Given that legal title is an essential feature of the classic ITQ model, advocates of this model would argue that such a time limit (however unlikely it may be deemed that the Government would actually fundamentally alter the successful Danish system) acts as a disincentive to long-term investment decisions. Supporters, however, argue that the Danish system offers most of the advantages of ITQs but keeps open the possibility of policy change. In the New Zealand model the Government has no basis in law for interfering with the legally held quotas of individuals who hold legal title to their assets.
- 2.21. In this context it is interesting to recall that the Scottish Government has previously considered the possibility of providing security for FQA holders for a seven-year rolling period.² This proposal, known as stewardship rights, would have provided a much greater degree of security to quota holders than exists currently but would still not have provided the legal title to quota assets that is conferred by an ITQ system. This proposal would, in short, have provided a degree of security for FQA holders not dissimilar to that currently enjoyed by Danish fishermen.
- 2.22. The introduction of an ITQ based model for managing fisheries has seen the profitability of the fishing fleet increase considerably in, for example, New Zealand, Iceland, Denmark, the Peruvian & Chilean anchovy fishery and the Alaskan halibut fishery. It is therefore expected that fisheries management based on an ITQ model would also optimise profitability of the catching sector in Scotland. A further advantage, which has sometimes not been fully recognised, is the benefit that would accrue to Government.
- 2.23. A more profitable fleet would yield greater tax revenue than is raised under the current system. Insofar as the Scottish Government is concerned, the introduction of an ITQ system would also substantially reduce the administrative costs of managing quotas. Indeed it could be argued that, in return for securing the legal title of fish quotas at no cost (FQAs were, of

² Safeguarding Our Fishing Rights: The Future of Quota Management and Licensing in Scotland. 2009

course, allocated for free in 1999), the industry should be prepared to cover all fishery management costs related to administration, enforcement and provision of scientific advice.

- 2.24. This is exactly the trade off which occurred in New Zealand where fishing companies were given high value quota rights for free on the condition that Government had no ongoing costs associated with fisheries management. Insofar as Scotland is concerned it is understood that the annual cost to the public purse of fisheries is currently about £25 million.
- 2.25. Another way of achieving this would be for Government to charge a royalty or tax on quota holders. This is done in Iceland where a resource rent of 9.5% is levied. Although the introduction of additional taxation (which is what a *resource rent* would effectively be) is a power that is not currently available to the Scottish Government, the situation after the 2014 Independence Referendum could be different.
- 2.26. Such tax raising powers would be available in an independent Scotland and might well be available in any devo max constitutional settlement. A case can be made that tax revenues could be used to offset social costs that might arise as a result of fisheries consolidation under an ITQ system. In any case the very considerable financial advantages of resource rent should not be ignored/discounted.
- 2.27. In summary, the introduction of an ITQ system would result in a more profitable and efficient fishing industry, while at the same time providing an opportunity for the Scottish Government to either raise an additional tax or substantially reduce its annual expenditure on fisheries. In short, it could be a win for both the private and public sectors.
- 2.28. It is anticipated, however, that the introduction of ITQs would give rise to a number of comments drawing attention to the inequity of privatizing a public resource, the limited number of vessels that are in the fishery, reduced employment opportunities, the disappearance of the fishing industry from many traditional Scottish fishing communities and the potential for ownership of Scottish quota by non-Scottish interests.
- 2.29. On the basis of the experience in other countries (including all of those fisheries referred to above which have improved their profitability as a result of introducing ITQs), an ITQ system without safeguards to reduce the potential perceived negative impacts would inevitably result in Scottish fish quotas being owned by a smaller number of fishermen and/or corporate bodies. Accordingly, it is unlikely that this option would be favoured by a Fisheries Minister who, as has been noted, is on record as stating that 'it will not be acceptable ...for the wholesale consolidation of fishing activity into a

small handful of ports and the benefits of Scottish fisheries to be captured entirely by a lucky few.’

- 2.30. Although the introduction of an unfettered ITQ system may be politically unlikely at the moment, it is important to realise the economic advantages to both the private and public sector that would accrue from the introduction of ITQs into the Scottish fishery. For this reason and for the purposes of having the ITQ option available as a template against which to compare and evaluate other options, it is recommended that the ITQ system remains an option for the Scottish Government to consider.

Return to a non-rights based system

- 2.31. If the objectives of the Scottish Government are to maximize employment, maintain community solidarity and retain social cohesion within all of Scotland’s traditional fishing villages and fishing communities then a radically different approach is needed. While social cohesion is of course determined by many more factors than fishing activity, this does play a very important role in fishing communities. The FQA system, which has evolved into a de facto ITQ system, could be abandoned and quotas instead allocated by the Scottish Government on whichever social and community criteria are considered appropriate. In other words, fisheries management in Scotland would return to a non-rights based system.
- 2.32. This option is the antithesis of the ITQ option. It would remove the sense of ownership and stewardship which FQA holders believe they have under the current system. The Scottish Government would instead assume ownership and stewardship rights. Indeed, abandonment of the FQA system would reverse the trend towards Rights Based Management (RBM) that has characterised the development of the FQA system over the past fifteen years or so. In this way the option to abandon the FQA system can be seen as being as radical and fundamental as the option to introduce ITQs.
- 2.33. The vesting of ownership and stewardship in the hands of Government would return the fishing industry to a situation currently ‘enjoyed’ by the non-sector and 10mu group where these two groups of vessels, not in membership of a PO, are allocated monthly quotas by Marine Scotland. In contrast, under the present FQA system, each PO is able to manage its sectorial quota allocation in whichever manner best suits its membership.
- 2.34. The system is dynamic, to some extent regionally based and is capable of meeting the very different needs of the huge variety and diversity of fishing vessels in membership of Scottish POs. Some vessels fish to their own annual quota, others fish to monthly limits while still others work a pool system. The PO system not only allows but also successfully manages this diversity.

- 2.35. Abandonment of the FQA system would also remove one of the main *raison d'être*s for POs. Indeed, with the effective removal of market support under the Common Market Organisation, the only role that POs now have is managing their members' quotas. As a result, abandonment of the FQA system would probably result in the disappearance of most of the Scottish POs. Possibly the only POs which would have any reason to continue (in a post market support and post FQA situation) would be those organisations which have invested in fish processing activities – namely the SFO and the Shetland PO, plus Lunar and Klondyke.
- 2.36. If Marine Scotland were to manage all fisheries on the same basis as the non-sector and the 10mu fleet then the amount of administration that would have to be undertaken by Marine Scotland in order to manage this system would increase considerably. However, by abandoning the FQA system and thereby assuming ownership and stewardship rights, the Scottish Government does not however necessarily have to undertake management of the system itself. Quota allocations could still be awarded to new quota management groups or well defined community groups.
- 2.37. Globally, group-allocated catch shares are common when the goal is to promote or benefit a specified group of participants. Reflecting the issues in forming functioning groups, such quotas have generally been implemented where one or more of the following characteristics exist: discrete fishing units with strong social bonds, common interests and values; ability of group to monitor and enforce rules; or mutually agreed upon laws, norms and methods for functioning as a group.
- 2.38. Such community quotas should not be confused with the community quotas operated by certain POs such as the Shetland PO. These community quotas have been created by POs purchasing FQAs for a specific communal purpose. As such they are a direct consequence of the FQA system. The concept of a community quota within the context of an abandonment of the FQA system is quite different. Under these circumstances, a yet to be defined group would receive an annual quota allocation from Government. This new group would then have to manage the quota.
- 2.39. Such a system raises more questions than answers. What would constitute a community group to whom a quota would be allocated? Would such a group have exclusive or inclusive membership criteria? On what basis would a quota allocation be made to such groups?
- 2.40. With regard to which kind of community groups might be allocated fish quotas to manage, there are perhaps three possibilities. In the first place fishermen's community groups, possibly bearing some similarity to the existing regional PO structure, might be used. In the second place, quotas

could perhaps be allocated to as yet undefined wider community groupings. Finally allocating quotas to the recently formed Inshore Fisheries Groups (IFGs) could be a third possibility.

- 2.41. In all cases the Scottish Government would have to justify its allocation criteria to each grouping. This might either be on the basis of historical catches or else to achieve a stated policy objective such as economic regeneration of some fishing communities in certain parts of Scotland.
- 2.42. There are some examples of quota being allocated to community groups around the world. In the north east of the United States, for example, groups of fishermen using the same gear in the same area join together, agree to implement management regulations and are then allocated a quota that is then divided between members of the group. Although described as community quotas, the group is more sectorial (comprising like-minded individuals) rather than geographical as such.
- 2.43. There is the question as to how far a community group represents all or part of the existing fishing sector that currently holds the FQAs. An allied issue is how far fish quotas could be allocated to aspirant groups without any fishing track record. The competence of such management groups to allocate and regulate fishing opportunities between individual member vessels would need to be demonstrated in advance. Clearly the allocation of quotas in a post FQA world would be difficult to say the least.
- 2.44. With regard to community fishery initiatives, there are alternatives to the quota system as such. The possibility of TURFs being used to regulate access (see Annex 3) is very much a RBM approach while the alternative of Regulating Orders (such as the Shetland Regulating Order) are much less RBM based.
- 2.45. A logical consequence of Government allocation of fish quotas to different groups based on social and community criteria would be to maintain overcapacity. One of the main advantages of RBM is that overcapacity is taken out of the system by the private sector in order to optimise efficiency and profitability. Without this driver, overcapacity would most likely be maintained in the system.
- 2.46. While this would ensure the employment of large numbers of fishermen (in the short term at least) many of the fishing businesses would be, at best, not as profitable as their European competitors and, at worst, would be loss making. The result could be the preservation of Scotland's traditional fishing communities but at a significant economic cost. Many fishing businesses would probably operate under sub-optimal conditions for a time.

- 2.47. This strategy is unlikely to be successful in the long term without the need for some ongoing subsidy. In this way, a return to a non-rights based management system would not create the circumstances for the fishing industry to thrive economically.
- 2.48. Even if the Scottish Government were inclined to pursue such policies, the recent outcome of the Judicial Review has made it clear that FQAs are regarded as possessions under the European Convention of Human Rights.³ It has therefore been argued that, even though Government has the right to remove such possessions, there could be a strong possibility of multiple compensation claims being made to the European Convention on Human Rights.⁴ The issue of financial compensation claims being pursued through the Courts must therefore be acknowledged as a possibility. In this way the abandonment of the FQA system could prove extremely costly to the Scottish Government.
- 2.49. A somewhat ignored and forgotten aspect of RBM is that the introduction of property rights actually creates wealth through the creation of property rights which rapidly acquire a value. While FQAs lack the indisputable legal title that is granted by an ITQ system, there is no doubt that most fishermen now regard FQAs as tradeable assets. A considerable number of FQA sales take place each year and FQA renting is also now a common feature of the FQA system. An example of the substantial wealth that has been created by the FQA system was the high profile sale of pelagic FQAs from a Scottish company to owners in Northern Ireland for over £80 million in 2012.
- 2.50. In 2010 it was estimated that the UK fish quota had the potential to produce resource rents in the order of £573 million per annum. At a discount rate of 9% the capitalised value of the UK fish quota would be about £6.4 billion.⁵ Whether or not this rather theoretical estimate is accurate or not it is undeniable that the FQAs have, by virtue of becoming something of a de facto ITQ system, created huge value within the industry.
- 2.51. It is, however, possible to make a fairly accurate estimate of the current capital value of Scottish quotas. Taking the 2013 quota allocations derived from Scottish FQAs, and then applying the current price being paid to buy quota, it is estimated that the total current capital value of Scottish fish quota is around £2.5 billion.

³ UK Association of Fish Producer Organizations v Secretary of State for Environment, Food and Rural Affairs, July 2013.

⁴ Briefing Note prepared for Common Seas by Client Earth, July 2013.

⁵ The Potential Benefits of a Wealth-based Approach to Fisheries Management: An Assessment of the Potential Resource Rent from UK Fisheries. A report prepared for DEFRA by IDDRA in 2010.

- 2.52. The important point in this context is that the policy option of abandoning the FQA system would result in the current estimated value of Scotland's quota assets (around £2.5 billion) being lost. A comparison might be a Government policy change that would wipe £2.5 billion of the value of a publically quoted company. There would need to be very compelling and powerful reasons for such a policy change. In our view there are no such compelling reasons for returning to a non-rights based system.
- 2.53. In summary, the abandonment of the FQA system would create a whole range of new problems in terms of quota allocation, would risk compromising the economic viability of the fleet, could be subject to substantial compensation claims in the courts and would wipe upwards of £2.5 billion (at current values) of the value of the Scottish fishing industry.
- 2.54. Notwithstanding all of this, it has been decided to retain the option of abandoning FQAs in order to have a template against which to measure other alternatives.
- 2.55. Having therefore discounted both the ITQ and FQA abandonment options as viable policy options, is it possible to reform the FQA system in order to promote greater economic efficiency while at the same time maintaining fishing communities? The next section examines this option.

Reform of the FQA system

- 2.56. Notwithstanding the many criticisms of the FQA system, it has actually served the Scottish fishing industry well since it was introduced in 1999. The early devolution of fisheries management responsibilities to POs in 1984, and the subsequent introduction of FQAs in 1999, has created a rather unique fisheries management system. There is currently a dynamic market place for the trading of FQAs under the overall regulation and supervision of POs.
- 2.57. In many ways the introduction of the FQA system has been largely industry led with Fisheries Departments responding to proposals made by the industry. It has not been the case that quota trading has in any way been forced on an unwilling industry. The current FQA system has to some considerable extent been shaped by the fishing industry working together with Government over the past two and a half decades.
- 2.58. It would therefore seem reasonable to conclude that the FQA system is operating with some degree of efficiency and broadly commands the support of most fishermen. As already noted, while the existing FQA system is clearly not an ITQ system as such, there is now a substantial element of quota trading (buying, selling and leasing) taking place.

- 2.59. The role of POs is crucial here. It is not possible for an individual or company to buy, sell or rent quota units unless in membership of a PO. Once in membership of a PO, an individual fisherman, vessel owner or company can however buy, sell and lease quota units.
- 2.60. The administrative system of legal agreements (which remove FQAs from licences until formally reconciled at a later date), regular reconciliation exercises and domestic swaps between POs all enable quota trading to take place fairly easily. Although there is no legal title to a property right, this has not prevented fishing vessel owners and other quota holders making very considerable investments in an administrative system that confers the advantages of an ITQ system by another name.
- 2.61. While there may be an interesting academic debate as to how far the current FQA system fits the RBM model, in reality quota trading is now recognised as an essential and important component of the modern Scottish fishing industry.
- 2.62. At the same time, notwithstanding the considerable rationalisation and consolidation that has taken place, the Scottish fishing industry remains located in a large number of fishing communities throughout Scotland. The FQA system has not resulted in social dislocation and the disappearance of the fishing industry from around the Scottish coast.
- 2.63. Although the commercial fishing industry has indeed disappeared from a few communities, in most cases this has not happened and fishing continues to be an important activity, albeit in a very different form and structure to that which existed in the past. It is, however, the case that much of the fishing activity which still takes place around the Scottish coast is either based on the 10mu sector or that part of the Scottish fleet which fishes non-quota species.
- 2.64. It is undeniable, however, that pelagic and white fish FQAs are now held in fewer hands and in fewer fishing communities than before. While the holdings of pelagic quotas have been concentrated for some considerable time, the holding of white fish quotas has become more concentrated since 1999.
- 2.65. In 1999 when FQAs were introduced, pelagic quotas were already held by a limited number of owners in a limited number of fishing communities. The current situation continues to reflect that. With regard to the white fish sector, the concentration of white fish quota into fewer hands and fewer places is, however, probably as much a consequence of the dramatic reduction in white fish quotas since 1999 rather than a result of the FQA system as such.

- 2.66. In the decade after FQAs were introduced in 1999, the quotas of most staple white fish species were reduced considerably. The decline in cod and haddock were particularly marked. By 2009 the UK haddock quota had fallen to only 26,687 tons - only 46.8% of its level in 1999. The situation regarding cod was even more dramatic with the UK quota having fallen to only 11,217 tons in 2009 – only 19.9% of its level ten years previously. While now improving, most white fish quotas are still well below 1999 levels.
- 2.67. With substantial reductions in white fish quotas since 1999, the fleet would have contracted in size regardless of the management system in place. To that extent it is somewhat misleading to explain the contraction in fleet size, and associated concentration in quota holdings, as simply a consequence of the FQA system.
- 2.68. The FQA system has enabled the economic advantages of quota trading to take place while at the same time managing to preserve the basic community structure of the Scottish fishing industry. To that extent, the FQA system has been a success in terms of delivering both economic efficiency and maintaining fishing communities.
- 2.69. It would therefore seem prudent not to abandon nor radically change the system. Instead, it is more appropriate to examine the option of how the FQA system might be modified in order to promote greater economic efficiency while maintaining fishing communities.
- 2.70. This is examined within the context of three subsections, dealing in turn with the questions of economic efficiency the issue of maintaining fishing communities followed by a general section dealing with other aspects of the FQA system.

Promote greater economic efficiency

- 2.71. There are a number of possible changes to FQAs that would promote greater economic efficiency, by further embedding the rights based nature of the allocation system, without actually progressing to a full ITQ system as such.

Remove the link between the licence and the FQA and record real time FQA transfers.

- 2.72. There is a strong case to abandon the condition that FQAs must be tied to licences.
- 2.73. In 1999 it was agreed that FQAs should be linked to active vessel licences in order to prevent the development of a market in FQAs. At best this was a naive hope; at worst it was muddled thinking. Before long, an active trade in FQAs had developed. While quota units must continue to be attached to

vessel licences (insofar as all four Fisheries Administrations are concerned), this bureaucratic restriction is overcome by the buyers and sellers signing a legal agreement which commits both parties and their respective POs to transferring the quota units concerned.

- 2.74. As far as the industry is concerned, quota units can now be readily traded by utilizing these legal agreements that have become standard. In those cases where the sellers and buyers belong to different POs, an annual quota swap is required in order to give effect to legal agreement and actually transfer the quota units purchased.
- 2.75. Fisheries Departments still maintain the link between FQAs and active licences but have recognized the reality of quota trading insofar as they undertake regular reconciliation exercises so that quota units can be attributed to new licence holders (the buyer of quota units) rather than the original licence holder (the seller of quota units). This removes the need for quota swaps, underpinned by legal agreements, to continue indefinitely. The last reconciliation exercise took place in 2010.
- 2.76. Since these reconciliation exercises in effect confirm the transfer of quota units (which have been sold) between licences there is a powerful argument that there should be real time transfers of quota units between licences whenever quota units are purchased. To some extent the need for legal agreements, the consequent quota swaps and the delay before a reconciliation exercise confirms that the quota sale has indeed taken place are the last remaining bureaucratic restrictions within a system that has otherwise allowed a fairly sophisticated quota trading market to develop.
- 2.77. If it is accepted that FQAs are traded between licence holders is there then any need to link FQAs to licences at all? Since this linkage was initially an attempt to prevent quota trading, the rationale for the linkage has now disappeared. FQAs are currently a tradeable commodity and the FQA system should not maintain complicated rules that were originally intended to limit quota trading but which are now clearly ineffective and pointless.

Public Record of FQA Holders

- 2.78. On 19 December 2013, The Fixed Quota Allocation Register (<https://www.fqaregister.service.gov.uk>) was launched by all four Fisheries Departments. This is a very user-friendly database that shows to which licence or dummy vessel (see 3.1.4) the 8 million plus FQA's in circulation across the UK are attached. However, this only shows the licences to which FQA's are attached. In those cases where quota units have been bought or sold (and the transfer of FQAs secured through the standard legal agreement), these transactions are not be reflected in the record of FQA holders until such time as a future reconciliation exercise takes place.

- 2.79. In other words, commendable as the public record of FQA holders is in terms of transparency, it only goes so far. It only shows which licence the FQAs are attached to and not the current owner of the FQAs if a recent quota trade has taken place.
- 2.80. The public record of FQA holders should show who actually holds the FQAs, not which licence the FQA is attached to. This can only be done if real time quota transfers are recorded.

An Online Trading Platform

- 2.81. The market in FQAs will operate most efficiently if it is truly comparative and transparent. If the link between the FQA holder and the licence is broken and real time FQA transfers are publically recorded, then there would be an opportunity for an online trading platform to be set up. This would ensure complete transparency in quota trading – all buyers, sellers, lessors and leasees would be identified, as would the prices paid to buy and lease FQAs.
- 2.82. At the present time the market in FQAs is shrouded in some mystery. The link between FQA holder and licence prevents transparency, the role of POs in making swaps adds to the confusion (only the PO executives, as a rule, know the reasons behind the annual swaps) and there is no public knowledge of prices paid. In other words, the current FQA market is not efficient, competitive or transparent.
- 2.83. This probably inflates the prices paid to buy and lease FQAs. Indeed, it is envisaged that the establishment of an online trading platform of this nature will apply a welcome downward pressure on lease prices.
- 2.84. The establishment of an online trading platform, or at the very least, an online public record of FQA sales and prices, would therefore greatly improve the operation of the FQA market. It would make sense to add the public record of FQA sales and prices on to the public record of who the FQA holders are (as proposed below). An online trading platform, on the other hand, is probably best established by the private sector – an FQA e-bay perhaps?

Remove Dummy Licences

- 2.85. In order to enable certain holders of FQAs who do not hold an active licence to operate within the FQA system, POs are allowed to have up to two dummy licences in membership. These dummy licences are the mechanism for POs to hold their own FQAs (as in the case of the community held quotas held by some POs), for fish selling companies to hold quota for vessels operating through their offices and for individuals who own FQAs but not a licence.

- 2.86. If the link between the licence and FQAs was to be removed, with all quota trading documented in real time and all FQA holders recorded on a public register, then the need for having the somewhat artificial construct of dummy licences is removed.

Fully integrate the 10mu sector into the FQA system

- 2.87. The principal exception to the FQA system is the allocation of a pool of quota to vessels in the 10mu sector, which is managed by Government on the basis of monthly quotas. The Scottish 10mu sector is not as large (in relation to the over 10 metre fleet) as it is in England. Moreover, within Scotland the 10mu sector principally fishes for non-quota shellfish species.
- 2.88. With regard to quota species, the fishery of most importance to the 10mu fleet is nephrops.
- 2.89. There is also a relatively important 10mu sector fishery for Western mackerel (around 300 vessels catching between 400 and 500 tons per annum) and, to a much lesser extent cod.
- 2.90. The 10mu sector is often a starting point for young fishermen acquiring their first vessel. Vessels operating in this sector are, however, denied the benefits of the FQA system in terms of quota trading because individual track records were never attributed this sector and they continued to fish out of the so called 10mu pool.
- 2.91. There may have been at one time good reasons to create a 10mu pool outwith the FQA system but it is increasingly seen as rather arbitrary and unfair that vessels of 10 metres and under are denied the undoubted advantages of quota trading that are available to all vessels over 10 metres. The integration of the 10mu fleet into the FQA system would probably result in some consolidation of that part of the fleet, although the most likely outcome will be the improved profitability of this sector.
- 2.92. It is therefore suggested that all vessels in the 10mu sector should be allocated an FQA based on their individual track record, which would be calculated from the most recent three representative years' fishing. All those vessels in the 10mu sector would then be given the opportunity to join the FQA system and become full members of POs. This would not be obligatory but would be an option open to all 10mu vessels.
- 2.93. Some of the proposals made under the following section (Maintain Fishing Communities) would provide additional quota to the 10mu sector (thereby improving their individual FQA allocations) and so encouraging as many as possible to opt into the FQA system. Indeed, the option of an additional allocation to the 10mu sector (as outlined below) could be used as a policy tool to encourage the integration of this sector into the FQA system. This

could be achieved by allocating a share of the additional quota only to those 10mu vessels prepared to fully integrate into the FQA system.

- 2.94. The possibility of encouraging integration of the 10mu sector into the FQA system by means of additional FQAs is feasible within Scotland given the relative small size of the 10mu sector in relation to the FQA sector as a whole. This is probably not the case in England where the 10mu sector is comparatively large in relation to the FQA sector as a whole. By integrating the 10mu sector into the FQA system, a large number of fishermen, in a large number of small fishing communities, would become FQA holders thereby reversing the trend towards FQAs being concentrated into fewer hands and fewer ports.
- 2.95. The possibility of integrating the 10mu fleet into the FQA system has already been considered in England⁶. It was not however possible to achieve consensus on such a proposal, mainly as a result of size of the 10mu sector in England allied to the fact that most had very poor track record fishing performances. In Scotland, such a proposal is much more likely to command wide support given that the 10mu fleet is much smaller and given the various options for providing additional fish to the 10mu sector as outlined earlier.

Maintain Fishing Communities

- 2.96. There are a number of possible changes that would ensure that the improved efficiency of the FQA system outlined above does not take place at the expense of community cohesion and the maintenance of fishing communities. Indeed, these changes go even further in that they would, if implemented, result in a substantial increase the number of FQA holders.

Changing FQA allocations when sold

- 2.97. One of the main arguments against the FQA system is that those individuals who had the good fortune to have been fishermen when the FQA system was introduced in 1999 were given valuable assets for free. Even though there is no legal title, it is clear that substantial sums have been paid for FQAs since this time. Many fishermen have subsequently invested heavily in acquiring additional quota, but the fact remains that what is regarded as a public resource has provided substantial private profit for those who have sold their FQAs and a potential substantial private profit for those fishermen yet to sell their FQAs.
- 2.98. In order to address this issue it is suggested that the Scottish Government retain a small share of a FQA whenever it is sold. In this way it can be argued that society at large is recouping some small share of the FQA value. This share (possibly around 5% of the FQA) could then be used by the Scottish Government for a variety of purposes including topping up the quota

⁶ Reform of Fisheries Management Arrangements in England –Defra Impact Assessment Paper 1338, 2011.

allocation made available to the 10mu sector and/or a scheme to help new entrants acquire FQAs – something that might be coordinated by the various POs.

- 2.99. Some POs have already purchased FQAs and have used the resulting quota allocations to create community quota pools. These could be used as a repository for quota for new entrants to the industry who do not yet have the financial resources to buy their own FQA share. It is understood that the Shetland PO operated such a new entrants' scheme in the late 1990s and is currently investigating how this can best be re-established.
- 2.100. This option would provide additional quota for reallocation which would be taken from those electing to sell their assets and leave the industry. In many ways this is a more rational option than "top slicing" an entire sector (an alternative option which is fully outlined below), which in effect means taking fish from all those fishermen who are continuing to fish and can therefore be seen as impinging on the economic opportunity of all those who have elected to remain in the industry and not sell their FQAs.
- 2.101. By making an additional allocation in this targeted way, all additional fish comes from those who are making private profit out of what is regarded as a public resource. In some ways such a policy can be regarded as a non-financial tax on those who sell the assets which were awarded to them for free.

FQAs can only be sold as segments

- 2.102. One of the great fears is that the operation of the FQA system will inevitably result in fewer and fewer individuals and companies holding more and more FQAs. As already noted, this has been the case for some time in respect of pelagic quotas and is now happening in the white fish sector. The process has also occurred to some extent in the nephrops fleet although quota pressures have been much less in this sector.
- 2.103. The excessive concentration of FQAs in the hand of a few is seen as socially divisive within many fishing communities.
- 2.104. It is also seen as somewhat risky in that these large quota allocations may at some stage be sold on to non-Scottish companies. As already noted, this danger was recently highlighted by the sale of Scottish pelagic FQAs to a fishing company in Northern Ireland.
- 2.105. It is increasingly the case that young fishermen cannot aspire to become holders of FQAs in their own right. This reflects the fact that FQAs are now very valuable commodities. It also reflects the fact that FQAs are generally sold as a single unit, the total value of which is beyond the means of most young fishermen. Established fishery groupings or companies generally

purchase these FQAs, thereby further exacerbating the problem of excessive concentration of FQA holdings.

- 2.106. The Scottish Government cannot artificially reduce the market price of FQAs but it can determine how an FQA is sold. If, for example, an FQA were to be split into 10 or 20 segments of equal size, with no individual or grouping able to buy more than one or two segments, the price of FQA segments could be within the reach of younger fishermen aspiring to acquire FQAs in order to establish their own fishing business. The limitation on how many segments an individual or grouping can buy is arbitrary and could be set at any level but the point of such a limitation is to prevent whole FQAs being bought by the larger operators – as is the case currently.
- 2.107. If the link between the licence and the FQA were then broken, many fishermen would be able to become holders of small FQAs segments. If the 10mu sector were then integrated within the FQA system, many small vessel owners could aspire to move from the 10mu sector to full membership of a PO by acquiring an additional small FQA segment. Other fishermen, already employed as crew on board larger pelagic and demersal vessels, would be able to rent out their FQA segment until such time as they could aspire, probably in partnership with other FQA segment holders, to accumulate sufficient FQAs in order to acquire and operate their own vessel.
- 2.108. A system very similar to this operates in the US Pacific halibut fishery. All halibut quotas have to be sold as small discrete segments, thereby enabling a new generation of quota holders to emerge. Excessive concentration of ownership of halibut quota has consequently been avoided.
- 2.109. The vision behind this particular option is to widen the number of individuals who can become holders of FQAs and thereby prevent the inexorable process of concentration of FQAs in the hands of a small number of holders. Such a scheme could also reinvigorate the fishing industry as a new generation of fishermen could aspire to become holders of FQAs. In other words, the ownership of fish quota would be dispersed rather than concentrated. In the same way as integrating the 10mu sector into the FQA system would reverse the trend towards FQAs being concentrated into fewer hands and ports, so would the segmentation of FQAs encourage a new generation of young fishermen to climb onto the FQA ladder.

Increase allocations to assist the 10mu fleet

- 2.110. A consultation is currently underway by Marine Scotland that proposes that around 1,000 tons of Western mackerel be taken from the Western mackerel sectorial quota and given to the 10mu sector in order to improve

the fishing possibilities for these small vessels. The same principle of re-allocation could be applied to other stocks such as nephrops and cod.

- 2.111. As already noted, this particular method takes a little from all vessels whereas the proposal to reallocate a portion of FQAs when sold only takes FQAs from those choosing to sell.
- 2.112. It has been argued that the 10mu sector, which is, to all intents and purposes, a group of vessels outwith the FQA system dependent upon management decisions made by Government, functions well and that a transfer of additional quota from the FQA sector would further improve the operation of this sector. There is no evidence that would support such a contention.
- 2.113. Fishermen operating in the 10mu sector are unable to plan their annual fishing activity. Every month Government makes the decision as to how much each vessel in the 10mu sector is allowed to catch. This does not lead to economic efficiency.
- 2.114. By planning their annual fishing pattern, fishermen can land fish when prices are best, can take holidays and arrange vessel repairs and maintenance without losing quota and can generally manage their businesses. The conclusions from the Ramsgate quota pooling trial confirm that this group of 10mu vessels in England have indeed enjoyed all these benefits. They can also better align quota to fishing operations by buying, selling or leasing FQAs. Management of the 10mu sector by Government, outwith the FQA sector, does not enable any of these rational business decisions to take place.
- 2.115. The 10mu fleet is now the mainstay of most of Scotland's small fishing villages. The objective of maintaining this fleet of small vessels underpins many of the arguments for improving the prospects for the 10mu fleet by providing additional quota from the FQA sector.
- 2.116. Providing additional quota to the 10mu sector, without improving the management arrangements of this sector, however, is neither rational nor efficient. The economic efficiency of the 10mu sector would be improved by affording these small vessels all the same advantages as those operating in the FQA sector. Integrating the 10mu vessels into the FQA sector would improve the profitability of this sector and thereby enhance the long-term social and economic contribution of this fleet to many small fishing communities.
- 2.117. Transferring quota from the FQA sector could be the means to assist integration of this very important 10mu fleet into the sector. In this way an additional FQA allocation is perhaps best viewed as a possible policy tool

to encourage integration of the 10mu fleet into the FQA sector rather than a stand-alone policy option. To simply allocate additional quota to the 10mu fleet without addressing the inefficiencies of the current management arrangements for this sector is a wasted opportunity.

- 2.118. The whole issue of moving quota from the FQA sector to the 10mu sector will always be controversial, as it will be seen by many as robbing Peter to pay Paul. It clearly makes no sense to create a problem in one sector to help out another sector. This can only be rational when the sector that gives up quota can afford to lose quota. This is currently the case in respect of the mackerel fishery (although it may not always be the case) but is clearly not currently the case in respect of many white fish fisheries. One option for providing additional white fish quota might be to identify an agreed proportion of any future quota increase as being reserved for an additional allocation to 10mu vessels. In this way Peter is not robbed – instead Peter just gets slightly less of an increase.
- 2.119. As already noted the robbing Peter to pay Paul problem can also be avoided if the additional quota is taken from FQAs when they are sold as opposed to transferring quota from the FQA sector as a whole.
- 2.120. There is a danger that there may be a regular call for quota transfer in order to subsidise the many inefficiencies of the current management arrangements for the 10mu sector. As suggested the alternative is to use the opportunity of a one off quota reallocation to secure the integration of the 10mu fleet into the FQA sector.

Concentration Caps on FQA holdings

- 2.121. Following on from the concerns about excessive concentration of FQAs in the hands of a few individuals or companies, another very simple method of limiting this would be to introduce a cap on what percentage of FQAs any individual or company could hold in their own right or through associated businesses. Such caps have been introduced in Iceland for example where no company can own more than 15% of the cod quota. In contrast, no such caps have been introduced in New Zealand with the result that only three large companies now own most of the ground fish quota.
- 2.122. The concentration of quota ownership has already progressed further in the pelagic sector than any other sector. The largest fishing company in Scotland, the Lunar Group, already holds 18.7% of the Scottish mackerel quota, 19.1% of the Scottish North Sea herring quota and 16.5% of the Scottish West of Scotland herring quota. The Klondyke fishing company holds almost the same share of the Scottish mackerel and North Sea herring quota and slightly more of the Scottish West of Scotland herring quota.

- 2.123. One option may be therefore to consider imposing a limit of, say, 20% or 25% on how much Scottish pelagic quota can be held by a single business.
- 2.124. FQA holdings are not yet so concentrated with regard to demersal stocks. However, even here the Lunar Group already holds around 5% of the Scottish quota of North Sea cod, whiting and saithe and almost 8% of the Scottish quota of North Sea haddock. It may therefore be appropriate to consider imposing a limit of, say, 10% on how much Scottish demersal quota may be held by a single business.
- 2.125. It has only been possible to ascertain what proportion of quotas are held by the Lunar and Klondyke companies because these two companies operate single company POs and their quota allocations are therefore readily available from the weekly quota uptake sheets issued by Marine Scotland. Neither company is involved in catching nephrops.
- 2.126. With the publication of the FQA register (updated to reflect real time ownership of licences) it will be possible for public scrutiny of what proportions of quotas are held by which companies/individuals.
- 2.127. The quotas of those companies specializing in fishing for nephrops are contained within the various overall PO quota allocations. No suggestion can therefore be made at the moment on a possible limit on how much Scottish nephrops quota could be held by a single business.
- 2.128. It is understood that the Scottish Government has looked at this possibility before and a number of problems were identified including that of how to define a quota holder. The possibility of several companies or operations being set up under a common holding company was one potential problem that was highlighted. Notwithstanding this, it would be a very important message to send out to the industry that concentration of FQA holdings will not be allowed to continue and an upper limit will eventually be set.

Other issues

- 2.129. This section examines four issues related to the ongoing operation of the FQA system. These are in turn the problem of leasing costs, the possibility of changing track reference periods, the future role of POs and the possible impact of the discard ban on the future of the FQA system.

Leasing Costs

- 2.130. A shortage of quota means that many fishermen have to rent quota at high cost. It has been pointed out that this is an operating cost that was unknown prior to the introduction of FQAs. In some ways this is the downside to the capital value that is created by RBM systems. These new operating costs are leading, some argue, to a new class of tenant fishermen.

- 2.131. This is in contrast to the traditional structure of the Scottish fishing industry that, apart from the trawling ports of Aberdeen, Granton and Dundee, was always characterised by fishermen who were also vessel owners. Although the ownership of quota is a new concept, many would argue that a fisherman being both a vessel owner and a quota owner is very much in keeping with the tradition, culture and social mores of Scottish fishing communities.
- 2.132. Are leasing costs an inevitable consequence of a RBM system such as FQAs? Is it possible to reduce leasing costs by public policy intervention or are leasing costs a normal and indeed welcome consequence of a competitive and transparent free market?
- 2.133. There are some references to the issue of leasing costs in relation to the halibut and black cod fishery in British Columbia in the literature.⁷ While leasing costs are probably always unpopular amongst those who lease, this particular academic disagreement over lease costs appears to be somewhat of proxy for a more fundamental philosophical disagreement between those who believe in RBM and those who do not.
- 2.134. Turning to the situation in Scotland, it has been argued that leasing costs are higher than they might otherwise be because of the holding of FQAs by two groups of non active fishermen - the so called “slipper skippers” and corporate entities such as fish selling companies.
- 2.135. This is a somewhat confused argument. The main complaint appears to be that the individuals/fish selling companies who are leasing out FQAs are not active fishermen. Why should this be an issue? The cost of leasing quota will be dictated by the normal market forces of supply and demand and should be no different whether or not the lessor is an active fisherman or not.
- 2.136. The issue of slipper skippers is particularly emotive. There is a view that because slipper skippers no longer go to sea (although most used to be active fishermen) they no longer have a right to be quota holders. Many in the industry have called for the holding of FQAs by slipper skippers to be banned.
- 2.137. Many would argue that leasing and renting are essential and desirable features of all markets. In the property market, for example, some people

⁷ Pinkerton and Edwards - The elephant in the room: The hidden costs of leasing individual transferable fishing quotas in Marine Policy 33 (2009).

Turris - A rejoinder Pinkerton et al. The elephant in the room: The hidden costs of leasing individual transferable fishing quotas in Marine Policy 34 (2010).

Pinkerton and Edwards - Ignoring market failure in quota leasing? In Marine Policy 34 (2010).

buy while others lease. Some move from leasing to buying while others prefer to continue to lease. The market for FQAs is no different. Indeed the market for leasing quota provides valuable flexibility in fisheries management by allowing individuals to acquire additional quota when it is needed and lease out surplus quota when it is not needed.

- 2.138. Renting can therefore be regarded as a positive feature of the FQA system and should be retained. The suggestion that a particular group of individuals be debarred from holding and renting FQAs because they are no longer active fishermen is not persuasive. The banning of slipper skippers will not result in any reduction in the rental price of quota. Indeed, banning these individuals from holding FQAs may very well exacerbate the trend towards FQAs becoming owned by a smaller and smaller group of individuals who are active fishermen.
- 2.139. The issue of leasing costs is, however, wider than just the question of slipper skippers. The largest holders of FQAs, outwith active vessel owners, are the fish selling companies. Several of these companies have acquired FQA pools in order to further their business interests as agents for fishing vessels. In some cases these FQAs are used as repositories for quota that will eventually be purchased by fishermen working through their office. In other cases these FQAs are used as a pool of quota that is leased to vessels, again operating through their offices.
- 2.140. It is argued that these sales offices are driving lease prices up. This may indeed be the case but, if it is, then it is an argument against FQAs being held by a small number of players. It is not an argument to reduce the number of players who can hold FQAs by limiting this to active fishermen.
- 2.141. In many fisheries around the world there have been restrictions introduced which limit quota holding to active fishermen. In most of these cases this reflects deeply held social and cultural values that only active fishermen should hold quota. Many within the Scottish fishing industry probably share similar views.
- 2.142. To translate these social and cultural attitudes into public policy is not straightforward, however. How to define an active fisherman, for example? Does he/she need to be on board the vessel at all times and, if so, how to prove this? With the shift patterns most fishermen now work, few fishermen are now at sea at all times.
- 2.143. What time at sea would then be required - months or weeks? What about illness that may keep some otherwise active fishermen ashore? Is it enough to be a vessel owner as distinct from a full time crew member? If so, what about vessels that are owned, and quotas that are held, by companies as opposed to individuals?

- 2.144. What about the sons and daughters of fishermen – can they inherit FQAs? Could this FQA inheritance continue for several generations or could it be limited in some way? It is clear that a definition of what constitutes an active fisherman is not easy and raises some very difficult issues.
- 2.145. The Scottish Government will have to take a view as to whether or not it restricts the holding of FQAs to active fishermen on the basis of social and cultural values. That is a political decision it must take. It is however important to emphasise that there is no evidence that such a decision would lead to a reduction in the cost of leasing.
- 2.146. It has been argued that if more quota was held by the active fleet there would be a reduced demand for leasing and hence lower lease prices. There is no doubt that lease costs are a function of supply and demand and, to that extent, the more quota available, the lower the cost of leasing will be. However, the cost of leasing is also related to the fact that the more fish quota a fisherman can catch the greater his profit. In this way, even if quota availability increases, lease costs may not necessarily reduce.
- 2.147. For example, it will be interesting to see if the cost of leasing pelagic quota is reduced as a result of the expected increase in mackerel quota in 2014. The fact of the matter is that active fishermen are as capable of driving up lease costs as other players. In short, the argument that limiting the holding of FQAs to active fisherman (however defined) will somehow reduce lease costs is not persuasive.
- 2.148. The kernel of the issue here are lease costs and not who is doing the leasing. If the trading of FQAs were made more open and transparent (as outlined below) then it is expected that lease costs would reduce.
- 2.149. In summary, as with all other markets, the larger the number of players the more competitive the leasing market should be. If holding FQAs is restricted to a limited group – such as active fishermen (however defined) - the easier it will be to “rig” the market and form cartels. It is therefore argued that the best means of reducing the lease price is to maximise the number of FQA holders (as proposed below, for example) and to accept that this may include non-active fishermen and corporate bodies such as fish selling agents. In other words to focus on policy options which encourage greater numbers of fishermen to become FQA holders rather than focusing with the very difficult and complex issue of prohibiting certain groups of society from holding FQAs.

Changing the FQA reference period

- 2.150. It has been suggested that a re-basing of allocations to take account of catches in a more recent reference period would result in a larger percentage of quotas being made available to vessel licensees, thus

reducing the amount of quota that those vessels might have to source in in-year trading. A certain sector of the fleet regularly has to lease quota every year in order to augment their fishing opportunities.

- 2.151. By recalculating FQAs based on a more recent reference period, these vessels would all receive increased FQAs (based on actual catches) thereby eliminating or reducing their need to lease quotas. These increased FQA units would of course be effectively taken from those FQA holders who did not catch their allocations during this new reference period, choosing instead (for whatever reason) to lease their quotas. In other words there would be winners and losers if the FQA reference period were to be changed.
- 2.152. The main problem with this option is not surprisingly, the losers. Many FQA holders, who for whatever reason do not fish their allocations, would lose out in such a recalculation of FQA entitlement. The losers will be a large and diverse group. Not only will it include the corporate entities (such as the fish selling companies) that hold, but do not fish, FQAs but it will also include many active fishermen who have bought, in good faith, additional FQAs but may not have been able to fish their entitlement during the new reference period.
- 2.153. The fact is that a considerable proportion of FQAs have been used for renting - by individuals waiting to get a new boat built, by fish selling offices providing additional fish to boats operating through their offices, by POs operating community quota pools and by individuals who have developed a business based on renting quota allocations. If the FQA reference period were changed then all of these FQA allocations would be lost, as the vessels that rented the FQAs would have caught the fish and thereby have acquired the track record.
- 2.154. This particular group of losers would be able to argue with some considerable degree of justification that they had invested in additional FQAs in order to improve their economic viability and that the Scottish Government was taking away the result of this investment and giving it to a group of fishermen who had refused to buy FQAs. The losers would also include the community quotas that some POs have built up.
- 2.155. Some POs purchased these FQAs in order to create a pool of community held quota. As already noted these quota pools are now being used for innovative new entrant schemes in some cases. In the event of FQAs being re-based on a revised reference period, these unique pools of community quota would be lost.

- 2.156. As already noted, the outcome of the recent Judicial Review has confirmed that FQAs are possessions that cannot simply be taken away without at least the possibility of a legal claim for compensation.⁸ There could therefore be a huge demand for financial compensation from all those losers who could demonstrate that they had lost FQAs as a result of a change to the reference period.
- 2.157. Another drawback of such a change is that it would result in FQA holders being unwilling to lease quota as the expectation would be that a further change to the reference period might result in a loss of FQAs if the fish were not caught. FQA holders then make sub optimal decisions to catch their FQAs in order to preserve future rights instead of economically rational decisions to lease quota. In this way the only way a fisherman could augment his catching opportunity would be to buy FQAs – something that not all can afford to do.
- 2.158. The option of changing the FQA reference period would also create huge uncertainty and would substantially remove the RBM benefits of the current FQA system. Instead of FQAs being tradeable fishing rights, FQAs would simply be a reflection of recent fishing history to secure future fishing opportunity. The catching of quota would become a means of ensuring future FQA allocations as opposed to an economically rational decision in itself. This would run the real risk of diluting the very considerable capital value of Scottish fish quotas – estimated at upwards of £2.5 billion.
- 2.159. Others have suggested that a rolling reference period, instead of a more recent reference period, should be introduced. This would simply confirm the expectation that future FQA entitlement would depend on maintaining current catches regardless of economic logic. As already noted, such a change would remove the RBM benefits of the FQA system and would forever link future FQA allocations to recent fishing history. A rolling reference period actually existed immediately prior to the fixing of the current three year track record period (of 1994 to 1996) in 1997. One of the main reasons for fixing the track record period was that ghost fishing (the recording of fish landed that were not actually caught) was becoming widespread.
- 2.160. A rolling reference period would almost certainly increase leasing costs as the decision to lease, as opposed to catching, quota would inevitably result in a reduced track record and thereby a permanent reduction in FQAs. Indeed, the spectre of permanently losing FQAs would probably result in the end of the FQA leasing market as such.

⁸ UK Association of Fish Producer Organizations v Secretary of State for Environment, Food and Rural Affairs, July 2013.

- 2.161. The fact that current FQAs are based on a reference period of almost 20 years ago should not, however, be seen as a problem but as a reflection of how well the FQA system has worked. The quota trading (purchase and leasing) which has taken place since 1999, as a result of the opportunities afforded by the FQA system, has enabled the Scottish fleet, together with the benefit of publically funded decommissioning schemes, to consolidate and adjust to changed circumstances.
- 2.162. It is estimated that between £200 and £300 million was spent on quota purchases within the UK up to 2007. It would be a conservative estimate that at least the same, if not more, quota has been bought in the last six years. Another indicator of how prevalent quota purchase has become is the fact that there are around 1,500 quota swaps between POs within the UK each year, the majority of which are consequent upon giving effect to the legal agreements to transfer FQAs between licences following a quota purchase.⁹
- 2.163. While further analysis would be required to update these figures, and to determine the separate Scottish element, there is no question that quota purchases have continued apace since 2007. There are probably few vessels now operating in the Scottish fleet that are fishing the original FQA allocation attributed to their licence. Most FQAs have been augmented through the process of quota trading. This is the great strength of the FQA system and having real time recording of the sale of FQAs (as already suggested) would further enhance it.
- 2.164. The reference period of 1994-96 was simply an arbitrary starting point. Some 14 years of quota trading have now taken place since the FQA system was introduced in 1999. During that time the original FQAs have been very significantly changed as a result of this trading.
- 2.165. In summary it is believed that changing the FQA reference period would be an unnecessary complication that could very expensive for the Scottish Government. The greatest drawback would, however, be that it would change the FQA system from RBM model to an allocation model – thereby losing all the economic advantages which such RBM systems confer.

Maintain and enhance the central role of POs in managing the FQA system.

- 2.166. As already noted POs are central to the operation of the FQA system. Indeed, over the past twenty years, the principal role of POs has changed from operating the EU Marketing Regulation to that of quota manager. In this role POs ensure the optimum operation of the FQA system with quota

⁹ The Potential Benefits of a Wealth-based Approach to Fisheries Management: An Assessment of the Potential Resource Rent from UK Fisheries. A report prepared for DEFRA by IDDRA in 2010.

swaps to ensure maximum uptake of the Scottish quota, enabling individual vessel uptakes to be maximised and generally undertaking much of the detailed quota management responsibilities that would otherwise have to be undertaken by Marine Scotland.

- 2.167. All POs operate dummy licences in order to facilitate ownership of FQAs that are not linked to a licence. In some cases POs operate very successful community quota schemes. It is understood that the Shetland PO is currently trialling a scheme whereby some of its community quota will again be used to help new entrants get a start into the white fish sector.
- 2.168. Another advantage of POs is that each PO has adopted different quota management strategies depending on the needs and wishes of its membership. While most POs allocate individual annual quotas to vessels based on their individual FQAs, others continue to operate a pooled quota system whereby the FQAs of white fish and nephrops are pooled together then allocated to all vessels on a monthly basis. Others operate an amalgam of individual and pooled quotas.
- 2.169. POs are the ideal quota management bodies in that they are organisations that represent vessel owners – the individuals who are at the centre of the FQA system. They are also, to a large extent, regionally based organisations and therefore reflect the regional as well as the sectorial diversity of the modern Scottish fishing fleet.
- 2.170. The success of the POs in becoming quota managers lies in the fact that each PO has the autonomy to determine its own fisheries management policy. For example, the detailed quota management arrangements adopted by the West of Scotland PO will be quite different from the Fife PO and different again in Shetland. This diversity and regional/sectorial autonomy is a source of great strength for the successful delivery of the FQA system and should be maintained.
- 2.171. In the event of the Scottish Government changing the FQA system on the basis of some or all of the suggestions made in this report, the role of POs will become even more important. They will be essential in helping manage the integration of the 10mu sector into the FQA system, developing community quota schemes, implementing new entrant programmes and enabling individuals holding small FQA segments to hold these within the PO structure. It is therefore essential that the Scottish POs remain fully engaged with Marine Scotland in discussing possible future changes to the FQA system.
- 2.172. In summary the Scottish PO structure is already fundamental to the successful operation of the FQA system and will become even more

important should some or all of the proposals made for reforming the FQA system be adopted by Scottish Government.

Impact of the discard ban on the FQA system

- 2.173. The introduction of the landing obligation (or the discard ban as it is known) will take effect in 2016 for most species. Depending on exactly how the discard ban is managed, there could be very significant implications for the FQA system.
- 2.174. The landing of species, which would otherwise have been discarded, will cause serious problems for quota management in those cases where there is no quota allocation for those species. How can it be possible for a vessel to legally land a species for which it has no FQA allocation? Clearly the detailed rules, which are introduced to manage the landing obligation, could have profound implications for the management of the FQA system.
- 2.175. It is understood that discussions on the implementation of the landing obligation between Fisheries Administrations and the fishing industry are at an early stage. Until there is greater clarity on how the landing obligation is going to be introduced and administered there is little more that the consultants can add at this time.

Status Quo

- 2.176. The option of retaining the status quo and continuing to operate the existing FQA system as is should not be dismissed. The system has operated since 1999 and is fully understood by the fishing industry. It has had to operate under conditions of real stress, particularly in the white fish sector in recent years with all the problems of severe TAC reductions and the cod recovery programme. The fact that the FQA system has remained the vehicle for delivering Scottish fisheries management during such very difficult times has shown that the system is robust. To that extent it has therefore been a success.
- 2.177. There are of course many criticisms and many critics. On the one hand the FQA system could be modified to ensure that it delivers greater economic efficiency and vessel profitability. On the other hand, the system could be changed to deliver greater benefits to those who believe the FQA system has not worked for them. These and other reforms to the FQA system are of course fully discussed under Section 3 of this chapter.
- 2.178. Any reforms will need to be carefully evaluated and discussed with the industry to ensure that they are able to deliver the benefits suggested. At the same time, the FQA system clearly is not broken so there is no need to rush to fix it. In other words there should be no pressure whatsoever that change is urgently required because the FQA system is in crisis. It is not in

An Appraisal of the Options for the Allocation of Fishing Opportunities in Scotland

crisis, it works, it is understood by the industry and it has demonstrated that it is robust so the option of retaining the status quo, without reform, is therefore a viable and justifiable option.

Annex 1 RELEVANT OVERSEAS EXPERIENCE

Introduction

A1.1. The objective of this activity is to guide consideration of the allocation options for Scotland by: (i) reviewing the theory and basis of rights based management mechanisms (RBMs); (ii) describing the approaches taken in a number of countries; (iii) providing an insight into the development of a suitable approach; and (iv) summarising the conclusions of a number of reports on the subject. This is a working paper that provides material to support drafting of the final report; it does not pretend to be a robust presentation; time limitations prevent a comprehensive and rigorous analytical approach which would be a project in itself. Accordingly, the consultants have identified reports, publications and other sources of information and material from these has been liberally used throughout this document. To reduce drafting time, in the main, individual parts of the report are not referenced to specific authors nor their primary sources; the bibliography lists the main sources used. The substantive analysis will be contained in the final report that will summarise the main findings of the working papers of relevance to the situation in Scotland.

Bibliography

Addison J. H. Powles & I. Scott 2013 Newfoundland & Labrador Snow Crab Ref: 82103 Version 5. MSC Public Certification Report. Intertek / Moody Marine
Adlerstein S., R. O'Boyle & I. Scott 2012. MSC Assessment Report for Chilean Hake (<i>Merluccius gayi gayi</i>) Trawl Fishery Version 1: Client Draft Report. Intertek Moody
Alexander C. & C.J. Alexander 2011 Sustainable Fisheries Development http://constantine.typepad.com/files/sustainable-fisheries-development-5.pdf
Andersen J.L. Danish fisheries Management, fleet structure and economic performance
Anderson L. G. & M. C. Holliday, Eds. 2007. The Design and Use of Limited Access Privilege Programs NOAA
Bonzon, K., McIlwain, K., Strauss, C.K. and Van Leuvan, T. (2010). <i>Catch Share Design Manual: A Guide for Managers and Fishers</i> . Environmental Defense Fund.
Cox S., T. Huntington, P. Knapman, I. Scott 2010 The Canada Scotia - Fundy Fishery for Haddock (<i>Melanogrammus aeglefinus</i>) in NAFO Sea Areas 5Zjm, 4X5Y Version 5. MSC Public Certification Report. Intertek / Moody Marine
Eliassen S., S. Sverdrup-Jensen Aalborg, P. Holm & J. P. Johnsen, Nordic experience of fisheries management Seen in relation to the reform of the EU Common Fisheries Policy
EU 2009 Green Paper of 22 April 2009 - Reform of the Common Fisheries Policy [COM(2009) 163 final
EU 2013 Revised 3-column table concerning the Proposal for a Regulation of the European Parliament and of the Council on the Common Fisheries Policy - 2011/0195 (COD) REV 5 http://cfp-reformwatch.eu/wp-content/uploads/2013/03/CFP_Basic_reg_3-column_document_revised_5-March.pdf

Gómez-Lobo A., J. Peña-Torres, P. Barría 2007 ITQ's in Chile: Measuring the Economic Benefits of Reform http://fen.uahurtado.cl/wp-content/uploads/2010/07/inv179.pdf
E Haraldsson G & D Carey 2011 Insuring A Sustainable And Efficient Fishery In Iceland. Economics Department Working Paper No. 891
House of the Oireachtas Joint Sub-Committee on Fisheries Debate. Thursday, 28 March 2013. http://oireachtasdebates.oireachtas.ie/debates%20authoring/DebatesWebPack.nsf/committeetakes/AG32013032800001?opendocument http://www.fisheries.is/management/fisheries-management/
Inshore Ireland 2012 MARINE DEPARTMENT UPDATE ON STATUS OF INSHORE FISHERIES MANAGEMENT http://www.inshore-ireland.com/index.php?option=com_content&task=view&id=1006&Itemid=206
Kroetz K & J. N. Sanchirico Economic Insights into the Costs of Design Restrictions In ITW Programmes http://www.rff.org/rff/documents/rff-rpt-kroetzsanchirico.pdf
Meridian Institute & MRAG Americas, Inc. 2010 Catch Shares in New England Key Questions and Lessons Learned from Existing Programmes
Mills G. 2011 Inshore Fisheries Management: A Tale of Lost Opportunity? Inshore Ireland http://www.inshore-ireland.com/index.php?option=com_content&task=view&id=928&Itemid=201
MRAG 2010. Towards sustainable fisheries management: international examples of innovation. MRAG Ltd
MRAG, IFM, CEFAS, AZTI Tecnalia & PoEM (2009) An analysis of existing Rights Based Management (RBM) instruments in Member States and on setting up best practices in the EU. Final Report. London: MRAG Ltd. 117 pages.
MRAG, IFM, CEFAS, AZTI Tecnalia & PoEM (2009) An analysis of existing Rights Based Management (RBM) instruments in Member States and on setting up best practices in the EU. Final Report: PART II Catalogue of Rights-Based Management Instruments in coastal EU Member States
OECD 2006 Using Market Mechanisms to Manage Fisheries : Smoothing the path
OECD 2012 Inventory of National and Regional Approaches to Fisheries Rebuilding Programmes: United States
PFMC (Pacific Fishery Management Council) and NMFS (National Marine Fisheries Service). 2010. Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery; Final Environmental Impact Statement Including Regulatory Impact Review and Initial Regulatory Flexibility Analysis. Pacific Fishery Management Council, Portland, OR. June 2010.
Scott I. 2011 Pre Assessment Report for New England Groundfish Fishery. Intertek / Moody Marine
Turris, B. (2009). <i>Management of the British Columbia Groundfish Fisheries</i> . Catch Shares Workshop, October 20-21, 2009. http://www.fisheriesforum.org/sites/www.fisheriesforum.org/files/10587_CSWS%20Turris.pdf

The Issue

- A1.2. For at least the past four decades fisheries on a global scale have experienced major issues over capitalization of the fish catching sector and the over fishing of a large number of stocks. The base of the problem

was non-sustainable fishing practices due to the open access nature of the fisheries. Figure 1 depicts the theoretical cost and value of fishing under three different scenarios: open access without a catch limit, a catch limit set and enforced at Maximum Sustainable Yield (MSY), and a catch limit set and enforced at Maximum Economic Yield (MEY).

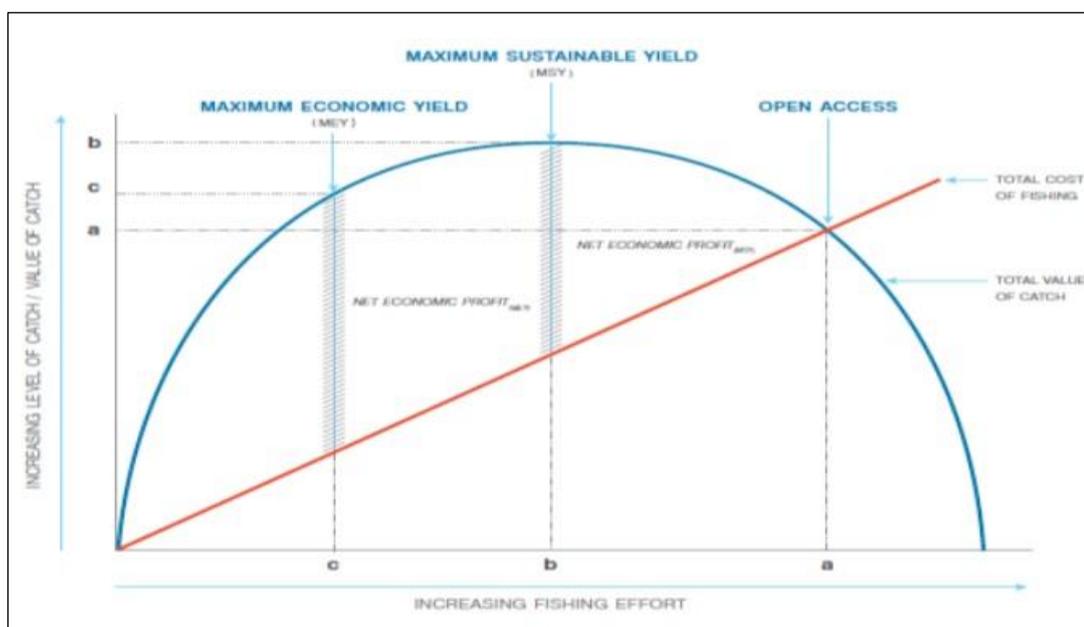


Figure 1: Maximum Economic Yield & Maximum Sustainable Yield

- A1.3. The dark blue line shows the total fleet-wide value of catch for sustained effort levels and the red line shows the total fleet-wide cost of fishing. The difference between the two lines is the net economic profit for the fishery. Under open access (or a fishery with no identified catch limit), fishers generally increase the number of vessels and total effort until there is no net economic profit, i.e., until the total cost of fishing equals the total value of catch (a). Under MSY, the catch limit is set to maximize the amount of catch. The level of effort decreases from open access, but the level of catch increases. Net economic profit also increases compared to open access, but profits are not maximized (b). Under MEY, the catch limit is set to maximize the economic profit of the fishery. The level of catch is lower than MSY, but costs also decrease and therefore net economic profit is maximized (c). Catch shares can operate within any scientifically appropriate catch limit. Setting the catch limit at MSY will maximize the amount of fish removed and setting the catch limit at MEY will maximize the net economic profit of the fishery. Economic theory suggests that In the case of Individual Transferable Quotas(ITQs) or some application of transferable long term use rights to fish resources, market forces will ensure that fishing fleet capacity (number and type of vessels and fishing technology applied) will be adapted to potential quota uptake through the process of maximizing profit / resource rent from the fishery.

A1.4. The management of fisheries has evolved in a number of stages.

- Initially there was open access. There were few limits other than obtaining a readily available permit and the possession of the necessary fishing gear. In profitable fisheries, this led to ever-increasing numbers of participants which put increasing pressure on the fishery resource.
- The problems of free access led managers to implement programmes which placed controls on fishers' activities. They used input controls such as specifying allowable types and amounts of gear and methods, and limiting available fishing areas or seasons. By restricting what operators can do, this type of regulation increases the cost of fishing and creates incentives to change fishing procedures so as to increase catch given the constraints. This has the twofold effect of decreasing the biological effectiveness of the regulation and increasing the cost of fishing.
- Managers also used output controls such as setting TACs, by-catch limits and trip limits for individual fishermen. These management techniques create incentives for fishermen to develop different types of gear or to devise new methods that allow them to catch more fish in spite of the regulations, and to do so faster than other fishermen, before any overall limit is reached. Neither input nor output controls provide incentives for individual fishermen to delay or forego fish harvest, because any fish not caught is likely to be taken by someone else.
- In response to each new measure designed to limit total fishing effort, fishermen develop new fishing methods that undermined the goal of reaching sustainable harvest levels. This prompts managers to promulgate more restrictive measures, and fishermen to work around them. For example, if managers limit the length of the boat, fishermen might increase the width if it would increase fishing power. Instead of trying to build boats and design equipment that can harvest efficiently, with total output controls fishermen have incentives to do everything in their power to modify inputs to catch fish faster than their competitors do. If input controls are used, fishermen will work to get around the constraints. In the short-run, such regulations can be biologically effective because it takes time for fishermen to adjust their gear or behaviour. However, the temporary increase in stock size just helped to finance more changes in such things as boat designs with more fishing power. This phenomenon has been called "the race for fish."

- In addition to conservation concerns, the race for fish can create safety problems. Faced with a sharply curtailed amount of time in which to harvest, fishermen may feel compelled to operate in unsafe weather conditions rather than forgo harvests to their competitors by waiting for fairer weather.
- Limited success has led fishery managers and stakeholders to be increasingly interested in catch shares as an approach for managing fisheries. This interest has been bolstered by research indicating that catch share implementation halts, and even reverse widespread fishery collapse and helps drive economic growth by allocating participants a secure share of the catch, catch share programmes give participants a long-term stake in the fishery and tie their current behaviour to future outcomes. This security provides a stewardship incentive to a fisher that was previously missing or too uncertain to influence behaviour toward long-term conservation. Catch share programmes align the business interests of fishers with the long-term sustainability of the stock, and they provide more stability and predictability within a fishing year and over time.
- Market-like instruments are widely used in managing fisheries on a global basis. These instruments are based on defining access rights to fisheries resources and encompass those administrative regulations that influence fishers' harvesting strategies and the extent to which there is investment is undertaken by individual enterprises to maximise their share of the take. There is a general recognition amongst policy makers that the use of market like instruments can improve the efficiency of fisheries resource allocation and use, and help to better align the economic incentives of fishers' with societal objectives. Specific case studies highlighted other potential benefits of catch shares, including increased compliance in meeting catch limits and enhanced safety, job stability and profitability of fishers.
- The perceived benefits of market mechanisms have led to a shift towards their increased use.
- At the same time, stakeholders may be suspicious of them and this leads to resistance. In part this is due to identifying such instruments with theoretical individual transferable quotas which is the best known market-like instrument. There are, however, a wide range of such instruments available with each having its own attributes and applications.
- The design and implementation of appropriate schemes remains dynamic with innovations on the basis of need and experience,

especially in limiting the potential negative impacts of the approach in relation to identified priorities that may conflict with the pure application of the theory in search of efficiency in the catching sector.

Understanding different design options and how they can achieve various economic, biological and social objectives helps managers and stakeholders make informed decisions about catch share programmes.

Resource Rent

- A1.5. Simply put, economic rents (the distance between the blue line and the red line in figure 1) are "excess returns" above "normal levels" that take place in competitive markets. In economics, rent is a surplus value after all costs and normal returns have been accounted for, i.e. the difference between the price at which an output from a resource can be sold and its respective extraction and production costs, including normal return. Economic rent is defined as resource rent in natural resources such as fisheries. It is also known as abnormal or supernormal profit. In fishing it is the value of the catch in excess of the harvesting costs (including management).
- A1.6. To reflect this situation, the direct beneficiaries (i.e. the fishers) may be charged a fee for the benefit of accessing a public resource. When applied this fees redistributes the abnormal profit to the public, either directly through a payment to the exchequer (tax, fees or royalties), or indirectly through fishers covering all or some of the costs of management, enforcement and research.
- A1.7. In some countries, rent recovery is of prime importance to national economies, and the opportunity cost of failing to extract rent is very high. For example, income from fishing royalties accounts for over 40% of the Falkland Islands gross domestic product, and provides the government with over half its annual income.
- A1.8. A resource rent will impact the catch share. If it is set too high, then it may hamper the flexibility of the system or reduce participants' conservation incentives. On the other hand, setting a low fee may not return as much value to the public.
- A1.9. Catch share fisheries tend to be more profitable than traditionally managed fisheries and better equipped to cover all or a portion of the costs of management. Achieving the transition to catch shares may require an up-front investment by the government, but as the fishery becomes more efficient under a catch share program and as stocks recover, those costs can be shifted to the industry. In New England it was suggested that the benefits of the program in terms of a more sustainable fishery and fleet are expected to outweigh the costs, and a potential fee structure of not more than 3% ex-vessel value could allow the industry to defray programme costs without excessive hardship.

Rights Based Management

What are Rights?

- A1.10. All fisheries involve some rights of which, in fisheries, that relate to users, access, harvest and property. Access rights are common; they are restricted to an identifiable group of rights holders. Other rights include the right to employ a certain type and quantity of gear, use certain types of fishing capital including boats, engines, fish finding equipment and other equipment, enter certain areas at certain times, extraction by species, time and quantity etc. In commercial fisheries a bundle of rights must be acquired to harvest fish in a particular fishery. Thus, for instance, a fishing enterprise may be required to obtain a fishing licence, use specified registered vessels, obtain certain area-time fishing rights, and several quantitative extraction rights (quotas) to a number of species.
- A1.11. RBM is based on legal fishing rights that may be bestowed on stakeholders (fishers, fishing vessels, enterprises, cooperatives or fishing communities) through a number of allocation mechanisms. A catch share programme allocates the right to harvest a specified amount of a fishery's total catch to an individual or group. Groups can be community-based. Managers establish a fishery-wide catch limit, assign portions of the catch, or shares, to participants and hold participants directly accountable to stay within the catch limit.
- A1.12. Six characteristics form the basis of property rights. They are interrelated to a large extent. Combined, they generate a particular bundle of rights which will facilitate particular management outcomes.
- Exclusivity concerns whether others are prevented from damaging or interfering with an owner's rights. It refers to the extent that a person's property rights overlap with the rights of others. Every kind of property right has some exclusivity, but few, if any, are completely exclusive. The greater the possibility for excluding a property right, the lower the common nature of the resource. In the fisheries context, high exclusivity is considered valuable because, by closing the commons, it reduces one of the key incentives to overfish. Fishers have an explicit interest in fishing sustainably in order to protect their capital. In the long run, high exclusivity allows fishers to adjust their investment decision to the quantity of rights for which they have an exclusive use. In the short run, high exclusivity allows for efficient use of existing fishing capacity.
 - Duration is the length of time the owner of a right may exercise his ownership. A short duration leads to uncertainty. A longer duration allows the right holder to get better returns from investments. In a fishery, longer duration encourages the right-holders to contribute to

making the size and age structure of the fish stock conducive to profitable operations, even if there may be an extended waiting period before the benefits may be realised. Thus where there is an aging fleet, a well-designed scheme can encourage new investment which in turns contributes to efficiency.

- Quality of title refers to certainty, security and enforceability of the property right. The more predictable the entitlement, the higher the quality of the title; the smaller the anticipated change over time, the more certain and secure are the rights. High quality of title is valuable because it increases the likelihood that rights holders will invest in fishery management e.g. financing research. Quality of title is also valued because it makes the right generally valid in disputes about rights of possession or for banking purposes. Security refers to the strength of the entitlement of the right with regard to how susceptible it might be to being undermined by other users or by new arrangements and regulations that could arbitrarily reduce the characteristics of the right. Security depends on the explicit or implicit nature of the right and on the way it may be considered under legal cases. To protect the right from other users, some form of enforceability is needed. The higher the level of enforceability, the greater the quality of the title. In the context of fisheries, the “sovereign risk”, i.e. the right of the government to change the rules (unexpected closure of a fishery) for environmental, safety (e.g. pollution) or social reasons (e.g. new allocation of rights) represent a challenge to the security aspect of this characteristic.
- Transferability is the extent to which the entitlement to a right can be transferred by selling, leasing or trading. All degrees of transferability are possible. Transferability is valued because it provides more efficient operators with the option to buy rights from less efficient operators and then allows the holder to make the best use of his time and capital. It is reported that 80 % of catch share programmes worldwide are transferable. In the case of individually-allocated catch shares, transferability refers to trades made between individual participants. In the case of group-allocated catch shares, transferability can refer to trades between different groups and/or within a group. Inter-group trading is generally determined in the design of the programme while intra-group is determined by the group itself.
- Divisibility refers to the ability to divide (a) property rights more narrowly, producing new recognised rights specified perhaps by season, region, ground, species, age or other classification and (b), the amount of quota into smaller amounts and to transfer some quota to others.

- Flexibility refers to the ability of property rights holders to “freely” structure operations to achieve their goals. Flexibility is valuable because it allows rights owners to both use their rights in the most efficient way given technical constraints (including through selling or leasing it) or to modify their production function in order to match their rights entitlements. In the fisheries context, flexibility is of particular interest due to natural fluctuations (in stock recruitment, weather, etc., i.e. the so called “stochastic nature” of fishing activities). Flexible management instruments may allow for increased efficiency in the use of fishing capacities through matching these natural fluctuations (e.g. banking of quotas from one period to another).

A1.13. Each market-like instrument encompasses the six property-rights characteristics; some of which may have a stronger role to play in some areas. For example, it is often considered that some characteristics (exclusivity, duration, quality of the title and transferability) may be more likely to facilitate appropriate investment and structural fleet adjustment, while others may mostly facilitate the efficient use of existing fishing capacities.

Types of Fishery Property Rights

Classification

A1.14. The definition of RBM adopted for one study was “any system of allocating fishing rights to fishers, fishing vessels, enterprises, cooperatives or fishing communities”. The main types of market like instruments are: limited non-transferable licensing (LL); limited transferable licensing (LTL); community catch quotas (CQ); individual non-transferable effort quotas (IE); individual transferable effort quotas (ITE); individual non-transferable catch quotas (IQ); vessel catch limits (VC); individual transferable quotas (ITQ) and territorial use rights in fisheries (TURF). This mirrors the OECD classification (table 1).

Table 1: Types of Rights Based Management

Market-like Instrument	Examples in OECD countries	Key features
Territorial Use Rights (<i>TURFs</i>)	Ocean quahog (Iceland) Oyster (US) Mussels, scallops (NZ) Abalone (Japan) Lakes and some coastal areas (Sweden) Aquaculture (Mexico)	Allocation of a certain area of the ocean to a single user, usually a group, who then undertakes fishing by allocating rights to users within the group. Usually of long duration and with high degree of formal and informal transferability within the group.
Community-based catch quotas (<i>CQ</i>)	Japan, Korea, US (Community Development Quotas for Eskimo and Aleut Native Alaskans), New Zealand (allocation of a permanent share of the TAC to Maori), Canada, Europe (collective quotas allocated to Producer Organisations)	Catch quotas are attributed to a “fishing community” with decisions on allocation of rights within the community taken on a cooperative basis. They are often used in formalising traditional access rights in small-scale fisheries. They provide a high degree of exclusivity, divisibility and flexibility.
Vessel Catch Limits (<i>VC</i>)	Australia, Canada, Denmark, France, Germany, Italy, Ireland, the Netherlands, New Zealand, Norway, UK, US	Restrict the amount of catch that each vessel can land for a given period of time (week, month, year) or per trip. These instruments are characterised by relatively low or moderate levels for most rights characteristics. They provide limited exclusivity and may not reduce the race to fish, while providing some degree of flexibility and quality of title.
Individual Non-Transferable Quotas (<i>IQ</i>)	Germany, UK, Italy, Spain, Denmark, Norway, Canada, Portugal, US, France, Belgium	Provide a right to catch a given quantity of fish from a particular stock, or, more usually, a percentage of a total allowable catch (TAC). Relatively high characteristics of exclusivity and flexibility allow rights holders to use their rights in a least-cost way to secure a given quantity of fish. The race for fish that exists under a competitive TAC is largely eliminated, but the lack of transferability restricts the efficiency of harvesting.

An Appraisal of the Options for the Allocation of Fishing Opportunities in Scotland

Market-like Instrument	Examples in OECD countries	Key features
Individual Transferable Quotas <i>(ITQ)</i>	Australia, Canada, Iceland, New Zealand, Norway, Poland, US	Provide a right to catch a given percentage of a TAC which is then transferable. This instrument rates highly on all criteria. The features of the system allows for appropriate long-term incentives for investment decisions as well as optimising short-term use of fishing capacities.
Limited Non-Transferable Licences <i>(LL)</i>	Australia, Belgium, Canada, Greece, Iceland, Italy, Japan, the Netherlands, UK, US, France, Japan, Spain	These licences can be attached to a vessel, to the owner, or to both and have to be limited in number and applied to a specific stock or fishery to be considered as market-like. By restricting access to a stock, this instrument helps to reduce the race to fish and prevent rent dissipation. However, the lack of transferability and divisibility limits the optimal use of fishing capacity.
Limited Transferable Licences <i>(LTL)</i>	Mexico, UK. Norway and France (to a limited extent)	By making limited licences transferable, fishers are provided with an increased incentive to adjust capacity and effort over the short to long term in response to natural and economic conditions. They are generally given for a very long duration, but are not divisible.
Individual Non-Transferable Effort Quotas <i>(IE)</i>	Allowable fishing days (Iceland, Belgium) Limited number of pots in crab and lobster fisheries (Australia, Canada, France, UK, US) Limited number of fishing hours per day in scallop fishery (France)	Rights are attached to the quantity of effort unit that a fisher can employ for a given period of time. They tend to be used in fisheries for sedentary species and are characterised by moderate or relatively high levels of exclusivity, duration and quality of title.
Individual Transferable Effort Quotas <i>(ITE)</i>	Tradable fishing days (Spain's 300s fleet) Fishing capacity (Sweden)	Transferability makes short and long term adjustment easier and allows for a better use of fishing capacities.

Territorial use rights in fisheries (TURFs)

A1.15. One way of limiting fishing capacity is the establishment of a TURF. This consists of the allocation of a certain area of the ocean and the associated seabed to a single user, where the user can either be an individual or a group. TURFs have frequently been used in fisheries where there are clearly defined and enforceable boundaries and for species that are relatively sedentary. Lobsters, snails and urchins, and shellfish, such as oysters, clams and scallops, have been successfully managed by TURFs. While many TURFs use catch limits for at least some species, some don't so while these TURFs may be sustainable over a period, there exists the possibility of overfishing due to the lack of sufficient controls or information. TURFs have been adopted in a number

of fisheries e.g. ocean quahog in Iceland, oyster in USA, mussels and scallops in New Zealand, abalone in Japan, Sweden where waters around the coast and in the lakes are privately owned up to 300 m.), Finland (where part of the territorial waters are privately owned), Mexico (for aquaculture) and in Italy. In other countries, such as Korea, combined forms of TURFs and community based catch quotas are in place.

Community-based catch quotas (CQ).

- A1.16. CQs consist in attributing a catch quota to a fishing community. Such a system requires cooperative community decisions on how to allocate rights between members of the community. These have also been called Community Development Quotas (CDQs), and Community Quotas.
- A1.17. Permit banks, community license banks and Community Fishing Associations are beginning to emerge, and these entities may be appropriate recipients or holders of catch share privileges. Alaska has both CDQs and Community Quota Entities (CQEs). The CDQs allocate shares to 65 native communities, which are then allowed to fish or lease shares. CQEs are entities that are not granted shares, but are allowed to purchase and fish shares.
- A1.18. Group-allocated catch shares are more common when the goal of the catch share is to promote or benefit a specified group of participants. Reflecting the issues in forming functioning groups, such quotas have generally been implemented where one or more of the following characteristics exist: discrete fishing units with strong social bonds, common interests and values; ability of group to monitor and enforce rules; or mutually agreed upon laws, norms and methods for functioning as a group.
- A1.19. Forms of CQs have been experimented in Japan, Korea, USA (e.g. through CDQs for Eskimo and Aleut Native Alaskans), New-Zealand (through the allocation of a permanent share of the TAC to Maori) and Canada.

Vessel catch limits (VCs)

- A1.20. VCs restrict the amount of catch each vessel can land for a given period of time (trip, week, month or year). Vessel catch limits have been used in a number of countries including Australia, Canada, Denmark, Italy, the Netherlands, New Zealand, United Kingdom, USA, France, Germany, Ireland and Norway.

Individual non-transferable quotas (IQ)

- A1.21. IQs provide fishers with the right to catch a given quantity of fish from a particular stock (on a permanent basis or at the beginning of the fishing

season when IQs are calculated as a relative share of a TAC). Shares are allocated to individuals or individual entities. Recipients are generally fishers and shares are non-transferable. In addition, shares may be allocated to a group of fishers or other entities such as a fishing company that determines the management of the shares. Shares may or may not be transferable between different companies. For example, the entire catch may be allocated to a single Cooperative or it can be split among multiple Cooperatives.

A1.22. Canada used the approach to allocate catch shares to companies that were active in some fisheries; "Enterprise Allocations."

A1.23. IQs are used in a range of countries including Germany, UK, Italy, Spain, Denmark, Norway, Canada, Portugal, USA and France.

Individual transferable quotas (ITQs)

A1.24. ITQs are the best "known" mechanism and have attracted greater attention. They are allocated by some mechanism (usually historic performance) to distribute an allowable catch or global quota. They can be either absolute (fixed quantity) or proportional (a fixed share of the annual total quota).

A1.25. By definition, ITQs are individual quotas that can be traded. In a "pure" ITQ system, quotas will be fully transferable, a situation that does not exist in practice. There may also be Company Quotas.

A1.26. A large number of studies have found that ITQs substantially increase the economic efficiency of capture fisheries. This is due to assigning individual harvesting rights to fishers, go a long way toward solving the most damaging common property problem in fisheries which is the competition for harvests from fish stocks

- Reducing fishing effort and fishing fleets, the least efficient vessels will find it more profitable to sell their quota than to fish it. Over time, this should both reduce excess capacity and increase the efficiency of vessels operating in the fishery.;
- Contributing to fish stock protection and restoration when the quota takes on value through transferability, the owners have an incentive to invest in stewardship of the ocean resource;
- Restoring economic profits and rents to the fishery; For example, with the race to fish dissipated, fishers time fishing trips to coincide with high port prices and thus avoid the large supply gluts of fresh product that occur in fisheries with very short seasons; and

- Creating a basis for a better overall utilization of marine resources. The elimination of the race also permits owners the time to handle their catch carefully, both increasing the product recovery rate and producing higher-valued products (e.g., fresh instead of frozen fish). In the Pacific Whiting Cooperative, product recovery rates went from 17 % to 24 % which corresponds to approximately 10 million more pounds of seafood from the same catch.
- A1.27. Efficient ITQs provide an opportunity to reallocate the resource rent from the direct beneficiaries to society in general.
- A1.28. As MEY has a lower harvest than MSY it has found favour with ENGOs concerned at the ecosystem implications for fisheries that are exploited at MSY to the extent this may affect prey / predator relationships within the food web.
- A1.29. The ability of firms to buy and sell quota in a well-functioning market is necessary to achieve these gains. Designing economically efficient multispecies ITQ systems is challenging because of the need to balance the necessary flexibility for quota owners to match catches with quota holdings against the risks of overexploitation.
- A1.30. The extents to which ITQs lead to economic efficiency depend wholly on the quality of the property rights.
- If the quality of those property rights is perfect or close to it, the fishery will over time become fully efficient in terms of the fish catching sector; the optimal size and nature of fleet will match the optimal yield of the fish stocks (although one has to recall that in a mixed fishery it is problematic to simultaneously maintain this for all species) and the economic return will be maximised.
 - If the quality of the property right is reduced in some way, the economic efficiency of the fishing activity is correspondingly reduced. In the extreme case where some characteristic (dimension) of the property rights value of ITQs, such as exclusivity, duration or security becomes zero, the quality of the property right also becomes zero and the fishery reverts to a de facto common property fishery.
- A1.31. Limited Access Privilege (LAP) program is the US term for ITQs. In turn, LAP is the Congressional equivalent of the term Dedicated Access Privilege (DAP) introduced by the U.S. Commission on Ocean Policy. The Commission defines a DAP as an output control whereby an individual fisherman, community, or other entity is granted the privilege to catch a

specified portion of the total allowable catch. With this assurance in place, there would no longer be an incentive for fishermen to fish harder and faster because each could only catch his or her share of the total. The incentive would then be to catch the full share at a low cost and sell the best quality fish at the highest obtainable price. The Commission stated a preference for the term DAP for several reasons: first, it highlights the fact that fishing is a privilege, not a right. Second, it is an umbrella term that includes access privileges assigned to individuals (ITQs, IFQs, individual gear quotas), as well as to groups or communities (community development quotas, cooperatives, area-based quotas, community-based quotas). Finally, it reflects the fact that the dedicated privilege being granted is access to the fish, rather than the fish themselves.

- A1.32. ITQs are used in a large number of countries including Australia, Canada, Iceland, New-Zealand, Poland, USA, Chile, Estonia and Namibia.

Limited non-transferable permits/licences (LLs)

- A1.33. LLs may be attached to the vessel, to the owner, or to both. Permits or licences have to be limited in number and to be stock/fishery specific to be considered as a market-like instrument. This excludes, for instance, those permits/licences that are attributed at a national level for administrative registration purposes. Limited entry regimes are widely used.

Limited transferable licences (LTLs)

- A1.34. Tradable licences can be attached to the vessel, to the owner, or to both. Some forms of transferable licences are used in Mexico and in the United Kingdom. In some instance, “quasi-transferable” licences systems have been observed (e.g. in the case of implicit tradability as in Norway and in France).

Individual non-transferable effort quotas (IEs)

- A1.35. IEs are attached to the quantity of effort unit (input) the holder of the right can use. It is based on an approach that places a maximum cap on the total number of effort units available, such as days, pots, trawl tows, etc. Shares of the effort units are then allocated to participants either as a finite number or as a percentage of the effort cap and participants are allowed to trade effort units. Managers adjust the effort cap up and down as required for stock sustainability.
- A1.36. Rather than directly controlling the amount of catch, effort-based approaches control the catch as a function of the allowed effort. As the stock decreases, the gear becomes less efficient and effective, thereby leaving a certain amount of stock in the water. There are some distinct

drawbacks to effort-based approaches. First, it may be challenging to effectively predict the appropriate level of effort to ensure stock sustainability. And second, fishers are often able to innovate and develop methods to catch more fish while complying with the total effort units.

Individual transferable effort quotas (ITEs)

- A1.37. By definition, ITEs are individual effort quotas that can be traded. ITEs can take the form of tradable fishing days (e.g. the '300s fleet' in Spain) or trade in fishing capacity (e.g. expressed in terms on gross tonnage. The benefit of tradable effort systems is that they do not require a robust stock assessment to set a science-based catch limit.
- A1.38. Tradable effort shares may be an appropriate approach for fisheries where it is challenging to set a catch limit, due to either lack of data or the characteristics of the species, such as a species with variable annual recruitment. Generally, these fisheries have low by-catch mortality and very weak stock recruitment relationships.
- A1.39. Tradable effort share programmes have most often been used in fisheries targeting crustaceans, such as Australia's West Coast Rock Lobster Individual Transferable Pots Program and Australia's Northern Prawn Transferable Effort Units Program. Furthermore, they are often implemented in fisheries where existing size, sex and season regulations are effectively meeting biological goals, but there is substantial overcapitalization that hampers meeting economic goals.

Combinations

- A1.40. It is possible to combine these individual and group approaches. For example, a Fishery Management Plan (FMP) may identify an individually-allocated catch share, but various fishers can choose to create agreements among themselves and act as a group. In contrast, when a management plan creates a group-allocated catch share, each group may choose to implement individual shares among themselves in order to effectively fish and manage their shares. Many catch share programmes are transferable, meaning participants can buy, sell and/or lease shares. This market allows the fishery to internally adjust to changes in the catch limit and allows participants to enter and exit the fishery. When trading is allowed, participants have more flexibility in how to run their businesses in order to stay within the catch limits, and new entrants can more easily enter the fishery. If trading is not allowed, it may be the case that there is no clear mechanism for exit or entry into the fishery. Potential concerns include illiquid markets (e.g., inadequate demand or supply of quota), individuals or groups that exert influence over the market, and information problems related to uncertainty and decision-making complexity. Markets

experiencing these problems may have little or no gains relative to traditional command-and-control regulations.

Transfers

A1.41. Permanent and temporary transfers of shares are important design features of catch shares. Transfers may be either permanent or temporary.

- Permanent trading refers to buying and selling of the long-term shares. It offers the opportunity for shareholders to make business decisions about whether to stay in the fishery or sell their shares and exit. In the case of multi-species fisheries, permanent trades also allow fishers to develop and pursue a business model based on the suite of fish that they want to target. Permanent trading is also a mechanism for accommodating new entrants who purchase shares from an exiting shareholder or for existing participants to grow their business by purchasing additional shares. Typically, when fisheries are overcapitalized, some holders find it more profitable to sell their shares and exit the fishery, thereby removing excess capacity. By implementing a tradable catch share, the fishery can essentially size itself appropriately rather than allowing fishers to simply go out of business or employing a government sponsored buyback to remove excess capital.
- Temporary transferability, i.e., leasing, is a transfer of shareholders' annual allocation. Leasing is common and occurs on an annual basis once each participant's annual share has been calculated for the year. Therefore, participants generally lease a certain weight of fish. Participants will usually lease for three reasons: to improve economic efficiency (including through regionalization, specialization and better economy of scale); to cover catch overages for directed catch or by-catch; and/or to maximize catch and carryover annually. Leasing increases the flexibility of a fishery within a season, especially in the case of a multi-species program. Leasing or temporary transfers are also commonly used as the first level of access to a fishery for new entrants.

A1.42. It is possible to allow one type of transferability but not the other, e.g. CDQs in Alaska are allowed to lease their annual shares but they are not allowed to sell the long-term share. Under this arrangement, revenues from the share are tied to the CDQ, and therefore the community. Alternatively, the Alaska Halibut and Sablefish Fixed Gear IFQ Programme allow permanent transfers but largely disallows temporary transfers (there are some exceptions). Often called an owner-on-board provision, this is designed to keep active fishers on the water.

A1.43. The unfettered transferability of shares may lead to negative social outcomes. For example, when shares can be permanently transferred, and in absence of other controls, a few participants may concentrate shares, limiting the number of participants in a fishery. In addition, the cost of leasing shares becomes an additional operating cost that may reduce the payment of crew and/or hired captains. However, crew in many catch share fisheries have seen a substantial increase in wages regardless of active leasing. A further consideration is that a transferable catch share programme will require a trading platform or other mechanism to facilitate and track trades.

Trading

A1.44. The selling, buying and leasing of shares can be limited in a variety of ways. Limitations generally fall into three broad categories: geographic trading limits, based on either biological or social boundaries; social trading limits, based on community or fleet characteristics; and administrative trading limits, based on the management of share trading, including timing. When there are clear goals to promote a certain class of participants, or when there are clear biologically-based divisions that are important to recognize, then creating trading groups may be advisable. Sometimes there are laws prohibiting certain restrictions. For example, in the U.S., there are clear legal impediments to establishing shareholder eligibility based on residence, especially residents of different states.

- Geographic trading limitations are important when there are specific goals regarding fish stocks and populations, such as preventing localized depletion. In this case, shares can be divided into a number of geographic areas, with only intra-area trading allowed. Many fisheries that cover a larger area, e.g. British Columbia groundfish, the Alaska halibut and sablefish, the Scotia Fundy groundfish and Newfoundland snow crab, have been divided into a number of distinct management areas.
- Fleet-based limitations may be useful when it is desirable to promote or maintain certain groups within a catch share fishery. This can be directly achieved by implementing a group-allocated catch share, but may also be supported through trading restrictions. For example, there may be pre-existing management divisions such as different gear sectors and a goal to maintain each sector. Additional fleet-based divisions could include limiting trades based on income levels, shareholding amounts, equivalent monitoring systems, licenses and more. This may preserve the historical make-up of the fleet and maintain differences in the fleet. For example, a fishery that has a variety of different vessel sizes may allocate shares based on a specific vessel size and restrict their use to that category.

Take the Alaska halibut and sablefish fisheries that restrict use of quota based on vessel length and vessel type to promote both size classes.

- Administratively-based limitations have been used by some management authorities to limit trading in order to facilitate tracking of trades and catch accounting. For example, some fisheries have limited the size of the transfer unit, the number of trades allowed by year or by holder, or the time in which trading can occur. Another administrative limitation is the use of a “transition period” in which certain features of a catch share programme, such as permanent transferability, are limited for a period of time. This may help participants better understand a programme before allowing permanent transfers of shares. In the British Columbia Halibut IVQ Programme, shareholders were not able to lease or sell shares for the first two years. During the next two years, they were allowed limited transferability. This approach seems to have helped participants understand the system and ease into a new way of management. A transition period will delay the system’s intended results.

Management Goals

- A1.45. All of these approaches are feasible. The key is to assess the goals of the programme and how the overall design will affect incentives of participants in order to achieve those goals.

Issues

- A1.46. The introduction of RBM systems is highly sensitive, despite the potential support of those businesses that may benefit through gaining the opportunity to become more efficient and profitable. RBM is not without potential difficulties, most of which have to do with the potential reorganization of the fishery and its participants. The chronic management problem with open access fisheries is that there are too many people chasing too few fish; RBM has the potential to correct this problem. However, changing the “too many people” to “just the right number of people” is a very difficult social and economic process. Concern is not just about the number of actual fishermen but also the distribution of the harvesting privileges across ports and fleets and the on effect other fisheries-related industries such as boat building and processing. Such effects are sometimes called the unintended consequences of RBM and they can impact such things as community structure. The perceived negative consequences of any rights based approach: (i) the unfair allocation of fishing rights and the distribution of the associated wealth following from the privatization of a public good; (ii) concentration and consolidation of the catching sector and the negative consequences for direct employment and related income; (iii) the consequences of concentration on the local economies of traditional fishing communities;

and (iv) higher entry costs to the catching sector reducing the potential for investment by new entrants and young fishers.

- A1.47. In the Pacific Groundfish fishery a number of issues have been considered including: (i) the concentration of vessels and commercial infrastructure in fewer ports, disadvantaging communities that lose vessels and infrastructure; (ii) isolated communities, where there are few alternative employment opportunities, could be adversely affected by the loss of fishing-related jobs; (iii) in response to changed supply lines, processors could consolidate and possibly move, affecting processor labour and local government revenue; (iv) fishing, in all its diversity, is culturally important to coastal communities; as a consequence, communities experiencing a decline in fishing activity due to fleet rationalization would be adversely affected; (v) tourism could be adversely affected in communities that lose a working waterfront to the degree it is important to the tourist identity of the community; (vi) rationalization would lead to a decrease in the number of captain and crew jobs, while those who remain in these jobs are expected to receive higher wages; and (vii) increased cost for raw fish could occur with fishers assuming a more powerful trading position.
- A1.48. Such concerns have been recognised and have led to fishery managers taking steps to restrict the transferability of rights with the aim of responding to national, regional or local priorities, principally related to small-scale fishers and fishery-dependent communities. This includes consideration of the potential to maximise the economic returns from fish catching through the multiplier effect related to indirect income and employment in the ancillary service sector, processing and the general economy (shops, pubs etc). Even in systems where transferability is significant there are often measures in place to ensure the protection of small-scale fishers and to ensure the possibility of new entrants to the fishery; such as allocating a proportion of national quota to the small-scale sector, and reserving a part of the quota for new entrants in order to build up a track record.
- A1.49. At the same time it should be recalled that where the market model is not perfect this could be to the detriment of one of the main issues and that is the economic operation of the fleet at sustainable levels of capture.
- A1.50. In Nordic countries it has been found that it is possible to design a RBM system in such a way that it contributes to the maintenance of coastal small-scale fisheries. However, at the same time the point is made that the overall development trend in the fishing industry is towards vessels

that are safer, more comfortable and more efficient. The introduction of RBM may reinforce already on-going processes and it would be naïve for managers to take actions in the expectation of halting the trend. Current and future policy must not be regarded as a panacea for all the community and employment problems that have resulted from the significant retrenching, restructuring and reduction of fishing activity in the past 40 years.

- A1.51. In quota-managed systems, the most common requirement for new entrants is to purchase a company and/or vessel with associated quota rights. Because catch shares are often granted to existing participants for free, there is concern that potential new entrants are at a disadvantage for purchasing shares and that catch share fisheries will be prohibitively expensive. If a catch share system is successful, it should be expected *ceteris paribus* that fisheries will be more expensive to enter than open access or other limited access fisheries because catch shares provide more security, stability and predictability. In the long term, the cost of licenses and quotas should reflect the net value of current and future harvests. Artificially reducing the price can undermine the stewardship incentives to the detriment of the programme.
- A1.52. This does not help aspiring fishers. Costs of entry may be high with the need to buy a vessel, a vessel license and a fishing quota. In former times, aspiring new entrants could buy a second hand vessel and trade up if their skill and success merited. Nowadays, limited licensing restricts entry, it is difficult to access credit, and in times of uncertainty and low profitability there is a hoarding of vessels with limited new investment. Existing fishers respond to the climate in the fishing sector by maximising the value of already depreciated assets instead of purchasing more efficient catching units.
- A1.53. The most difficult type of system for newcomers to gain access is thought to be TURFs, where rights are allocated to a group of resource users. Their establishment has often resulted in the exclusion of prior users of the resource (through the conversion from an open access to a privatised regime) and subsequently it can be difficult for newcomers to gain membership of the association or group involved in the TURF.
- A1.54. The issue is to determine a vision of the future that may not necessarily be based on the past but provides a clear guideline on how implemented policy must respond. If maintaining coastal settlements is a political priority associated with RBM, then special provisions (e.g. on the transferability of rights) should be made to safeguard that critical mass will

An Appraisal of the Options for the Allocation of Fishing Opportunities in Scotland

continue to exist in the fishing communities. Where the need to encourage new entrants is an issue, special provisions may be made to facilitate their entrance into a fishery. Indeed this should be a priority; what will happen in the future if there are no trained and experienced skippers to replace the aging existing vintage. It is vital to think about program longevity and transfer to the next generation of participants while designing a catch share program. Significant attention is paid to current participants during the initial allocation of shares, but any successful program will depend on introducing new shareholders over time.

- A1.55. Concentration limits specify a limit on what percentage of the share any one participant or entity can hold and/or fish and are a useful and commonly used design feature (Table 2).

Table 2: Concentration Limits for Selected Programmes

	LONG-TERM SHARE LIMIT	ANNUAL ALLOCATION UNIT LIMIT
ALASKA HALIBUT AND SABLEFISH FIXED GEAR INDIVIDUAL FISHING QUOTA PROGRAM	0.5%–1.5% of the halibut or sablefish shares, varying by management area with exceptions for grandfathered vessels	0.5%–1.5% of the halibut or sablefish shares, varying by management area with exceptions for grandfathered vessels
BRITISH COLUMBIA INTEGRATED GROUND FISH PROGRAM	2% of the total pounds for all species	4% to 10% of a species' yearly catch limit; percent varies by species
GULF OF MEXICO RED SNAPPER INDIVIDUAL FISHING QUOTA PROGRAM	6.0203% of total IFQ shares	6.0203% of total IFQ shares
NEW ZEALAND ROCK LOBSTER QUOTA MANAGEMENT SYSTEM	10% of the shares in any one rock lobster stock without a Ministerial exemption	None
BERING SEA AND ALEUTIAN ISLANDS NON-POLLOCK COOPERATIVE PROGRAM	30% of the quota shares unless grandfathered in during initial allocation	20% of the initial non-AFA trawl catcher/processor sector catch limit
NEW ZEALAND SNAPPER QUOTA MANAGEMENT SYSTEM	35% of combined total allowable commercial catches for New Zealand waters	None
NEW ZEALAND HOKI QUOTA MANAGEMENT SYSTEM	45% of combined total allowable commercial catches for New Zealand waters	None
PACIFIC SABLEFISH PERMIT STACKING PROGRAM	3 sablefish-endorsed permits unless grandfathered in during initial allocation	3 sablefish-endorsed permits unless grandfathered in during initial allocation
NEW SOUTH WALES ABALONE INDIVIDUAL TRANSFERABLE QUOTA PROGRAM	210 shares	Twice the amount of the shareholder's initial quota
BERING SEA AND ALEUTIAN ISLANDS AMERICAN FISHERIES ACT POLLOCK COOPERATIVE PROGRAM	No limit between Cooperatives Cooperatives can determine rules for members	A Cooperative entity is not permitted to harvest more than 17.5% or process more than 30% of the pollock directed fishery allocation
NEW ZEALAND ABALONE QUOTA MANAGEMENT SYSTEM	None	None

- A1.56. Some catch share programmes have set high limits (e.g., up to 45% consolidation cap for New Zealand QMS fisheries), while others have set low limits (e.g., 0.5% – 1.5% consolidation cap for Alaska halibut under the IFQ Programme). Concentration caps usually reflect the structure and relative concentration of a fishery prior to catch share implementation. Social and biological attributes of the fishery are important determinants in setting appropriate caps. What often drives concentration more than the presence of catch shares is the way in which fisheries are targeted. For example, offshore fisheries that require lots of expensive gear and capital

investment will be more likely to have a high level of concentration than near shore fisheries that are easily accessed by smaller boats. This is true for conventionally-managed and catch share-managed fisheries alike.

- A1.57. Different levels of concentration may be appropriate and desirable for various fisheries, so concentration limits should be determined on a fishery-by-fishery basis. Often, managers and stakeholders choose to implement concentration limits in order to meet certain social goals, such as maintaining a certain minimum number of shareholders or encouraging local participation. Having a clear goal and objective for a fishery helps to determine whether a concentration limit is the best approach. For example, if the goal is to ensure the vessels remain owner-operator, then an owner-on-board provision may be more appropriate. If the goal is to protect certain communities, then community shares may be more appropriate.
- A1.58. A number of concepts may be considered to reduce the potential for negative impacts on communities and potential new entrants.

- Permit or quota banks are a new concept that is gaining significant attention as a way of enhancing community benefits, including access to new entrants. A permit or quota bank holds shares and leases them out to participants based on particular criteria, one of which could be focused on accommodating new entrants. For example, the permit or quota bank could charge a lower lease rate to new entrants. Group-allocated catch shares may also develop internal protocols for encouraging and accommodating new entrants. For example, under the Danish Pelagic and Demersal Individual Transferable Quota Programmes, quota holders can group shares under Fish Pools. While Fish Pools are predominantly used to facilitate temporary transfers of these shares, one operates to provide access to new entrants. Existing quota holders can bring quota into this Fish Pool and allow new entrants to access shares in return for an entrance fee.
- Holdbacks reserve shares at the outset of the program for the purpose of making them available at a later date for new entrants (or to address other social goals). For example, 80% of the available shares or catch limit could be initially distributed as shares to historical participants, and 20% could be held in reserve for alternate distribution. This could include a one-time or annual auction of shares to eligible new entrants or annual leasing of the shares. Presumably, leasing would be cheaper on an annual basis and new entrants may be able to participate in the fishery through leasing. Lease-to-own provisions could also be developed. Share holdbacks are gaining support as an important design feature for a variety of purposes, including accommodating new entrants. The Pacific Groundfish Trawl Rationalization Program, approved by the Pacific Fishery Management Council in 2008 and scheduled for implementation in 2011, includes an Adaptive

- Management Program, which retains 10% of the shares to promote public trust purposes, including assisting skippers and crew in acquiring shares.
- Redistributing shares is another option for accommodating new entrants. There are a variety of ways to achieve this, but in general, it requires taking some amount of shares from existing shareholders and then redistributing them to new entrants. Specifically, you could allocate to new entrants increases in the catch limit or shares revoked from non-compliant fishers. Another approach might be to collect a percentage of all shares from participants annually or at punctuated times for redistribution to new entrants. Shares could also be attenuated upon transfer, e.g., a percentage of the traded share reverts back to the management for future distribution. Another form of share redistribution could be achieved by placing terms on shares in which shares expire after a certain period of time and can then be redistributed by the government. This approach may have a significant impact on existing participants and is a good example of trade-offs between goals. While share redistribution may achieve certain social goals, requiring participants to return a portion of their shares for new entrants may make them fish very differently and undermine biological and/or economic goals.
 - Providing appropriate financial assistance is another viable method for accommodating new entrants. Similar to homes or cars, shares are being treated more and more as a bankable asset that can be borrowed against. Lending institutions can offer loans to new entrants using purchased shares as collateral, and some are beginning to do so. Financial assistance and access to shares through leasing or buying is an attractive option, but may be limited. Banks are just beginning to understand catch share programmes, and it is not yet a common practice for them to provide loans using shares as collateral. Programmes at banks and other lending institutions that have a history of financing catch shares may provide good examples for banks in regions with less catch share experience.
- A1.59. In Denmark the solution for new entrants involves a “quota fund” from which interested persons can obtain quota loans for a period of time. In Norway there are special quota allocations available to new entrants, whereas Iceland addresses the concern for new entrants via the community quotas. Some countries have introduced mechanisms to guide the redistribution of withdrawn or returned licences, especially where licensing is the principal management tool. For example, Cyprus has a ‘targeted new entrant’ scheme which aims to re-orientate rights through specific conditions for holding them in the small scale fishery; and Italy has targeted the redistribution of withdrawn, cancelled or returned licences for conservation purposes.
- A1.60. Careful consideration of the potential impacts on program performance and existing participants is necessary before implementing any of these options.

While some of these options may make sense in order to attract new entrants, they may undermine the very purpose of the catch share program – to provide stability and predictability in the fishery and reward participants for being good stewards.

Fishery Profiles

Introduction

A1.61. From the above it is clear that there are a large number of possible scenarios for the introduction of RBM. This section presents a description of some of the programmes that have evolved and provide an insight into the practical application of the approach. It will be noted that they range from comprehensive programmes (e.g. British Columbia) to fairly straightforward approaches (e.g. Faeroes). The examples provide a good overview of the types of issue that Scotland may take into consideration when designing its own scheme. In addition, Appendix 1 presents summaries of various US “ITQ” programmes as detailed in another report.

European Union

A1.62. The use, or not, of RBM within the EU depends on the strategies adopted at the national level. Accordingly, while fisheries management is a Community responsibility, under the framework of the reformed EU common fisheries policy (CFP), economic management of fishing rights is a national responsibility and in practice, many Member States have already implemented RBM approaches in a range of fisheries across the EU. RBM systems in place in EU coastal Member States cover a wide range of fleet and fishery types. All Member States have implemented some type of RBM, Limited licensing is a common means of restricting access to a fishery and the majority of Member States use this either as a main, or supporting means of managing one or more fisheries. In stocks managed by TAC, Member States have implemented a variety of IQ, ITQ and VC systems.

A1.63. In pointing to the fishing fleet overcapacity in the EU as the root cause of the overexploited fish resources and the weak economic performance of the European fishing industry, the EU Green Paper Reform of the Common Fisheries Policy posed the question if transferable rights (individual or collective) could be used more to support capacity reduction for large-scale fleets and, if so, how could the transition be brought about. The paper also asked what safeguard clauses should be introduced. It raised the question if the CFP should adopt a “two tier” management regime: one for the large-

scale fleets where capacity adjustment and economic efficiency is at the core, and another for the small scale fleets in coastal communities with a focus on social objectives.

- A1.64. Initially, it was proposed to have a system of transferable fishing concessions for the majority of managed stocks under the Common Fisheries Policy should be implemented no later than 31 December 2013 for all vessels of 12 m.' length or over and all other vessels fishing with towed gears. Member States may exclude vessels up to 12 m.' length other than vessels using towed gear from transferable fishing concessions. Such a system should contribute to industry-induced fleet reductions and improved economic performance while at the same time creating legally secure and exclusive transferable fishing concession of a Member State's annual fishing opportunities. Since marine biological resources are a common good, transferable fishing concessions should only establish user entitlements to a Member State's part of annual fishing opportunities which may be recalled according to established rules.
- A1.65. This was later deleted to be replaced by Amendment 37 (31a) "In accordance with the subsidiarity principle, each Member State should be allowed to choose its method of allocating the fishing opportunities assigned to it without an allocation system being imposed at Union level. In this way, Member States will remain free to establish, or not to establish, a system of transferable fishing concessions and (29) Member States may introduce a system of transferable fishing concessions. Such a system could contribute to industry-induced fleet reductions and improved economic performance while at the same time creating legally secure and exclusive transferable fishing concession of a Member State's annual fishing opportunities".
- A1.66. The approach in the EU is distinct from most of the countries where RBM has been applied as the policy in these is linked to the approach to maintain sustainable fisheries on the basis of established TACS. In member states, the quotas are given after negotiation of the TACs at the level of Brussels. Thus it may be considered that a basic objective of many countries has less relevance in Scotland where, apart from stocks found in territorial waters, to a certain extent there is still the opportunity for conflict arising from the tragedy of the commons. Until the extension of fishery limits, the conflict was between individual boats that sought to maximise their share of the catch; under the EU the issue lies between individual member states, that although unable to influence their share of the catch due to the policy of relative stability, seek to reduce the impacts on the national fleets by sometimes approving a TAC that does not respond to scientific advice.

Background

- A1.67. British Columbia's groundfish fishery was essentially an ungoverned open-access fishery until the 1970s. In 1976 the Canadian government first attempted to manage it by imposing trip limits. Following the extension of the EEZ to 200 nm, in 1978, Canada first applied annual quotas to the Pacific groundfish fishery and in 1979 the newly-created DFO established license limitations, TACs, trip limits and area, time, and species closures to manage the fishery. Through the 1980s the DFO imposed various area and species quotas and implemented an observer programme.
- A1.68. Throughout the 1980s and 1990s the Pacific groundfish fishery continued to be managed with trip limits. As the stocks were harvested during the year, the amount of fishing time permitted decreased. Overall, this management scheme was a failure. It reduced fishing time, yet allowed fishers to exceed TACs. Stocks declined and the cost of fishing increased, leaving the fishing industry unstable.
- A1.69. In 1980, the commercial halibut fleet harvested 5.7 million pounds of halibut in 65 days; in 1990, fishers harvested 8.5 million pounds in six days. In every year from 1979 to 1990 (except 1980), the halibut catch limit was exceeded and a race for fish resulted in shorter seasons, unsafe fishing conditions, large quantities of discards, poor quality of fish and inconsistent supply of fresh fish (and corresponding low dockside prices). The experience was similar in the sablefish and groundfish trawl fisheries. The groundfish trawl fishery was closed in 1995 due to severe overharvesting of the catch limit and the inability of managers to ensure compliance with catch limits.
- A1.70. In summary, the problems were:
- Resource Conservation: continually exceeding TACs; Poorly quantified total mortality data (misreporting releases, species, area); inability to manage on a stock specific basis; inadequate stock assessment information and research for many species.
 - Economic Viability: overcapitalized fishing fleets; fishing costs high; available fish supply shrinking (overfishing); landed prices falling (supply gluts, poor product quality); increasing risk and instability.
 - Safety: fishing in bad weather; unable to properly maintain vessels; crews working too long.

Management Objectives

- A1.71. Conservation and protection of fish and fish habitat is the first goal of Canada's fishery management. The overarching goals for the Integrated Management Programme include conservation of fish stocks, increased benefits from the groundfish fishery, and a fair distribution of benefits.

Specific objectives are: maintain the existing processing capacity; stabilize employment in the fishery; encourage economic development in coastal communities; ensure the fair treatment of crew; allow for controlled rationalization of the fleet; minimize the negative consequences associated with the leasing and concentration of quota shares.

- A1.72. Catch limits are set annually by each species-area combination and are based on scientific advice provided to managers at the Department of Fisheries and Oceans. Where available, stock assessments are used to set catch limits consistent with government policy on precautionary management.

Rights Based Management

Development

- A1.73. Sablefish was the first fishery to implement IVQs. DFO originally proposed IVQs in 1984, but fishers rejected the idea. In anticipation of the 1990 fishing season, which was projected to last just eight days, an industry group asked DFO for a quota program that was introduced in 1990. Halibut followed in 1991.
- A1.74. In late 1995, industry representatives and DFO began discussing changes to the management of the groundfish trawl fishery and developed a paper outlining six management options. There was a public process including hundreds of comments, and after 14 months of negotiations, DFO established the British Columbia Groundfish Trawl IVQ program. Its goals were to conserve groundfish stocks and make the fishery more stable and profitable.
- A1.75. The IVQ program was successful in increasing individual accountability, improving cooperation among vessel owners, increasing earnings, and keeping catches within TACs. However, fishing licenses were largely based on the vessels' target species. For example, fishers targeting halibut were required to have a halibut license while fishers targeting sablefish were required to have a sablefish license. Fishers who did not hold the appropriate license were not permitted to land those species. Fishers caught many species and this led to the discard large amounts of marketable species. These concerns led DFO to develop a plan to integrate groundfish management and improve the conservation of the fisheries. Beginning in 2006 the DFO implemented a three-year pilot program of integrated groundfish management. The programme, which is now permanent, combines seven groundfish sectors: halibut, sablefish, groundfish trawl, lingcod, dogfish, rockfish caught within Georgia, Juan de Fuca, and Johnstone Straits (known as "inside rockfish") and rockfish caught outside of the Straits ("outside rockfish").

- A1.76. Species not included in the integrated management plan continue to be managed individually under the IVQ program. Currently about 30 species across eight management areas are subject to regulation via ITQs. An additional 50 species are caught in conjunction with the ITQ species.
- A1.77. The IVQ management programme includes a number of important elements: IVQ allocations and caps; transferability / carryovers; stock specific management ; at-sea release/mortality rate; logbooks; hails; dockside monitoring; at-sea monitoring; various other standard regulatory measures (closed area, size limits, gear restrictions, trip limits); and cost recovery.
- A1.78. The programme uses a species-based privilege that allocates secure shares of the total catch for a number of species. However, there are a number of unique rules on trading that vary by gear type and target species. Some of the complexity relates to how the different fisheries were integrated over time.

Eligibility

- A1.79. Eligibility to participate in the catch share program has been primarily driven by historical participation in the fishery. Shares in the Integrated Program can be held by individual participants owning licensed vessels in one or more of the seven directed groundfish fisheries. Only licensed commercial groundfish vessels and/or fishers are permitted to hold and fish shares.
- A1.80. The primary eligibility requirement for initial share allocations was a groundfish-specific license. All initial grantees were required to have a license and eligibility was limited to licenses that directly targeted species within each fishery (e.g., sablefish license holders were eligible for sablefish IVQ, halibut license holders were eligible for halibut IVQ, and groundfish trawl license holders were eligible for groundfish IVQ species).

Allocation

- A1.81. The initial allocation formulas were largely based on catch history or catch history and vessel length. Some shares were also allocated based on equal sharing (e.g., to certain license categories). In the sablefish, halibut and groundfish trawl fisheries, initial share allocation was based 70% on catch history and 30% on vessel length. These data were easily available through fish slips, dockside landings report data and license information.
- A1.82. The sablefish allocations were calculated on the license holder's best annual catch from 1988 or 1989. Both halibut and groundfish trawl allocations were based on catch history from 1986 to 1989. To accommodate all of the species in the groundfish trawl fishery, the allocation formula applied to hake landings and separately to an aggregate of non-hake landings. Individual holdings were then calculated into groundfish equivalents. The resulting percentage for hake landings is

applied to the annual catch limit for hake, while the non-hake IVQ percentage is applied to all species-area combinations to determine specific quota pounds for each species-area.

- A1.83. The halibut fishery followed a similar approach, except DFO established the Halibut Advisory Board comprised of license holders, processors, First Nations and union representatives to determine initial allocation of quota shares. Many proposals were put forward, including equal shares, pounds based on vessel length, auctions and shares based on the number of crew employed. After a four-day deliberation, the HAB nearly unanimously agreed on an initial allocation formula. The allocation formula was voted on by halibut license holders as part of an overall IVQ proposal. 70% of respondents voted in favour of the IVQ proposal.
- A1.84. Lingcod and dogfish were allocated to eligible license holders based on catch history from 1996 to 2003. Rockfish species were allocated to eligible license holders in different manners, dependent on the license. Fishers targeting species under an Inside or Outside Rockfish license were allocated equal shares of the numerous species annually. Halibut license holders were allocated rockfish IVQ as a percentage of their halibut holdings. This is calculated for each rockfish species-area combination.
- A1.85. DFO established an official appeals process for all IVQ fisheries in regard to allocation. For halibut and groundfish trawl, specific review boards were established. The halibut board recommended changes to 30 participants' allocations based on their findings. The allocation for the entire fleet was then recalculated. A similar process for appealing data errors was conducted for the groundfish trawl fishery and the integration of the other sectors.
- A1.86. Under the integration program, certain license holders were eligible for lingcod and dogfish IVQ allocations if they had landed a total of 1,000 and 3,000 pounds, respectively, from 1996 to 2003. To receive rockfish allocation, eligible participants were required to hold inside or outside rockfish licenses. In addition, halibut license holders were eligible for allocation of rockfish quota.
- A1.87. The Integrated Program allocated long-term shares, IVQ holdings, which are a percentage share of the total catch limit for each species-area designation. At the beginning of each season, shareholders' annual allocation units, or IVQ pounds, are calculated by multiplying the yearly catch limits by participants' IVQ holdings.

Transferability

- A1.88. Transferability is an important feature of the management system – supports selective fishing, staying within allocations, economic efficiency, viability, safety and allows industry to adjust to resource and market dynamics.

- A1.89. Transferability was limited from 2004 to 2006. Specifically, 25 % of the original allocation was considered “locked” onto the vessel and could be transferred only via permanent transfers. In addition, each vessel was limited to two one-way permanent transfers of locked quota during the three-year period. The remaining 75 % could be leased.
- A1.90. The trading rules are mainly focused on maintaining sector-specific allocations and limiting concentration of quota into one sector. Within the halibut, sablefish and groundfish trawl sectors, permanent transfers are allowed (i.e., halibut within halibut sector, sablefish within sablefish sector, and groundfish within groundfish trawl sector). The program allows the transfer of quota among these sectors. There is a cap on the amount of quota that is allowed to be transferred out of each sector.
- A1.91. There are many limitations to transfers. Under full integration, regulations regarding transfers between sectors were developed and established and complexity of the rules regarding transferability of quota has increased.
- A1.92. Transfers between the recreational and commercial sectors have occurred in the halibut fishery. Prior to the 2004 and 2005 seasons, the recreational industry was not catching all of the recreational halibut catch limit, and the commercial industry wanted to access that fish. The government allowed the commercial industry to create a non-profit organization that could lease recreational catch limits. Through this arrangement, the commercial sector leased close to 320 metric tons, generating 1.8 million Canadian dollars (U.S. \$1.7 million) for a fund set up on behalf of recreational fishers. More recently, the recreational sector has been interested in leasing shares from the commercial sector. In 2009, a letter was issued by the Sport Fishing Advisory Board soliciting commercial fishers who might be willing to lease quota to the recreational sector. The recreational sector has 1.8 million Canadian (U.S. \$1.7 million) dollars from the previous deals to use toward leasing commercial quota.¹²¹
- A1.93. The integrated IVQ program set out to conserve species by eliminating discards and increasing monitoring. If the TAC for any species in or out of the ITQ program in an area is exceeded, the area is closed. Furthermore, if a vessel exceeds its allocation of a species for any area, it must stop fishing in any areas where the species occurs until quota is transferred to the vessel account to cover the overage. Prior to integration, the amount of non-target fish that a vessel could retain was strictly limited. Under integration, fishers can buy quota for non-target species to cover their by-catch. This system has drastically reduced discards.
- A1.94. The IVQ program includes overage and underage allowances to maximize vessel owners’ flexibility. Fishers who catch more of a species than their quota covers may subtract that overage (in pounds) from the next year’s quota. Additionally, if fishers do not reach their allocation in a season, they may roll the unused portion into the following year. There is a limit (15% for

hake and halibut and 37% for other groundfish species) to how much quota fishers are allowed to roll into or subtract from the following year. If a vessel exceeds its overage allowance, the following year's quota is reduced by the amount of excess overage. In addition, vessels that exceed their overage allowances are prohibited from fishing until they transfer additional quota to cover the excess overage.

Compliance

A1.95. The integrated IVQ programme requires 100% at sea monitoring. Fishers can choose between a human at sea observer and an electronic monitoring system. When vessels use observers, the observer records catch data in a log and upload it directly to the database. Vessels using an electronic monitoring system must record data using video, sensor, and logbooks. The logbooks are then audited: logbook data are compared with dockside reports and a random sample of 10% of the vessel's video footage and sensor data. If the logbooks match the electronic monitoring system, the data are deemed accurate and they are uploaded to the database. If not, the logbook is ignored and the fishing trip is reconstructed using video footage and sensor data. An audit score is assigned to each trip and an annual score is assigned to each vessel to create a matrix. This matrix allows managers to determine reward and penalty actions, which are often in the form of large fines.

Trading

A1.96. Following integration of the groundfish sectors, there has been an increase in the complexity around trading quota. Potential buyers, sellers, lessors and leasees have to be cognizant of the prices, supply and demand within their sector, and of the rules on trading of species between sectors. The complexity of the restrictions has also increased, with inter-sector caps on quota, and some prohibitions on permanent transfers. To help facilitate this market, some privately-operated quota brokers have developed. They help facilitate voluntary trades by identifying willing buyers and sellers and matching them up. Some brokers also provide services for trip planning, quota status updates and fishing logs.

Issues

Concentration

A1.97. Vessel owners were prohibited from owning more than 2% of the total amount of quota pounds of all species and more than 4% to 10% (depending on the species) of the TAC of a single species.

1. The Integrated Program includes a number of concentration limits to prevent over-consolidation in the fishery. Concentration caps vary based on the needs of the participants for each fishery. Some are set

to protect sectors that may be more vulnerable to extensive leasing or sale outside of the sector, while others are set higher to ensure that participants can operate at levels that are profitable. There are caps on trades between individuals and separate caps on trades between sectors (e.g., halibut trading to groundfish). Furthermore, there are identified limits for the long-term share, IVQ, and the annual allocation units for a number of species, areas and sectors.

2. The majority of individual concentration caps are based on percentage of holdings, although some caps limit weight. Individual species concentration caps in the groundfish trawl fishery are based exclusively on a percent of the catch limit and range from 4% – 15% depending on the species. Caps on directed dogfish are set on a weight basis, while directed dogfish shareholders are also subject to caps on all other species, determined as a percent of dogfish IVQ holdings (the caps range from 0.04% – 5.80%). Weight-based caps are also used in the directed rockfish fishery, for non-halibut species in the halibut fishery, and for non-sablefish species in the sablefish fishery. In the sablefish fishery, there is no concentration cap on temporary or permanent transfers, so a single participant could technically own or lease 100% of the quota, although this has never happened and the average quota holdings are around 3.22% (Fisheries and Oceans Canada, 2010b).

Communities

- A1.98. Both groundfish trawl and dogfish implemented hold-back programmes:
- Under the IVQ each limited entry groundfish trawl (Category “T”) licence holder receives an IVQ representing a percentage of the species-specific TAC. The IVQ allocation formula is based on a combination of vessel catch history and vessel length. The commercial TAC for each species is allocated in three different parcels: 80% of the TAC is allocated as IVQ; 10% of the TAC is allocated as Groundfish Development Quota (GDQ) based on joint vessel owner-processor proposals evaluated by the Groundfish Development Authority (GDA) (consisting of representatives from communities, crew and shore workers, processors, groundfish trawl license holders, First Nations, and a non-licensed individual). on the basis of regional development, employment, sustainable fishery practices and other criteria i.e., largely social objectives; 10% is allocated annually to vessel owners in the same proportion as the first 80% unless there is evidence of unfair and inequitable treatment of crews.
 - Under the IFMP, the dogfish hook and line fishery’s annual total TAC is divided into IVQs and the Dogfish Development Quota (DDQ). IVQs account for 90% of the dogfish TAC and were allocated based on the IVQ allocation formula described in the IFMP. The remaining 10% of the dogfish TAC is made available to fishers through the DDQ. Vessel owners or

licence eligibility holders may now apply for a portion of the DDQ, and upon recommendations from the Dogfish Development Committee (DDC), DFO may allocate this development quota to eligible licences for the fishing season.

- A1.99. GDQ allocation is intended to aid in regional development of coastal communities, attain employment objectives, and encourage sustainable fishing practices. CCQ was developed to ensure fair treatment of crew and safe vessel operation. CCQ is allocated to each vessel according to its particular quota holdings unless a complaint has been made and confirmed regarding treatment of crew. In such cases, the offending vessel would not receive any or a portion of its CCQ. While the CCQ program has provided some benefits, critics worry that crew have little incentive to report poor treatment because it reduces the amount of quota for the vessel, therefore impacting the crew members' earnings, and some crew fear being blacklisted.

Fleet

- A1.100. IVQs led to a reduction in every fleet. Each fleet segment is designated by a letter

- 142 T licenses, 127 active before IVQs, 70 active in 2007;
- 435 L licenses, all active before IVQs, approximately 200 active in 2007;
- 48 K licenses, 47 active before IVQs, 32 active in 2007;
- 262 Zn licenses, 260 active before IVQs, less than 30 active in 2007;
- more than 2000 vessels eligible to fish dogfish and lingcod, approximately 40 active dogfish and 100 active; lingcod before IVQs, approximately 30 dogfish, and 50 lingcod active in 2007.

- A1.101. There has been a reduction in small boats. Before the IVQ program was implemented, trawl vessels ranged in size from 30 to 150 ft. That range shifted to 50 to 120 ft. after initial program implementation. The integrated IVQ program has also reduced the number of small vessels in the fishery, but the small vessels that have remained in the fishery have greatly increased their production volume and are able to pay the increased costs of monitoring.

Employment

- A1.102. Crew employment in terms of numbers of people has dropped by approximately 50% in all IVQ fisheries (it varies slightly by fishery). The number of person years of employment has not changed much at all – various program reviews show that the crew jobs that remain in the industry are better paying, longer term, and more stable
- A1.103. Processing employment has also declined, but, similar to crew employment, is more stable and consistent throughout the year.

A1.104. Additional employment has resulted from the at-sea and dockside monitoring programmes, offloading at coastal ports, and associated trucking of the product to the plants.

New Entrants

A1.105. Individuals who were not initially allocated shares generally lease or purchase shares to enter the groundfish fishery. Special programmes also exist to provide access for members of First Nations communities. Under one programme, existing shareholders can offer licenses and quota to DFO for a self-identified price and DFO can choose to purchase or not. If DFO purchases the license from commercial operators, they issue equivalent community-held communal licenses to First Nations. From 2007 to 2009, the government spent US\$47.55 million to acquire 6.43% of the commercial halibut catch limit, 4.77% of the sablefish catch limit, 0.24% of the groundfish trawl catch limit and 44 commercial licenses for groundfish (31 of which were halibut licenses). In addition, the recreational fishery has leased some quota from commercial halibut shareholders on an annual basis to address increasing harvests in the recreational fishery.

Programme Cost

A1.106. The monitoring cost has increased for fishers, especially hook-and-line and trap fishers and those who harvest low volumes or low value product. Prior to integration, hook-and-line and trap fishers paid flat registration fees of \$2,700 in 2004 and \$3,000 in 2005. Those registration fees covered the cost of targeted observer coverage. The integrated program requires fishers to pay for an on-board observer (\$343 per day at sea) or electronic monitoring equipment. Electronic monitoring requires a registration fee of \$975 plus either \$8,000 plus installation to purchase the equipment or a rental fee of \$65 per day for up to 15 days and \$45 for each additional day. Although the high monitoring costs may be negated by greater stability and profitability in the long term, they are significant and potentially prohibitive in the short term for many small operators and prospective new entrants.

Resource Rent

A1.107. Industry and government share the costs of management. Private companies serve as designated service providers for at-sea, electronic, and dockside monitoring, while the government takes on the majority of the roles for catch accounting and management. IVQ holders arrange and pay for all direct costs of monitoring including at-sea and dockside monitoring services.

A1.108. The aggregate monitoring costs for groundfish fisheries are around 5% of the fishery value every year, but costs vary by fishery and fleet. Costs are

around 3% of the total landed value for the hook and line fleet and slightly higher for the groundfish trawl sectors. The costs are lower for the hook and line fleet mostly due to the use of electronic monitoring (EM) instead of on-board observers; daily cost of EM is approximately US\$146 versus US\$52 for on-board observers. Fishers also pay minimal annual license fees.

- A1.109. In the sablefish fishery, the Joint Project Agreement between DFO and Wild Canadian Sablefish (an industry group) dictates the financial responsibilities of industry and management. For example, in 2009/2010 the industry paid C\$1.5 million for fishery monitoring, science and stock assessment, and some management costs. Costs for administration, salaries of government employees, and patrol vessels and aircraft are covered by DFO.

Performance

- A1.110. The Programme is one of the most comprehensive catch share programmes in the world. The multi-species programme includes over 70 species, 30 of which are managed via quota, and includes all commercial fishers targeting groundfish, regardless of gear type. The programme includes a number of innovative design features such as quota set-asides, which are meant to encourage community development and incentivize positive treatment of crew. Additionally, the program requires 100% individual accountability of all catch and uses an innovative monitoring and catch accounting system to support accountability.
- A1.111. The catch share program is successfully meeting its goals. Fleet-wide catch limits are rarely exceeded, by-catch rates have been substantially reduced, revenues and profits have increased, season length has increased and jobs are more stable. The catch share program has a robust system of individual accountability which has ensured catch limits are not exceeded and stocks are doing well.
- A1.112. By-catch had previously been a substantial problem in the groundfish fishery, especially because fishers were often required to discard perfectly marketable species that were caught as by-catch, i.e. directed sablefish fishers discarded halibut due to regulations. One primary impetus for integrating all groundfish species under one management plan was to reduce discards, and the system has been largely successful in accomplishing this goal.
- A1.113. There have been two major innovations. First, integrating all sectors into one overarching catch share program ensured total accountability for the entire BC commercial groundfish fisheries. Second, managers and fishers were able to develop a flexible, innovative system that accounts for different species and different fishing business models. Along with this innovation, partners were also able to develop a comprehensive monitoring program that would work for a variety of different vessels. This included

new technology and applications to provide a variety of solutions to meet the needs of vessels. Managers and fishers continue to innovate in order to enhance biological, economic and social outcomes.

Newfoundland: Snow Crab

Background

- A1.114. Snow crab fisheries are distributed throughout the waters adjacent to Atlantic Canada. The fisheries are defined according to NAFO Divisions 2, 3 and 4 which are then sub-divided. The N&L snow crab fishery takes place both in the Canadian EEZ and in international waters outside the 200 mile limit. For management purposes, the NAFO areas are sub-divided into crab management areas (CMAs).
- A1.115. During the 1970's directed snow crab fisheries developed along the Northeast Coast of Newfoundland, primarily in Division 3L. The fishery in 3K began to develop in the mid-1970s. Snow crab fishing occurred sporadically in subdivision 3Ps in the 1970s but did not occur on a regular basis until the mid-1980s. The fishery in Division 2J also began in the mid-1980s while the first substantial landings in 4R occurred in the early 1990s.
- A1.116. The original snow crab harvesters in N&L had their licenses designated as "fulltime". Their vessels are generally in the 50' to 64'11" range. Fishers with fulltime licenses used to operate in areas fairly close to shore, but now most crab harvested by this fleet segment is taken in areas outside 50 miles. "Supplementary" fisheries were implemented in Divisions 2J, 3K and 3Ps in 1985 and in Division 3L in 1987. These fisheries were initially developed to provide fishers access to snow crab to supplement incomes affected by declining groundfish resources. "Supplementary" fishers in all areas utilize vessels ranging in length from 34' to 64'11". Generally speaking, the smaller supplementary vessels access quotas close to shore while larger supplementary vessels fish in the same areas as the fulltime fleet. During 1994, the supplementary fleet in 3L was divided on the basis of gross registered tonnage (GRT). Those fishers with vessels which were 40 GRT or greater were designated as the large vessel supplementary fleet, while those with vessels less than 40 GRT were designated the small vessel supplementary fleet. The large vessel supplementary fleet had to steam further from land to harvest their quotas. The supplementary and full time fleets in Division 3L were spatially divided in 1997. Fishing activities by large supplementary and full time fleets were restricted to areas outside approximately 50 miles from land. This resulted in the small supplementary fleet and those with temporary seasonal permits having sole access to the snow crab resources inside 50 miles. Participation in the fishery greatly expanded in the 1995, when 400 temporary seasonal permits were issued by random draw to eligible harvesters in the inshore fleet (<35'). The intent

was to provide economic opportunities to small boat enterprises in light of declining groundfish resources and increasing snow crab resources and TACs.

A1.117. These changes resulted in the number of licenses increasing from about 70 in the early 1980s to more than 600 by 1988 to a peak in the late 1990s of more than 3,400. In 1996, DFO mandated the development of IFMPs for each fishery. In 2003, temporary seasonal snow crab permits were converted to inshore licenses for those crab fishers who held a temporary snow crab permit in any one of the years 2000, 2001, or 2002.

Rights Based Management

A1.118. The N&L Integrated Fisheries Management Plan for snow crab fishery is managed on the basis of stock assessments in five fishing areas: 2J; 3K; 3LNO; 3Ps and 4R3Pn. In addition, in area 2H there is a snow crab fishing area exclusive to the Nunatsiavut Government, which also has fishing rights in 2J. CFA 13 in northern 4R is co-managed by N&L and Québec Regions.

A1.119. Into the 1990s all snow crab fisheries in N&L were conducted on a competitive basis. The mid-East Coast of Area 3K piloted an IQ system in 1995. In addition, all enterprises that were issued temporary seasonal permits during 1995 fished with an individual or boat quota. In 1996 this pilot was extended to all areas except Area 2J, an area with less than 5% of all snow crab licences. Shortly thereafter, all snow crab fishing regions had gone to IQ management - within each area and fleet type, each licence holder received the same initial quota. All fleets in most areas are now fishing under this management regime.

A1.120. The basic criterion for movement from a competitive fishery to an IQ regime was agreement by at least two-thirds of the license holders in each fleet. Fleet representatives determined the specific quota sharing arrangements.

Allocation

A1.121. Quotas are allocated to three distinct fleets in the N&L snow crab fishery: Full time license holders (50 – 65 ft.); Supplementary license holders (35 – 65 ft.); and Inshore (seasonal) permit holders (less than 35 ft.). In addition, there are 21 communal licenses. The quota allocation in each CMA is equally divided between the individual vessels.

A1.122. IQs are not a guarantee that the fisher would land that amount of crab. This is due to the specific case that landings of soft shell crab in excess of 20 % lead the fishery in a CMA to be closed.

Conditions

A1.123. There are Owner-Operator and Fleet Separation Policies for vessels in the less than 65" vessel category in N&L. The Owner-Operator Policy requires that a licence holder fish the licence personally and be on board the vessel

unless a designated operator has been approved. The Fleet Separation Policy prevents inshore fishing licences from being issued to corporations, including corporations in the processing sector. An exception to this policy was introduced in 2011 whereby Independent Core fish harvesters may hold licences in the name of their wholly-owned company.

Transferability

- A1.124. Under a strict owner-operator clause, there can be no quota transfer and consolidation of fishing privileges.
- A1.125. Starting in the 1990s with the inception of the inshore fleet, a partnering approach was introduced, known as buddy-up, whereby two licence holders may fish together on one vessel while both licence holders, or their designate if approved, must be on board while fishing. In 2006, the buddy-up option was adopted temporarily for the over 40' or 12.2 m fleet (formerly over 35' or 10.7 m fleet) as well.
- A1.126. In 2008 DFO introduced the "enterprise combining" policy whereby a fishing enterprise could purchase permanently the snow crab quota entitlement of another person in the area so long as: (i) all licences held by the selling enterprise were transferred and the selling enterprise removed or retired its vessel registration, and (ii) the purchasing enterprise acquired at most two times the individual quota level.

Canada Scotia Fundy

Introduction

- A1.127. From January 1, 1977, Canadian management prioritised stock recovery. Target fishing mortality was substantially reduced from previous actual levels, while measures were taken to develop an economically-viable fishing industry. The new policy encompassed fleet upgrading, industry modernization, marketing and quotas (e.g. ITQs and enterprise quotas (EQs)). These measures, however, met with limited success; fishery management measures were poorly enforced and the Canadian fishery industry was characterized by resource depletion, vessel tie-ups and overcapacity.
- A1.128. In response to these problems, in January 1982 the Federal government appointed a new Task Force on Atlantic Fisheries. The resulting Kirby report (1983) encouraged the permanent use of Enterprise Allocations (EAs) to companies operating in the trawler fishery to facilitate better management of the fleet and reduce capacity. However, the practical application of fisheries management was problematic (misreporting of landings, poor reporting on discards and inaccurate resource assessments) and overfishing continued.

- A1.129. The Scotia-Fundy groundfish fishery is composed of three distinct fleets, the inshore groundfish mobile gear, inshore fixed gear, and offshore fleets. These fleets, which targeted various groundfish species, including cod, pollock, haddock, flatfish, and redfish among other species, grew dramatically in the 1970s and early 1980s.
- A1.130. In 1989, a task force was commissioned to assess the situation of the Scotia – Fundy fisheries. The resulting report included many recommendations, including a reduction in fleet capacity through the use of ITQs.
- A1.131. In the 1990s, a series of special federal programmes, including the Atlantic Fisheries Adjustment Plan, The Atlantic Groundfish Strategy and the Canadian Fishery Adjustment and Restructuring Programme sought to limit the impact of the reduced fishing opportunities. Special measures included financial assistance for groundfish fishers and certain communities. Under voluntary licence retirement programmes, fishers who retired their licences instead of transferring them to other harvesters received compensation payments.

Mobile Gear

Background

- A1.132. Following adoption of the 200-mile EEZ in 1977, growth in fishing capacity was encouraged by government financial assistance through loans and subsidies for vessel building from 1978 to 1982. After this period, high fish prices sustained growth of the fishing fleet. Excess capacity began to cause problems for the fleet during the 1980s. A study in 1986 found that the inshore mobile gear sector was four times the size required to harvest the TAC. Prior to implementation of the ITQ program, this sector consisted of up to 455 vessels under 65 ft. in length.
- A1.133. Beginning in the 1970s the fishery was regulated by a hard TAC. During the 1970s and 1980s, the inshore mobile gear groundfish fishery operated under a competitive quota regime, in which license holders fished competitively for the fleet-wide quota. Licenses could be transferred to other full-time fishers within the same fleet size class and they could be held for two years if the license holder did not have a vessel to use in the fishery. In addition to limited entry licensing, a number of other management measures were implemented to curb fleet capacity, including vessel size limitations, gear restrictions, trip limits, fishing ground closures, and seasonal quotas. However, by the late 1980s groundfish stocks off of Nova Scotia showed evidence of severe declines in biomass. A decline in harvest, particularly of cod and haddock, followed this decline in biomass.
- A1.134. In 1989 the TAC for the inshore mobile gear fishery was reached six months into a twelve month fishing season and the fishery closed until the

following year. A task force was convened to address overcapacity of the fleet and low biomass of stocks. The task force identified a number of recommendations for the fishery, one of which was to implement an individual quota system for the inshore groundfish mobile gear fleet. DFO implemented an ITQ system to address concerns of fleet overcapacity and overfishing.

Rights Based Management

Species

A1.135. The ITQ program was implemented in January 1991. While the inshore groundfish mobile gear, inshore fixed gear, and offshore fleets exploit some of the same groundfish stocks, the ITQ program applied only to the inshore mobile gear fleet with vessels less than 65 ft. in length. The program was initially implemented for 6 groundfish stocks, including 4 cod stocks, haddock, and pollock, and was later expanded to cover 12 groundfish stocks, including cod, haddock, flounder, redfish, and pollock stocks.

Participation

A1.136. At the time of the introduction of ITQ, there were 455 mobile gear license holders. Of these: 325 chose to participate in the ITQ program; 50 decided to fish as “generalists” in the non-ITQ mobile gear fishing pool, agreeing to pool their individual allocations and fish competitively for the pooled overall allocation; 74 dual fixed/mobile gear license holders opted and remained in the non-quota, competitive fixed gear sector of the fishery, and 6 licenses were cancelled.

Allocation

A1.137. To ensure the continuance of full stakeholder consultation, a working group composed of representatives from the fishing industry, provincial governments, and DFO was developed to determine allocation of the catch shares. The chosen allocation attempted to minimize changes in activity levels and provide access for individuals to fish who had not fished in recent years. The final allocation was based on an average of the best two catch years during the 1986-89 fishing seasons. Catch histories used were associated with fishing licenses instead of individuals or vessels. Three types of appeal were established: disputes over catch history dual gear catch history, and extenuating circumstances.

A1.138. In 1996, to reduce capacity, the government mandated that every vessel have minimum QS of at least 2 mt of cod, 2 mt of haddock, 2 mt of pollock, and 1 mt of flounder to participate in the fishery. Today the fleet consists of approximately 130 otter trawl vessels ranging from 25 to 65 ft. in length.

Transferability

A1.139. For the first two years of the programme, transfer of Quota Pounds (QP) only (not Quota Share (QS)) was permitted, but in subsequent years both types of transfer have been allowed.

A1.140. QP transfers are generally restricted during the open season to vessels of the same gear type, but after the season ends, out-of season transfers are not subject to the same restrictions. Although retrospective balancing and other flexibility mechanisms are allowed, if the TAC is reached for a particular area, the area closes and thus constrains the catch of the other species in the area.

A1.141. Two policies that have been eliminated are a species exchange rate and a schedule for deducting overages from the following year's catch.

Concentration

A1.142. The fishery is organized into fishing areas. Species aggregation limits restrict quota holders to no more than 2% of the TAC per species per area. Retrospective balancing is permitted up to 45 days after landing, with a provision to allow for the donation of extra catch to the government.

Lessons Learned

A1.143. While no pre-set objectives were defined for the program, there was an overall acceptance of the allocation and appeals processes. Some complaints arose from license holders who disagreed with their catch history records and the low allocation they received. These complaints were handled through the appeals process, which had clearly established guidelines. General satisfaction with the process was demonstrated by the continued use of catch history associated with licenses as the basis for allocation decisions when additional stocks were added to the ITQ program after its inception. This same formula was also used as the primary allocation basis for individual quotas in the Scotia-Fundy Groundfish Fixed Gear Sector fleet in 1997. The involvement of fishers in the working group which determined allocation of the catch shares and the opportunities for license holders to voice their opinions throughout the development process are widely seen as contributing factors in the acceptance of this ITQ programme.

A1.144. A number of changes occurred in the Scotia-Fundy inshore mobile gear fishery after the ITQ program was first implemented that can offer insight into this program and allow for lessons to be drawn for the design of catch shares programmes.

- In a comparative study between vessels in this ITQ programme and fixed gear vessels not governed by an ITQ programme, researchers

found that fishers in the ITQ programme allocated their catch throughout the fishing season, which subsequently increased the quality and price of their product.

- This programme has highlighted the importance of ensuring the durability and security of the catch shares. In 1993, concerns about the biomass of the stock led DFO to close the fishery halfway through the season. This closure prevented some ITQ fishers from catching their quota, which undermined confidence in the program and created hesitancy in fishers to spread their quota over the subsequent fishing seasons. Thus, in implementing catch shares programmes, it is important to utilize a sufficiently conservative initial TAC to prevent the need to close the fishery mid-season.
- In ITQ programmes quotas are traditionally defined for individual species. While the Scotia-Fundy mobile gear ITQ programme conforms to this tradition, it also reveals potential problems that are inherent in multi-species fisheries. One can assume that if quotas are imposed on only some of the target species of a multi-species fishery that fishing pressure may be displaced onto non-ITQ stocks. In response to this displaced effort fishery managers would likely subject these stocks to quotas as well, as seen in the expansion of the Scotia- Fundy fishery from 6 to 12 stocks. Adding stocks to the ITQ program increases the difficulty of administering, implementing, monitoring, and enforcing the management measures. In the Scotia-Fundy fishery, drastic cuts in quota that resulted from large biomass declines did in fact lead fishers to target other species, including flounder and redfish, which later led to the expansion of the program to cover those stocks.
- At the inception of this particular ITQ program, fishers were permitted to cover excess catch of one species by using quota for another species at a predetermined rate. This practice led to species being targeted and landed for which fishers had already exceeded their quotas. As a result, the practice was prohibited. Spillover effects should be taken into consideration in multispecies catch shares programmes.
- The ITQ program facilitated the voluntary exit of fishers from the fishery. By the end of 1991, 321 vessels had licenses with quota shares. This number fell to 249 licenses with permanent shares by the end of 1998. Actively fishing ITQ vessels decreased from 268 in 1991 to 137 in 1998. This reduction in fishing effort was enabled by provisions in the catch shares programme that allowed multiple quota licenses to be fished by a single vessel through the temporary transfer of quota. This strategy reduced the need for traditional license buybacks and other regulatory approaches that have been used in the past to reduce capacity and that have often been expensive and ineffective. In a fishery that historically suffers from overcapacity and

low fish biomass, developing means to effectively reduce fishing effort is an important aspect of a new management programme.

Core Fishers

A1.145. In the early 1990's, the "core fisher" policy designated those fishers with vessels of <65' as having "a solid attachment to and dependence on" the fishery. From 1996 on, only core fishers could acquire most licences from other fishers. The concept was that as less active fishers sold off their licences to core fishers, the total number of enterprises would gradually diminish and fishers with a long-term stake in the industry could become dominant.

Fixed Gear

A1.146. The fixed-gear (long-liners and gillnetters) groundfish > 45' <65' sector switched to ITQs in 1997. From 2001, the replacement of existing vessels by larger ones was allowed as long as these were below 65' and applied other capacity restraints. In addition, fishers were obliged to pay for dockside monitoring programmes provided by independent companies that included hail-out and hail-in and the confirmation of landings by species.

A1.147. The <45' FG fleet remains under a competitive fishery with restrictions on the size of vessels permitted to be used. The available quota for this sector is sub allocated to community groups based on catch history of their members. There are eleven management Boards in the Maritimes region. The Boards are permitted to trade quota on a temporary basis at the community level.

Community Quotas

A1.148. Another key policy was community-based quotas. An initial trial covered all FG vessels up to 45' in length, or about 2,500 boats. Each area or group (some "communities" were defined by gear) received a quota and management boards were set up to cover the whole Scotia-Fundy sector. Boards regulate such matters as the sub-allocation of the community quota, the transfer of quota between management boards, trip limits, seasonal or fleet quotas and ITQs. They can also review catches, apply sanctions against rule-breakers and deal with business matters.

A1.149. Community Management Boards (CMB) are linked to the community quota approach (introduced on a pilot basis in 1995 and effective for all fleets < 45' from 1996) for the inshore < 45' FG sector. These input into in-season management and develop, implement and monitor controls on the activities of the community fleet. The CMB's meet together on the < 45' FG Groundfish Committee that approves a DFO prepared Conservation Harvesting Plan (CHP). The approach towards the preparation of CHPs may vary. For example, in Shelburne, there are two management boards,

one comprised of five different associations, each of which develops a harvesting plan. In the other Shelburne CMB, there are three associations and corresponding plans.

Results

- A1.150. The progressive adoption of quasi property rights schemes for all groundfish fleets (except for FG < 45') has reduced the motivation to overcapitalize vessels and fishing gear with the objective of gaining a larger share of a shared quota. It has also created an incentive to participate in government industry surveys and cooperative research projects with the objective of improving the information base needed in order to make relevant investment decisions.
- A1.151. The ability to transfer quotas from one license to another allows permits users to maximize their economic returns from the resource.
- A1.152. It may be argued that the approach to management of the small boat sector (Community quotas as opposed to ITQs) has potentially impacted interest in using certain types of gears (most notably the hand line) as established quotas have not been sufficient to maintain financial viability. On the other hand, it may be considered that high returns in other fisheries, specifically lobster, may prove to be a disincentive to undertake additional fishing outside the lobster season.

Chile Industrial Fleet

Background

- A1.153. The management of industrial fisheries in Chile was for the most part based on the use of an annual TAC, effort restrictions (licenses) and the seasonal closure of fisheries. During the 1980's the most important Chilean fishery was the northern pelagic one based on anchovy and Spanish sardine; both used in the production of fishmeal. While industrial catches of the latter peaked in 1985 at 2.6 million mt, by the end of that decade the trend was towards collapse as landings reduced considerably. This led to new effort in the southern pelagic fishery based on Jack mackerel, to which the industrial group owning the fleet and processing plants in the north migrated. This group successfully lobbied to ensure that an ITQ system based on historic rights that would have made this migration much more costly was not introduced.

Rights Based Management

- A1.154. Due to fears of overfishing along with a short fishing season impacting the capacity utilisation of on-shore processing with a consequent reduction in employment, an ITQ system was established for the southern pelagic fishery in 2001 on the basis of recent annual catches.

A1.155. 5% of the annual TAC is available for leased by the government. Until end-2012 the decision making process on TACs involved consideration by five regional councils, a process that led the national fishery council (CONAPESCA) to recommend a quota to the Government ministry SUBPESCA. Due to lobbying from artisanal and industrial fishing interest groups the eventual TAC was often above that recommended by scientists. The new Law has ended CONAPESCA

Transferability

A1.156. There are two ways in which quotas are transferable. First, the new law gives ample flexibility for companies to merge their fishing operations during a particular year. Thus, private agreements can be made to share or 'rent' the quotas for a period of time. Companies are not obliged to use all of their authorized ships, and ships not used during a particular year were initially exempted from the annual payment of the licensing fee. Second, a ship can be irrevocably retired from the fishery.

Duration

A1.157. In 2001 the ITQ system was extended to all of most important industrial fisheries in Chile. Initially of 2-years duration on the basis of the need to provide companies with a long term basis for planning it was later extended to end 2012. The current situation is uncertain as a new Fisheries Law had to be introduced as of January 1, 2013 and there is on-going debate. However, it is considered highly unlikely that this will result in any major changes to the use of ITQs.

Concentration

A1.158. The established system explicitly facilitated the merger of fishing operations of fleets from different companies, a sort of 'operational transferability' of quotas; as result the number of boats in operation was reduced drastically from 148 in 2000 to 65 in 2002. It was possible for a vessel to be irrevocably decommissioned with kits fishing rights transferred to another vessel within the company. To further rationalise the fleet, subsequently a number of companies were combined.

A1.159. Only the largest (from 500m³ to 1,900 m³ of storage capacity) and newest boats were kept active, so improving the financial condition of the sector. Fishing operations were programmed resulting in improved quality and continuity of landings and encouraging production of higher value items.

New Entrants and Fishery Communities

A1.160. In Chile the main socio-economic benefits stem from the large artisanal sector. This is largely open access (apart from TURFS – see below), has

exclusive use out to 5 nm and gains a share of the established quotas for species found in that area. Chilean policy is explicitly socially orientated and in developing policy considers the value of on-shore activities.

Resource Rent

A1.161. While the need to encourage the change to ITQs limited the potential for consideration of redistribution of resource rent, there was an increase in the licensing fee. Additionally, the vertically integrated companies pay independent dockside monitors while the industry established a second research institute (INPESCA) to develop its own analyses and respond to the state entity IFOP.

Quota Sanctions

A1.162. Companies that do not report their landings or are caught discarding fish (this is in theory illegal but has continued especially due to high grading; there is a new Law on Discards (2012) to respond to the various issues) loses 30% of its quota for that year. If the landings reported by a company are not confirmed by the independent auditor, 10% of its yearly quota is deducted. If a company lands in excess of its quota in a given year, three times the overage is deducted from the following year's quota.

Chile TURFS

Background

A1.163. The loco, a sea snail also known as the "Chilean Abalone," is Chile's highest value mollusc species and important to artisanal fishers, who have been harvesting loco for decades. In the mid-1970s, a loco export market developed and shortly thereafter stocks began to rapidly decline. From 1981, managers implemented numerous traditional management approaches, including season limits and catch limits, with little success. Catch limits were continually exceeded by large amounts, and seasons became shorter and shorter. In response, informal TURFs were established from 1988 where harvest was rotated through experimental no-take zones and open areas. The fishers regulated the areas themselves. In 1990, managers implemented a closure on the loco fishery for two years; the informal TURFS were exempt.

Rights Based Management

A1.164. This led to the formation of Chilean National Benthic Resources Territorial Use Rights for Fishing Programme (TURF Programme). This now includes over 17,000 artisanal fishers co-managing over 550 distinct areas along the coast. The average area covered by a TURF is 100 ha.

A1.165. The voluntary system was primarily established to manage loco, but as it is to provide secure access to benthic resources to groups of artisanal fishers most of the TURFs are multi-species with the individual management plans identifying more than one species that fishers are able to harvest (at least 63 species including molluscs, algae, crustaceans, finfish and other invertebrates are landed under the TURF Programme). Management is built on science performed by universities and consultants, resulting in co-management by the government, industry and the private sector.

Goals

A1.166. SUBPESCA identified the following key programme goals: (i) contribute to the conservation of benthic resources; (ii) contribute to the sustainability of artisanal economic activity; (iii) maintain or increase biological productivity of benthic resources; (iv) increase knowledge of the functioning of benthic eco-system; (v) generate useful information for management; and (vi) promote participative management.

Eligibility

A1.167. Defining eligible participants was an important aspect for meeting the goals of the catch share programme. The programme is exclusively designed to manage artisanal fishers in near-shore waters, and there are many provisions outlining participation. First, the programme allocates secure access to groups, rather than to individual fishers. The government outlines specific requirements for groups that are eligible to apply. Second, in order to meet the goal of encouraging artisanal fishers, the programme also outlines clear rules regarding membership within groups. Only cooperatives, unions, or guild associations can apply for a TURF.

Artisanal Fishers

A1.168. The law distinguishes four types of artisanal fishers: Shellfish divers, who extract molluscs, crustaceans or echinoderms and must complete formalized training including theoretical and practical instruction; Seaweed collectors, who collect seaweed; Fishers, who are captains or crew of an artisanal boat; Ship owners, who are limited to one or two artisanal boats, defined as 18 m. or less in length and 50 tonnes or less; if the ship owner has two registered boats, they together must not exceed a combined 50 tonnes.

A1.169. All fishers within the catch share programme must belong to a fishing organization, and reside, at least part-time, in the area adjacent to the TURF. A fisher may belong to multiple categories, e.g., shellfish diver and fisher, but is not permitted to be registered in more than one region. The main purpose of this regulation is to prevent migration pressures on productive benthic areas.

Establishment

A1.170. Fishers may only harvest loco within an established TURF. The system was implemented through a voluntary application-based system with three main components. First, the government identified a series of eligible landing places. Groups of fishers (mostly) residing in these are eligible to apply to the government to manage the adjacent benthic resources via exclusive access. When a fishing organization from a sanctioned landing place applies for a TURF, they are required to submit an initial baseline study of the claimed area, including population assessments for species requested for harvesting. This study is conducted by an external consultant and used to establish the catch limit, when possible, for requested benthic species. A catch limit is required for loco and the Undersecretary of Fisheries confers final approval of the TURF only after scientific recommendations are made. Every fishing organization granted a TURF is required to conduct yearly follow-up assessments of stocks in the management area to assess the species' health, adjust catch limit, and to determine if species without catch limits are still open for fishing. Indicators such as declining catch per unit effort, disappearance of an indicator species and social cues such as amount of infighting amongst members are used to manage species in the TURF that do not have an established catch limit. The ban on loco fishing outside of TURFs provides a strong incentive for fishers to form or join organizations and apply for official recognition.

Access Rights

A1.171. Through the programme, established groups of fishers from sanctioned landing places are granted exclusive access to publicly owned benthic resources via an area concession.

Administration

A1.172. Once the application is approved and the TURF is granted, fishing organizations choose how to administer their own fishing activities. For species with a catch limit, there are a number of basic approaches that have been used. Some organizations evenly distribute the catch limit among fishers or among diving teams (divers and crew members). Others allow fishers to fish as they choose until the catch limit is reached; in these cases the fishers pay a percentage of catch profits to the fishing organization, which then divides this among members who participated in organization-wide duties. Sometimes fishers pool all profits and then evenly distribute the profits to active fishers and inactive fishers who take part in other activities required for running the program.

A1.173. Participants are required to collect landing data for all managed species including the number of individual organisms extracted, size and location. This information, along with the yearly stock assessments and extraction plan, are submitted to the government for review. The National Fisheries Service verifies the information against sampling data gathered by inspectors.

Transferability

A1.174. The rights are non-transferable; TURFs are not allowed to transfer their secure allocation to another group or area. If an individual fisher leaves an area or an organization, access to the TURF is surrendered.

Duration

A1.175. Successful applicants are granted a TURF for four years and groups can renew the area concession by submitting another application. Fishing organizations can lose their access if the organization fails to pay yearly taxes or if the members use the resources in a non-approved fashion, including introducing exotic species, extracting organisms during banned periods, capturing species under the minimum size, or using forbidden techniques for capture.

Achievements

A1.176. The TURF Programme has been successful in assuring access for the artisanal sector and improving knowledge of the resources. Every TURF is required to conduct regular stock assessments. Landings have increased as much as five-fold, the mean individual sizes of individual organisms has increased, catch per unit effort is up, and some fishing organizations have established no-take areas (areas in which fishing is prohibited) to enhance spawning within their TURF.

A1.177. There has been some overharvesting and illegal harvesting does still occur, especially in open access areas and by fishers who are not participating. Fishers have also modified their TURF to maximise revenues by systematically removing predators, by seeding the area with target species taken from other locations, and intentionally leaving loco prey species within the system. The government has clarified that resources may only be brought into the TURF once, during its formation and issued a Regulatory Decree that states that predators should not be removed so as not to inflict negative impacts on environment.

A1.178. Fishers have also innovated within the program. Some fishing organizations have combined into larger marketing cooperatives in order to sell resources between their organizations and create economies of scale for exportation. For example, in central Chile, fifteen fishing organizations created the PACIFICOOP to form strategic alliances with exporters and

generate better prices. In Southern Chile, five fishing groups created a private company called TERPESCAR, which has gained rights to administer landing ports, thereby generating further income. Near some wealthier urban areas, fishers have further enhanced their profits by creating and supplying “live” fish markets and developed dive tourism within the TURF.

Denmark ITQ

Background

- A1.179. Denmark has a long fishing tradition. With over 400 islands and close proximity to productive fishing grounds, the Danish fisheries have historically been one of the top producers of European Union member states. The contribution of fisheries to the Danish economy is relatively low, around 0.5% of gross domestic product, yet many coastal communities depend on commercial fishing, especially those located in northern and north western regions.
- A1.180. The major Danish fisheries occur in the North Sea, the Skagerrak, the Kattegat and the Baltic Sea. In 2009, over 2,800 Danish commercial fishing vessels and over 2,500 people were engaged in fish harvesting. The pelagic and demersal fisheries are comprised of a variety of vessels, most of which operate in many locations and use multiple gear types. Vessels vary in size, with the largest vessels operating in the pelagic fishery and the industrial reduction fisheries for sprat, sandeel, pout and blue whiting. The smallest vessels, skiffs, target near-shore demersal species with gillnets. In 2007, the value of Danish landings was over \$450 million, 90% of which were under catch share programmes (55% in the ITQ-Pelagic Program and 35% in ITQ-Demersal Program).
- A1.181. Danish fisheries have experienced periods of booms and busts in landings and revenue. During the two decades preceding the ITQ management, Danish fisheries’ policies attempted to reduce capacity and curb overfishing through vessel decommissioning, and through policies limiting vessel entry and investments in vessels. Denmark’s vessel decommissioning used public funding to remove vessels permanently from the commercial fleet. From 1989 to 2006, 1,272 vessels were removed at a total cost of 1.4 billion Danish kroner (U.S. \$245.3 million). While a reduction in gross tonnage has been achieved with this program, efficiency has not increased and biological goals have not been met. From 1994 to 2002, overall catch and catch rates steadily declined, showing no evidence that the fleet reduction program led to increased catch opportunities. Perhaps most important, vessel decommissioning does not change the underlying incentives that lead to overcapacity, which often makes it a short-term solution for overcapacity in fisheries.

A1.182. Traditional fishery management approaches have resulted in overfished stocks and left coastal communities suffering from underperforming economies. Over the last two decades, there has been a concerted push in the Danish fisheries to create sustainable harvests with balanced, profitable fishing fleets. Policies have mostly focused on reducing capacity (by using public funds to decommission fishing vessels) and implementing effort controls to regulate fishing mortality (such as limiting days-at-sea and total kilowatt days per year). These two policies have been ineffective, yet the goals for the fisheries have remained the same.

A1.183. From 1989 to 2006, 1,272 vessels were decommissioned at a total public cost of 1.4 billion Danish kroner (US\$245.3 million). According to the government, this reduced gross tonnage but did not produce a corresponding increase in fishing efficiency nor did the decommissioning contribute to the rehabilitation of marine habitats or fish stocks.

Policy

A1.184. The Danish Ministry of Fisheries developed the ITQ Programmes in the pelagic and demersal fisheries to achieve the following goals: ensure that fleet capacity is in line with fishing opportunities, create a viable fishing economy, and benefit the coastal fisheries. While the ITQ Programmes were designed primarily to promote economic efficiency, they were also designed to support the coastal fishery (and those communities dependent on it), provide young fishers with the ability to participate, and indirectly reduce discards by removing excess capacity.

Rights Based Management

A1.185. Three different rights-based management systems are utilised in Denmark to manage its marine fisheries. These are: the ITQ system applied to the pelagic fisheries for herring and mackerel and to some industrial species (sandeel, sprat, blue whiting and horse mackerel); the VTQs (vessel transferable quota) that apply to the Danish demersal fisheries for cod, saithe, plaice, haddock, hake, sole, turbot, monkfish, Norway lobster, and prawns; and the Limited License system that is used for the Danish blue mussel fishery and the oyster fishery in the Limfjord.

A1.186. In 2003, the Danish government introduced an ITQ Program for the Danish herring fishery. In 2007, the system was extended to cover additional pelagic species. The pelagic and industrial vessels catch relatively cheap fish and are thus more dependent on efficient handling of large amounts of fish than the demersal fleet.

A1.187. At the same time, managers introduced a VTQ programme for the Danish demersal fisheries as a means to achieve economic, biological and social goals. Subsequently, this has been converted into an ITQ programme

- A1.188. Economic goals were a focal point of the ITQ Programmes, with objectives to balance fleet capacity with fishing opportunities, create economic growth in the fishery sector, and allow fishers to create long-term value-added investments in fishing operations. Biological goals focused on reducing discards in the fisheries. Specific design features were added to meet the social goals of the fishery, which included maintaining a competitive coastal fishery and improving entrance for young fishers.
- A1.189. A number of fishing areas are further subdivided into zones based on designations determined by the International Council for the Exploration of the Sea (ICES).

Eligibility

- A1.190. The two ITQ Programmes follow general principles regarding who can hold and fish shares, but each program has some unique features. In both, allocations are made to individual registered fishers to use on a registered fishing vessel. Thus, only active fishers can use the quotas on active vessels ensuring that benefits from operation accrue to those in fishing communities. To be eligible for allocation, fishers must have had more than 60% of their earnings come from fishing.

Allocation

- A1.191. Allocation is often the most contentious issue in the development of a catch share program, and this was no different in the case of the Danish fisheries. The industry was initially sceptical of ITQ management and thus a driving principle of the program was to ensure fishers broadly accepted the initial allocation of shares as being fair and a true picture of their historic performance.
- A1.192. The ITQs for pelagic fisheries were allocated using the grandfathering method, where the rights were given free of charge to fishers, using 2000-2002 as reference years. Individual vessel quota shares (VQS) for the 28 most important quotas were distributed to all vessels with a level of activity generating more than €30,000 of gross earnings each year in the reference period 2003-2005. Using the grandfathering method, VQS were allocated to each vessel based on landings in the reference period 2003-2005.
- A1.193. Allocation was based on weighted catch history from 2003, 2004 and 2005: Weights used were 20%, 30% and 50%, respectively. While this was fairly straightforward, fishers were allowed to appeal allocations to accommodate non-typical cases, such as those where the operator was unable to fish during the years used to determine catch history (e.g., due to sickness, damage to vessel, sale of vessel). A thorough appeals process was

fundamental to the system. Overall, fishers seemed satisfied with allocation process and outcomes.

Rights

- A1.194. The ITQ Programmes issue species-based privileges that allocate secure shares of the catch for specific species and area combinations. Each year, the shares are converted into actual weights that fishers can land based on the fisher's holdings and the species-area catch limits.
- A1.195. Managers also formed a system of quota set-asides to promote specific social goals including access for small vessels and new entrants. For the coastal fishery, shares of the most important demersal species, sole and cod, were set aside for use by vessels under 17 m. Vessels meeting this requirement can opt into the coastal fishery and will receive additional shares provided they stay in the coastal segment for three consecutive years at a time. In this period they may buy or lease quota shares from vessels outside the segment but are not allowed to sell any out of the segment. The quota set-aside is fixed, so the amount individual operators receive depends on the number of vessels that opt in.
- A1.196. Additionally, shares were set aside for a program called the Fish Fund. These shares are allocated to fishers to support new entrants, data collection and innovation, but have, to date, been mainly used to allocate quota to new entrants who make investments in vessels.
- A1.197. The Fish Fund and the ability for the government to revoke shares with eight years' notice help ensure that fish are recognized as a public resource, while still providing fishers with stability and security.

Transfers

- A1.198. Initially and in contrast to ITQs where the quota can be transferred independently of the fishing vessels, under VTQs the fish quotas (allocated on a 3-year historic record) and the vessels to which they are allocated were inseparable and only transferable together. However, a (new) vessel owner could transfer the quota utilization to another fishing vessel in his possession, and if there is more than one (new) owner the quota utilisation could be split among them and transferred proportionately to other vessels in their possession.
- A1.199. Fishers holding VTQs could form "quota pools" and through quota lease or swaps among pool members ensure efficient use of the pool's fleet capacity, and at the same time the discard related to individual quota limitations could be reduced. Since the inception of the ITQ system in Denmark, there have been at least 11 Danish Fish Pools in operation through which up to 80% of the share quota has been the subject of short term share transfer transactions. A main feature of the Fish Pools is that

members are not permitted to discard fish due to lack of quota as long as the pool has quota for that species. Fishers who exceed their quota can endeavour to lease their excess quota through the Fish Pool upon their return to the harbour. The result has been a substantial reduction in discards.

A1.200. Quota loans between fishing vessels outside quota pools were also permitted with some limitations.

A1.201. Both permanent and temporary transfers are allowed to support changes in industry structure, such as reduction in overcapitalization, and adjustments to variations within the quota year.

A1.202. Permanent transfers are handled by the government. Fishers register and obtain approval for the transfer from the Danish Directorate of Fisheries. If there are more than one buyer the quota can be split among the buyers and transferred proportionately to other vessels in their possession.

A1.203. Within the quota year, extensive swapping and leasing takes place. This is done almost entirely through Fish Pools, voluntary, privately-established groups of fishers that promote cooperation and coordination between quota holders. Fish Pools are managed by a "pool master," who must gain approval from the Danish Directorate of Fisheries, and each Fish Pool is responsible for ensuring that aggregate member landings do not exceed total quota shares. Fish Pools facilitate trading, especially annual leases within the season. Members of a pool group are free to swap, lease or lend their quotas within the group. Swaps between pool groups cannot be made, but 25% of annual quota can be transferred. Eleven pools are currently in operation and around 80% of all quotas have been brought into Fish Pools. Fish Pools facilitate temporary transfers between members and nearly all leasing is done through Fish Pools. A main feature of the Fish Pools is that members are not allowed to discard fish due to lack of quota as long as the pool has quota for that species. Fishers who exceed their quota can lease quota to cover their catch upon return to the harbour. The result has been a substantial reduction in discards.

Trading

A1.204. Fish Pools use an online system (www.puljefiskeri.dk) to conduct trades. The government does not actively participate in the trading market, but the Fish Pool system and private brokerages have combined to promote a well-functioning quota market. While fishers are provided yearly allocations based on quota holds, participation in a Fish Pool is one quota year plus one month. This is used to ensure that any overfishing can be accounted for in the following year.

Expiration

A1.205. Shares are allocated with no expiration date, but can be revoked by the government with eight years notice.

Inactive Vessels

A1.206. There can be various reasons for vessels to be inactive rather than being scrapped. For example until 2009, in order to be eligible for days at sea in relation to the North Sea cod recovery plan. The days at sea could then be transferred to active vessels.

A1.207. Inactive vessels also have transferable quota shares. These are not transferred to other vessels due to various legal restrictions on transfer possibilities to avoid concentration as well as restrictions related to primarily the North Sea cod recovery plan. However, these inactive vessels must be owned by active fishers. The vessels quotas allocated to these inactive vessels are transferred to other vessels, which land the fish.

Coastal Fishery

A1.208. The coastal fishery, a sector comprised of vessels under 17 m., has additional eligibility requirements for quota holders. Vessels can voluntarily enter this sector and in return receive additional quota shares of cod and sole, two of the most important demersal species. The quota set-aside is fixed at 10%, so the amount each operator receives depends on the number of vessels that join. Quota cannot be sold out of the coastal fishery, but operators in this sector can purchase additional shares from both coastal fishers and non-coastal fishers. Operators in this sector must stay in the sector for a minimum of three years, and the majority of their fishing trips must be fewer than three days in length. In every year since this feature was introduced, the coastal segment has experienced landings higher than their historical average. Out of 352 fishing vessels having joined the sub-programme in 2007, 340 were still included by April 2009. The share of (some) quotas belonging to vessels in the coastal programme increased during this period, indicating that fishing rights had been traded into the coastal segment.

Coastal Communities

A1.209. The Danish experience from introducing ITQ/VTQ shows no signs of development of a particular pattern in terms of geographical concentration of quotas. Esbjerg, once one of the biggest fishing communities in Denmark, has lost a significant amount of quota shares and vessels, while Thorupstrand, where they fish from the beach, is one of the fishing communities being most successful in acquiring quota shares. Neither is there any evidence of geographical concentration within regions in Denmark.

Less Active Vessels

A1.210. The less active – typically small scale vessels with gross earnings below € 30,000 in the reference period continued to be managed with a ration system with a fixed share of the national quotas for their segment. The total quota allocated to the group of less active vessels is calculated as share of these vessels fishery in the reference period (2003-2005).

Concentration

A1.211. Concentration limits are also in place to avoid excessive consolidation of shares. Concentration limits are higher for the industrial and the pelagic fishery where efficiency and large holdings are important, and they are lower in the demersal fishery, where operations are smaller and tied to local communities.

New Entrants

A1.212. Before introducing the ITQ Programmes, the Danish government clearly stated that a necessary consequence of removing overcapacity would be a reduction in the number of vessels and participants in the fishing industry. However, the government also said the fleets would have newer vessels that are able to carry high-quality fish and be more attractive for young fishers to work on.

A1.213. Providing opportunities for new entrants under 40 was an important program goal and there are three main ways in which the program accomplishes this. First, the shares are transferable and new entrants may purchase shares in order to participate in the fishery. Second, the Fish Fund is an initial set-aside of quota shares for new entrants who demonstrate an investment in the fishery, such as by purchasing a new vessel. Participants are allowed to access Fish Fund quota annually. The loan period is a maximum of 8 years. After 4 years the loan is reduced each year. In addition, new entrants are allowed (within some limitations) to buy quota from existing vessels without necessarily taking ownership of the vessel. The intention is that during the 8 year loan period (especially after year 4) the newcomer becomes well established and financially able to buy the quota needed under normal conditions. Finally, new entrants are allowed to join one Fish Pool and can access the pooled quota for a fee. These programmes have all supported the participation of younger fishers and fishers who did not receive initial allocations.

Other Management Measures

A1.214. In addition to the TAC/quota system, effort regulation is used to directly regulate the activity of individual fishing vessels. This is primarily to support the cod recovery plan in the North Sea, Skagerrak and Kattegat. The regulation determines the number of days at sea each fishing vessel is

allowed to operate, based on the fishing gear and mesh size used by the vessel. Days at sea are transferable. Some vessels only catch non-quota species and are accordingly not restricted by EU quotas.

Consolidation

A1.215. As a result of ITQs, the number of vessels holding ITQs has been substantially reduced. As an example 34 vessels took part in the North Sea herring fishery in 2008, compared to 84 in 2003. There has been new investment with vessels of more than 25 years old being replaced. In the Danish demersal fleet holding VTQs, the number of active vessels (vessels with registered landings) was reduced by more than 30% over two years. This resulted mainly from the pooling of vessel quotas. This has led to a good fit between the overall capacity of the active fishing vessels and the fish quotas presently available to Denmark, although some structural changes within and between the fleet segments would be required to make the fit optimal.

Quota Management

A1.216. The Danish ITQ Programmes require all landed fish to be deducted from participants' shares. In a separate action, Denmark introduced a pilot program entitled Catch Quota Management to achieve a complete accounting of all catches and landings through the use of electronic logbook registration, on-board cameras, and a monitoring system using electronic sensors. The 2008/2009 results revealed that, as a result of this new program, fishers fish more selectively to reduce discards and increase long term earnings rather than maximise short term profits by catching and then releasing lower value fish, many of which fail to survive following release and would have supported commercial fisheries if they had not been captured by virtue of their inherent contributions to marine ecosystems.

A1.217. In Denmark, the Catch Quota Management trials included a provision which required a multi-species fishery to stop fishing as soon as the quota for any one of the species was reached. This motivated the fishers to plan, select and innovate fishing practices and gear to fish selectively in order to optimise catches of each species of a multi-species fishery. To the extent that the fishers are unable to achieve the precise quota limitations, the flexible ITQ Catch Share Programmes permit trading or leasing of quota that increases the potential profitability as well as efficiency of each unit of fishing effort, eliminates or reduces a potential waste of natural marine resources and accommodates the fishers' need to refrain from exceeding (or endeavouring to reach, as the case may be) strictly enforced catch quotas.

Fleet Economics

- A1.218. The economic viability of the Danish fishing fleet improved significantly with the introduction of ITQs and VTQs. For the commercial fleet in total the profitability in 2007 was 20% (up from a 9% average for the years 2004–2006). The increase was realized in spite of an overall 7% reduction in the Danish quotas for fish for human consumption from 2006 to 2007, and a 25% reduction in the quotas for fish for fish meal and oil.
- A1.219. For all VTQ vessels the profitability increased in 2007 when compared to the previous 3 years' average, and for some segments (e.g. demersal trawlers above 18 m) the increase is more than 50%. However, the consolidation process led debts in the sector to increase considerably.
- A1.220. Under the ITQ Programmes, the capacity in Danish fisheries has been reduced by 25% without the use of public funds for decommissioning. Profits have increased from 9% – 20% and fishers have doubled new investments in value-added efforts, rather than in catch maximization technology, which fuels the race for fish.
- A1.221. The coastal fishery has increased its shares of the catch, indicating success for coastal communities.

Monitoring

- A1.222. In 2010, Denmark (along with the U.K., Sweden, Holland and Germany) planned, and partially implemented, a CQM program for nearly 70 vessels. The CQM program requires all catches, including discards, to be registered by weight in an electronic logbook and counted against the vessel quota. In return, operators receive additional quota to reflect the decrease in uncertainty surrounding catch. To participate in the programme all catches including discards are monitored by cameras and sensor systems through an electronic monitoring system.
- A1.223. The Danish CQM trials in 2010 dictate a mixed fishery to stop when one species in a multi-species fishery is exhausted. The effect is that biological targets for the individual stock are not overshoot – as may be the case in the quota basket and the weighted transfer models. The effect in relation to the utilization pattern is that fishers will plan, choose and innovate fishing methods to fish selectively to optimize catches on each species in the mixed fishery. To the extent they cannot decide on the precise catch composition, the flexible ITQ Programmes will allow swapping or leasing of quota to cover their needs.

Denmark: Oysters & Mussels

Right Based Management

- A1.224. Limited licences were issued to manage oysters and mussel dredging in Limfjord, Kattegat and Wadden Sea. The blue mussel fishery is a single species, single fleet fishery. The fishery is supplemented by smaller catches of oysters and cockles. The mussel fishery is managed on exclusive entry licenses including clear specification of the capacity of the vessels. Catch limits per vessel per time period are applied to avoid a decline in quality when water temperature increases. In the Wadden Sea the fishery is managed through a tri-national agreement; whereas the fisheries in the Limfjord and Kattegat/Small Belt areas are managed at a national level.
- A1.225. The main management instruments used were vessel entry restrictions, capacity limitations (expressed in terms of engine power, length, breadth, draught, and tonnage), and individual quotas. Fishing on Sundays is also prohibited. There is a strong element of co-management through direct involvement of the fishers in the management of the fishery. The LL system was introduced with the aim of promoting stock conservation and economic efficiency in the (specialised) fleet segments.
- A1.226. In 2009, the Danish blue mussel fishery also came under de facto ITQ management, leading all Danish commercial marine fisheries to be managed through an ITQ system.

Allocation, transfer and trading of rights

- A1.227. No TAC is set for the mussel fishery. The fishing capacity restrictions are sufficient to restrict effort to a level ensuring a biomass above critical biological limits and good level of economic viability. The fishers themselves decide the number of fishing days, during which the season is determined by the daily and weekly quotas, and the fishers choose when the season will start and when it ends. LL is allocated on application and based on historical track records. Transfer of rights takes place by purchase / takeover of a licensed vessel.

Concentration

- A1.228. The number of licences is more or less fixed but the long term policy aims to reduce the number of licences in order to reduce fishing pressure.

New Entrants

- A1.229. There is restricted access for newcomers as the number of licences is restricted. A vessel with a licence may be available on the owner's death or retirement. It may typically be taken over by an heir or a long-term crew member. The demand for access is medium to high.

Iceland ITQ

Background

A1.230. Prior to the introduction of the ITQ system in the late 1970s, Iceland practiced a wide range of fisheries management systems. These included access licenses, fishing effort restrictions, investment controls and vessel buy-back schemes; none of which achieved the objective of sustainable fisheries.

Policy Objectives

A1.231. The main objective of fisheries management in Iceland is to promote conservation and efficient utilisation of exploitable marine stocks and thus ensure stable employment and settlement throughout the country. The Icelandic parliament lays, by legislation, the fundamental rules to base the fisheries management upon. In Iceland various methods are used for effective management of fisheries. These include allocation of fishing permits and ITQs, regulations on types and configurations of fishing gear and fishing ground closures.

Vessel Licenses

A1.232. No one may pursue commercial fishing in Icelandic waters without having a general fishing permit. General fishing permits are of two types; a general fishing permit with a catch quota and a general fishing permit with a hook-and-line catch quota. A vessel may only hold one type of fishing permit each fishing year.

A1.233. Vessels holding fishing permits with hook-and-line catch quotas may fish those species for which they hold quotas plus species which are not subject to TAC limits. There are rules on allowable by-catch. Hook-and-line catch. Quotas may only be used for longline and hand-line fishing. Hook-and-line boats are permitted to fish for benthic species using such fishing gear such as ploughs and traps and to use nets for lumpfish fishing.

A1.234. All commercial fishing operations are subject to a permit from the Directorate of Fisheries. In 2007, the Directorate issued 1,332 fishing permits to vessels and smaller boats. Certain fisheries require special permits, such as Danish seining, inshore shrimping, specific fisheries by Icelandic vessels in distant waters as well as the fishing of foreign vessels within the Icelandic EEZ.

Property Rights

A1.235. The exploitable marine stocks of the Icelandic fishing banks are the common property of the Icelandic nation. The allocation of harvest rights provided for by this Act neither endows individual parties with the right of ownership nor irrevocable control over harvest rights.

Rights Based Management

History

A1.236. The early experiences led to the first ITQ system being introduced into the herring fisheries on the extension to a 200 mile EEZ. Since then, the system has been extended in several steps. In 1984, a limited form of ITQs was introduced in the demersal fisheries. In 1991, a uniform and fairly complete ITQ system was adopted in all Icelandic fisheries, applying to all vessels above a specified minimum size. In 2004, the system was expanded to cover all commercial fishing vessels. Currently, the system comprises 25 fish species and about 35 different fisheries.

A1.237. In the case of the trawling sector, larger vessels were brought into the fisheries as quotas were transferred from less to more efficient vessels owned by the same fishing company. Open boats were initially excluded from the system; this led to a significant increase in the number of small vessels and in 1991 the number peaked at 1,325 vessels with a share of more than 20% of the cod catches. Through time more stringent restrictions have been implemented. In 1991, open boats were incorporated into the system; vessels under 6 GRT are in the main ITQ system, a special ITQ system for small boats, or a trip-limit fishery. As a consequence in subsequent years their number reduced, so in 2004 it was just 60 % of its peak their decline in numbers has been on-going ever since.

Annual Quota

A1.238. The Directorate of Fisheries issues annual catch quotas (kgs) to individual vessels as a share in the TAC set every year for each species. The annual catch quota is based on the IVQ share (%) that remains unchanged from one year to the next. Quota species represent about 95-97% of the total annual catch value. Fishing rights can be either general catch quotas, catch quotas for hook and line boats (max 15 GT) or fishing days.

A1.239. Day-trip longline vessels, which bait their lines on shore, may land 16% in excess of the catch of cod, haddock and wolffish calculated as part of their catch quotas. The longline discount for cod is limited to 3,375 tonnes of ungutted cod, which shall be distributed over the fishing year in four three-month intervals from 1 September on a pro rata basis, taking into consideration the cod caught by longliners in 2002.

Duration

A1.240. The Icelandic ITQ system allows for transfer of QS and QP. The QS ownership is tied to a vessel, granted in perpetuity, and perfectly divisible.

Transferability

A1.241. To ease the transferability of catch quotas, each quota is calculated in "cod equivalents." A cod equivalent is a weight measurement based on the value of a species in proportion to the value of gutted cod, where gutted cod has

a value of one. Because they are based on the market value of the fish, cod equivalents fluctuate considerably from one fishing year to the next. The Ministry of Fisheries publishes the cod equivalents for each fishing year.

A1.242. The quota share of a vessel may be transferred wholly or in part, provided that the transfer of a quota share does not result in the harvest rights of the receiving vessel becoming obviously in excess of its fishing capacity

A1.243. If a vessel which has a commercial fishing permit is to be sold to a vessel operator resident in another municipality than the vendor, the municipal authorities in the vendor's municipality shall have first option to purchase the vessel. Municipal authorities that purchase must at once offer vessel operators resident in this municipality the possibility of purchasing the vessel and publicly solicit offers to purchase.

A1.244. Vessels may fish in excess of their catch quota for individual demersal species, with the result that their catch quota for other demersal species will be reduced in proportion to the relative value of each species. This authorisation is limited to 5% of the total value of the demersal quota, and the excess catch of each demersal species may not exceed 2% of the total value of the demersal quota.

A1.245. Up to 20% of catch quotas for each demersal species and catch quotas for deepwater shrimp, nephrops and herring, 10% of catch quotas for scallops and 5% of catch quotas for deep water shrimp may be transferred from one fishing year to the next.

A1.246. Vessels may also fish up to 5% in excess of the catch quota for each demersal species, herring and deepwater shrimp and 3% in excess of their catch quota for offshore shrimp and scallops with the result that the excess catch will be deducted from their allocated catch quota for the following fishing year.

A1.247. There are special conditions for vessels less than 15 GRT, which is the legally defined limit for a small vessel. One condition is that quota can be transferred to the small vessels from vessels larger than 15 GRT, but not the other way round.

Non-Quota Landings

A1.248. A skipper may decide that part of the vessel's catch shall not be included in its catch quota up to a maximum of 0.5% of pelagic catch and 5% of other marine catch each fishing year. The catch must be kept separate from the vessel's other catch and weighed and recorded separately. The catch is sold at an approved fish auction market and the value obtained deposited in a fund for marine research. The vessel operator receives 20% of the

value of the catch sold, to be divided between the vessel operator and the crew in accordance with relevant agreements thereto.

Consolidation

A1.249. There are measures in place to prevent excessive consolidation where a small number of fishing companies dominate the fishery. No one owner, or closely-linked group of owners, is allowed to own more than 12% of the catch quotas for cod, 20% of the quota shares of Greenland halibut, saithe, and a haddock or 35% of the redfish quotas. In addition, a single company may not own more than 12% of the value of the combined shares of all of the species with TACs.

Loss of Rights

A1.250. Should a fishing vessel catch less than 50% of its total catch quota, measured in cod equivalents, during two consecutive fishing years its quota share shall be cancelled and the quota shares of other vessels in the species concerned increased accordingly.

A1.251. Should a vessel be prevented from fishing for six months or more of a fishing year due to damage or a major breakdown, the catch of that fishing year shall not result in the cancellation of its quota share.

A1.252. The operator of a vessel lost at sea retains its catch quota when allocation is made at the beginning of the next fishing year or fishing season, provided its quota share has not been transferred to another fishing vessel.

Other Management Measures

A1.253. In addition to the ITQ system, Icelandic fisheries management includes many other management measures such as area restrictions, fishing gear restrictions, and the use of closed areas to conserve important vulnerable habitats. Extensive provisions are made for temporary closures of fishing areas to protect spawning fish from all fishing. These measures are all meant to support and secure the sustainability of the fisheries.

A1.254. Effective control and enforcement is inseparable part of the responsible fisheries management. The directorate of Fisheries monitors Icelandic fisheries closely to ensure that all rules are being followed. Iceland has one of the most sophisticated enforcement regimes in the world, in particular regarding port control and weighing of all catches. According to Icelandic law, discards are prohibited. All catches must be landed.

A1.255. Scientific research is essential for successful management as extensive knowledge of the ocean around Iceland and its ecosystem must be the foundation regarding decisions on sustainable fisheries and other utilization of the natural resources of the sea.

Community Support

- A1.256. Over the years there has been some debate on the effect is of quota trading per se on the fortunes of fishing communities. Studies have not identified any particular patterns or trends. Prior to the changes of 1991, there was uncertainty as to the future and scope of ITQs and the quality of the property rights they bestowed. Iceland's ITQ system is considered to marginalize fishing communities that have depended on fishing and fish processing for centuries. With larger, more efficient vessels has come the ability to process at sea, putting many land-based processors out of business. Also, those who worked as contract fishers have found fewer employment opportunities with the switch to a large-scale fishery.
- A1.257. From 1991 lack of safeguards in place for small-scale vessels meant quota holders were free to sell their quota, and many small-scale holders did so. This had some unintended consequences. Communities and investment had developed around the fishing activities of these small-scale vessels. The loss of small-scale vessels meant that linked industries suffered. While small-scale vessel owners profited from selling quota, other stakeholders were left with no livelihood and mortgages on assets which then held little to no value. The best estimate available of this employment loss across the entire Icelandic fishing industry was 33%, a decrease from 6,200 jobs in 1991 to 4,200 in 2008.
- A1.258. To combat these negative impacts, the government instituted community quotas in 2002. Community quotas were introduced in Iceland in 2002 to address some of the criticism of the ITQ system; specifically the effect of quota consolidation in larger communities resulting in migration of people away from smaller communities. Under community quotas a small part of the TAC is given to about 20 small fishing communities on an annual basis. Their introduction was highly controversial and led to legal problems as the allocation was based on a formula of employment, fisheries dependency and whether quotas have initially been transferred from the area despite their being no legal provision for them. The Minister decides if the allocation will be made and how. The regulation on the distribution of community quotas was reviewed in 2007. Until then the communities themselves decided who would gain a quota and this led to some conflict; changes were made to allow the allocation process to run smoother, with communities, and not vessel owners, being supported.
- A1.259. Another measure adopted to support local fishing communities was the setting of quotas for longliners having their lines prepared on-shore 16 % higher than for those who do not. The aim was to support the longlining sector due to its sustainability credentials while maintaining local onshore jobs in local communities.
- A1.260. Harvest rights amounting to up to 12,000 mt of ungutted demersal species, which may be used: to offset major disturbances which are anticipated

because of sizeable fluctuations in the catch quotas of individual species; and for regional support through allocations to: smaller communities which are facing difficulties due to downturns in fisheries and which are dependent upon demersal fishing or processing; to communities which have suffered unexpected cutbacks in the total catch quotas of fishing vessels operating from and landing their catch in the communities in question, which has had a substantial impact on the employment situation in these communities. Catch quotas as provided for in this point may be allocated for up to three years at a time. These harvest rights are divided among species in proportion to the TAC of each individual species before being allocated on the basis of quota shares. The transfer of harvest rights allocated is not allowed, but exchange of equivalent harvest rights in cod-equivalent terms is authorised. Benefitting fishing vessels must land for processing within the community concerned catch amounting to double the cod-equivalent of the harvest rights allocated to them.

New Entrants

A1.261. Iceland does not have a special scheme for new entrants; Icelandic citizens have a general right to obtain a fishing license on demand, but newcomers have to either permanently buy or temporarily lease a quota to be able to fish. The “community quotas” may facilitate new entrants.

Fleet Economics

A1.262. The fishery’s increased efficiency is apparent in the decreased number of vessels in the fleet. Between 1990 and 2006, the total number of vessels decreased by 28%, however, this was not the case initially. Early ITQ regulations excluded small vessels leading many fishers to downgrade, switching to smaller boats to maximize their catch. Between 1980 and 1984, the number of small vessels jumped from 518 to 825. By 1991, there were 1,325 small vessels and these boats accounted for more than 20% of the total cod catch, compared to 5% of the cod catch in 1983. Over time, however, the Icelandic fishery has come to favour large trawlers.

A1.263. The economic performance of the Icelandic fishing fleet improved significantly with the application of the full-fledged ITQ system; annual net revenues in the demersal fleet (all segments) ranged from 13 % to 19 % during the period 2001–2007, leading fisheries to be among the most profitable economic sectors in Iceland.

Resource Rent

A1.264. While the fishing industry and the large-scale operators in particular, welcomed ITQs and the improved financial performance, many people had issues with the allocation of fishing rights and the distribution of the associated wealth. Many Icelanders felt that they have lost definitively what used to belong to them.

A1.265. To compensate society and following improved financial performance, in 2004 the Government introduced of a “resource fee” and this was fully implemented in 2009 at a rate of 9.5%. The fee accrues to the National treasury with no strings attached. In effect it redistributes the resource rent from the direct beneficiaries (vessel owners) to society in general. An option considered was that a percentage of the quotas be returned annually to the State which would then in turn allocate it through an open auction.

Figure 2: The Current Fisheries Resource Tax

Box 4. The current fisheries resource tax

The current resource tax was introduced by Parliament in 2002 and replaced levies that previously financed the Fisheries Development Fund (*Próunarsjóð sjávarútvegins*) and a levy for monitoring and surveillance. The tax is levied on all species. The effective tax is calculated in such a way that it depends both on the amount of quota held by the fishing firm as well as its economic performance. The reference period is the 12 months to 30 April in the preceding calendar year. The total catch value for that year is calculated and fuel, wages and other operating costs are then deducted. The total tax revenue for that fishing year equals 9.5% of this amount. The tax is then calculated per cod-equivalent by dividing total tax revenue by the catch on cod-equivalent kilos. This results in a tax per cod-equivalent kilo that is levied for the next fishing year.

A demonstrative example

Total catch value May-April 2010-2011	100 billion ISK
Wages (39.8%)	39.8 billion ISK
Fuel	10 billion ISK
Other operating costs	24 billion ISK
Base for tax	26.2 billion ISK
9.5% of base	2.49 billion ISK
Catch in cod-equivalent kg	450 million kg
Tax on cod-equivalent kg for fishing year 2010/2011 (ISK/kg)	5.53 ISK/kg

In this way the tax paid takes account of fluctuations in the profitability of the industry as well as the amount of quota issued the year before. The tax is paid for all catches. Hence, if the quotas are increased from last year, firms pay the tax per kilo on the increase as well. In the same way, if quotas are reduced, firms pay the tax for fewer kilos. In this way the taxation takes into account fluctuations in the catch between fishing years.

Source: Haraldsson & Carey

A1.266. A recent report concluded that “The efficiency of this system could be under threat from potential policy responses to the perceived unfairness of quotas having initially been given away and by Iceland’s possible accession to the EU. However, there is nothing the government can do now to do undo the unfairness of the initial allocation. Nevertheless, it could be attractive to increase the special fisheries resource rent tax as it is likely to be a more efficient tax than most others, although the increase should not be so great as to damage the fisheries management system. The resource rent could also be increased by reducing TACs from the current, biologically sustainable level to the level that maximizes rent. Provided that Iceland is able to negotiate to maintain the authority to set TACs and to keep the ITQ

system, joining the EU, and hence the Common Fisheries Policy (CFP), should not reduce the efficiency of the Icelandic fisheries management system”.

Ireland – Capacity Based

Vessel Catch Limits

A1.267. There are no ITQs in Ireland. Rights are capacity-based. In addition, quota is under the ownership of the state, so if for any reason vessels do not catch their quota, the quota is returned to the state for re-allocation. An operator does not own the monthly allocation and is not entitled to trade in, or carry over any entitlement within or between reference periods. The opening and closing of fisheries, and other controls and conservation measures are controlled by the national government.

Fleet Sectors

A1.268. Restrictive licensing is used to limit access to some fisheries, or manage it more closely. It is a form of secondary licensing additional to the primary fishing licence. For example, new proposals for lobster fishing may include lobster vessels but exclude licensed vessels with no track record in the lobster fishery.

A1.269. There are four main fisheries operating under Vessel Catch Limits in Ireland. By far the most significant is the small boat fleet of multi-gear vessels fishing for Monkfish, megrim, haddock, whiting, cod, Nephrops, in the Celtic and Irish Seas and further offshore in the Atlantic. Other fleets include beam trawlers in the Celtic and Irish Seas, and distant water pelagic trawlers targeting mackerel, herring, horse mackerel, etc. The target species of these fisheries are all high pressure stocks of moderate value and include species that range from mobile (Nephrops) to migratory (herring).

Access

A1.270. Access to Irish fisheries is determined by the fleet segment in which a vessel is registered.

A1.271. Each of the fishery segments has a cap on capacity i.e. capacity in terms of GT and kW for the individual segments must not increase. As capacity must be bought on a 1:1 basis, if someone wants to enter any of the sectors, a share of the total capacity of that sector (in terms of vessel tonnage (GT) and power (kW)) must be purchased from other vessel owners. The State does not control or administer these transactions. The price of capacity varies between fishery segments and is determined by tonnage (GT) and engine power (kW). The vessel is then entitled to remove fish up to its allocated quota.

Allocation

A1.272. The National quotas for pelagics are shared between vessels on the basis of a factor which is fixed according to historic track record and size of vessel. In other words, vessels in the pelagic sector receive fixed quota allocations according to their individual factor. Individual vessels' quota allocations are therefore guaranteed as a fixed proportion of the national quota. In the event that a vessel does not catch its quota, then that quota is retained by the state (and re-allocated to other vessels mainly on the basis of the factors but with some peripheral negotiations possible).

A1.273. Whitefish quotas are based on entitlements based on the size of the vessel and the type of gear in use. Before the introduction of pelagic refrigerated seawater vessels, some dry-hold vessels held quota entitlements for herring and mackerel. As a result, the polyvalent fleet has retained quota for these species. For example, a fixed allocation of 7,000 tonnes of the Irish pelagic quota of mackerel is allocated to the polyvalent segment annually. Of this 5,500 tonnes is set aside for vessels 'over-65 ft. registered length' with an 'active pelagic entitlement'; the balance is allocated to vessels less than 65 ft. registered length. In addition, dry hold vessels under 65 ft. RL have an entitlement to fish herring and mackerel from the polyvalent allocation (1,500 tonnes). This quota is for set periods in consultation with industry. Therefore if dry-hold, polyvalent capacity for an under-65 ft. RL vessel is bought, there is an automatic entitlement to fish herring and mackerel against this allocation. On the other hand, for over-65 ft. RL vessels, the entitlement to quota for herring and mackerel is restricted to capacity that already has an active track record for these species. In other words, if you wish to buy over-65 ft. capacity in the polyvalent segment and obtain an entitlement to pelagic quota, that capacity must have a track record of catches of herring and/or mackerel.

Transferability

A1.274. Many of those holding fishing rights in Ireland do so because of a historical track record of fishing. Those wishing to adjust their fleets or leave the industry can do so without financial loss by selling capacity to fish, measured in terms of the tonnage and power of their fishing vessels. This marketing is by private arrangement. If a vessel owner scraps a vessel, that capacity then becomes available, so a replacement vessel can be built and enter the segment providing the replacement capacity in terms of GT and kW does not exceed the scrapped capacity. Once the capacity has been bought, the licence to fish is automatic; vessel owners are able to renew their vessel licences unless the DAFF decides that stronger control of the fleet is necessary.

Concentration

A1.275. Avoiding the concentration of fishing rights in the hands of a few large companies is a key issue for Ireland.

Monthly Quotas

A1.276. Representatives from DAFF meet monthly with the Sea-Fisheries Protection Authority and industry representatives to agree on a quota for TAC species the following month. Subsequently, catch limits are published in Fisheries Management Notices for categories of vessels, e.g. 'boats greater than or equal to 55 ft. in length', 'boats using Scottish fly seines', etc. Vessels within each group may catch up to, but may not exceed the amount specified.

Non-quota Species

A1.277. Catches of non-TAC species are mostly limited by capping overall effort in each fishing segment and, consequently, on individual vessels.

Fishing Communities

A1.278. Regulations for licensing of fishing vessels give explicit recognition of the social and economic rights of coastal fishing communities. Monthly allocations of quota are often different for vessels under and over 55 ft. registered length (16.76 m.) in order to protect the rights of smaller vessels.

New Entrants

A1.279. Newcomers to the fishery must buy in capacity to fish. They must also be able demonstrate to the licensing authority that the capacity that they wish to take up has been removed from the fleet segment.

Ireland: Inshore Sector

A1.280. The inshore fisheries sector, comprising the vast majority of registered vessels in the Irish fleet, is critically important to coastal communities, offering employment in remote, inaccessible areas that see little commercial traffic travelling towards their villages.

A1.281. As a majority of the species fished are not governed by EU quota, it is Ireland's task to deliver responsible and effective management. Notwithstanding, no such regulatory system is in place, and without the imperative to curtail annual landings, many shellfish stocks were close to over exploitation.

A1.282. To address this situation, a Shellfish Management Framework was launched in 2005 to assist all stakeholders to work together to produce tailored management plans to ensure the future sustainability of inshore

stocks, designed to provide an integrated co-management structure. Today, however, many stocks remain fully exploited and catch rates have declined to a level that is adversely affecting the economic viability of the fleet.

- A1.283. This scenario was summed up in a study conducted in 2006 on the status of the Irish seafood industry, known on every quay wall as “the Cawley report”. It finds: “The traditional preoccupation with the off-shore sector and the lack of a clear, coherent resource management policy, is threatening the sustainable development of the inshore sector, coupled with the lack of State resources, both in administration and enforcement”
- A1.284. Community (local) catch quotas (CQ) operate in some of the inshore shellfisheries such as oyster and scallop. Here the management of the fishery is devolved to a local co-operative or other identifiable group but the group must have a management plan for the fishery to obtain these devolved powers. Usually the group will determine a global quota to be taken from the stock they manage and also individualise it and put other restrictions including day limits, seasonal closures etc. The group has powers to restrict access and define the number of licences. In some cases these licences have been transferred privately between individuals. In other cases private transfer is not allowed.
- A1.285. For many, the inshore fisheries sector (boats under 15 m., operating largely within 12 miles of the coast and fishing, mostly, for non-quota species, and more-often-than-not with pots) is for many the forgotten sector. And yet, its scale and importance to peripheral communities was really only fully explored with the publication, in 1999, of the BIM report Irish Inshore Fisheries Sector – Review and Recommendations.
- A1.286. Four national Species Advisory Groups (SAGs) for lobster, crab, shrimps and molluscs were established on the basis of co-management. The SAGs brought together regional industry representatives, BIM, the Marine Institute, the SFPA and the Department. This structure also anticipated the formation of Local Advisory Committees (LACs) led by industry and facilitated by BIM. If SAGs provided national co-ordination, LACs would provide a local arm and truly empower local fishers.
- A1.287. The most active SAG, lobster, drew up and agreeing a new, national, management regime for lobster. The proposal included for the first time, the introduction of managed access.
- A1.288. It has not been implemented. Progress has been slow as in light of the judgement of the European Court of Justice against Ireland concerning non-compliance with the EU Habitats and Birds Directives, the overriding priority for this sector continues to be to bring all inshore fisheries (and

aquaculture) in Natura 2000 sites into full compliance with the EU Birds & Habitats Directives. The Habitats Directive requires that any project or plan be subject to appropriate assessment before any consent or licensing decision is made. At the time of the Lobster Plan proposal, it became clear that the proposed Plan would have required such an assessment before any management arrangements were put in place.

A1.289. In a recent debate of the House of Oireachtas Fishery Sub-Committee representatives of many stakeholders made a large number of points on the management of Irish inshore fisheries. Given the potential relevance of these comments to a similar debate in Scotland, the following are some of the identified comments.

- Sustainable management and regulation is the key to ensuring a healthy inshore fishery in Ireland. Sadly, this has been lacking to date.
- Ireland has a significant amount of autonomy when managing its inshore fisheries and is not constrained by TACs for most of the mollusc and crustacean species found in inshore waters. Inshore fisheries should be given the required support to expand sustainably to support coastal and island communities.
- It is estimated that more than 80% of Ireland's fishing fleet operates inside the 12-mile limit. The inshore sector, which concentrates in the main on crab, lobster, shrimp, scallops, whelk, razor, cockles and Atlantic salmon, carries out its activity within the six-mile limit.
- The number of registered vessels has grown substantially since 2005. This has been driven to some extent by the scheme for the licensing of traditional pot fishing boats in the Irish Inshore fleet.
- We need to place a proper value on the significance of inshore fisheries in Ireland for the fishery itself and for those who rely on it for a living. Coastal communities do not have the same employment opportunities as those in urban environments and have limited potential for economic diversification.
- Most of the crews on the whitefish fleet and the inshore fleet are made up of non-nationals because the job is not sufficiently attractive for Irish crews to get involved. The fishing industry is unique in that the profession cannot be learned in school or college and has to be learned first-hand. If, as has happened for a number of years, the younger generation is not going into the industry, it will die and we will be preserving stocks for nothing.
- We have licences that are constantly diluted, which devalues the licences. We lost our mackerel entitlement to a handful of people. We lost our herring entitlement to 18 boats in a particular county. Is that good for coastal development?

- Larger boats have the privilege of going after many species into deeper water and can also come inshore. That is an issue that needs to be examined and preserved for smaller fisheries.
- The closure of the Dunmore East box to boats in excess of 18 m has proved to be hugely beneficial and that initiative should be extended around the coast to different species and bays. For example, trawling in bays for sprats should be protected for small boats which do not have the capacity to go further out to sea.
- Let us consider the herring situation in Dunmore East and the central fishery. One could give three boats the quota and it would be gone overnight or one could give it to 50 small families in a way that supports our local communities.
- We believe island communities should have licences designated for use on the islands. If a young person wants to stay on an island he or she should have the possibility of getting a licence to try to see whether he or she can make a go of it. Such people should be able to try it out perhaps for two years. Then, once they make a go of it, the licence should go back to the community where it could be used again. There are many barriers to entry in the fishing industry. We believe this must be done because at the moment we are always planning for the short term. However, we should consider what it will be like in 30 years' time. The question is who we want to be fishing on the islands and that is what we should be planning for now.

Faeroes ITQ

Background

A1.290. In the beginning of the 1990s the Faroe Islands experienced catches at a historically low level from the most important demersal fish stocks. This fostered a severe economic crisis in the fishing industry. As the regulation of the fishery was based on the use of technical regulations only (closed areas and mesh sizes), it was decided to introduce a more effective fisheries regulation.

Rights Based Management

A1.291. An ITQ management system was introduced in 1994 for vessels of 20 GT and above whereas the smaller coastal fishing vessels would be fishing on a general annual quota. This system was met with much reluctance from both the fishing industry and a number of politicians and caused a substantial revision of the Commercial Fisheries Act.

The Scheme

A1.292. The main elements of the RBM managements system applied in the Faroe are:

- a capacity policy which limits the size of the fishing fleet to the 1996 level;
- a grouping of the fishing fleet into vessel segments based on size and type;
- the allocation of individual and transferable rights to the industry by means of a dual license system comprising (i) catch permits which follow the individual vessels and outline the capacity for the vessel groups and (ii) fishing permits that are used for management of fishing patterns. The permits include the number of days at sea, which are used to regulate the catch of demersal species such as cod, haddock and saithe on the Faroe Plateau.

Rights

A1.293. The regulation sets the number of days at sea that each individual vessel is allocated for a specified fishery. The number of days is regulated each year in a process including both scientific advice and advice from the industry; Technical regulations, including gear regulation and minimum size limits, and a system of closed areas regulating the admittance of the different vessel segments; By-catch quotas are used to regulate the fishery in the zone outside the Faroe Plateau.

New England Groundfish

Background

A1.294. The Magnusson Stevens Act (1976) (MSA) is the primary law governing marine fisheries management in US federal waters. It amended in 1996 (Sustainable Fisheries Act (SFA)) to mandate Federal government to stop overfishing, rebuild all overfished stocks, minimize by-catch and protect essential fish habitat. In 2006, the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSRA) was passed, updating the original Act (MSA) and the SFA. Objectives of the original act included the need for to conserve and manage US fishery resources, to promote fishing under sound conservation and management principles, and to provide for the preparation and implementation, in accordance with national standards, of FMPs which will achieve and maintain, on a continuing basis, the optimum yield from each fishery.

Rights Based Management

A1.295. The New England groundfish fishery is currently engaged in a transition to sectors. Sectors are voluntary cooperatives of groundfish permit holders that receive group allocations of groundfish quota based on the combined catch history associated with the groups' permits. The sectors have been required to develop operations plans and self-administer their quota share, and are scheduled to begin operation in May 2010. After consideration of a variety of options to meet strict rebuilding deadlines under the MSA, sectors

were chosen by the New England Fishery Management Council (NEFMC) in Amendment 16 to the Northeast Multispecies Fishery Management Plan (FMP).

- A1.296. In 2004, a group of hook fishers on Cape Cod formed the Georges Bank Cod Hook Sector. For the previous decade, Cape Cod hook fishers were suffering as cod stocks were declining and the existing days-at-sea management regime was severely restricting their ability to access fish and run profitable businesses. Due in part to the nature of hook fishing (specifically, the ability to selectively target fish), fishers proposed a different approach to managers: In return for a secure annual share of the overall catch, sector fishers would guarantee that they would not exceed the catch limit. Sector goals were to increase fishers' flexibility and profits, stop wasteful discarding of fish and ensure the future of hook fishers on Cape Cod.
- A1.297. In 2006, a second sector, the Georges Bank Cod Fixed Gear Sector, was developed and implemented to provide similar opportunities to gillnet fishers. Under the sector programme, fishers work collectively to harvest a combined annual quota of fish.
- A1.298. The two sectors have provided substantial benefit to the fishers and the fish stocks. Under sector management, hook and fixed gear fishers have stayed within their catch limit. In 2009 alone, they were able to land nearly 450,000 pounds of codfish they would have been forced to discard under previous rules. Without the sector programme, many fishers would have likely gone out of business. The biggest challenge for fishers was to shift from competing with other local fishers to cooperating with them and managing their collective share together. The sectors have a local manager who works directly with the fishers to ensure they comply with the sector catch limit while maximizing their collective goals.
- A1.299. The key changes included in the MSRA were a firm deadline to end overfishing by 2011. Tools to be implemented to achieve this were: Annual Catch Levels (ACLs) and a Limited Access Privilege Program (LAPP) provision. The former must be set at or below the Acceptable Biological Catch (ABC) of the fishery as recommended by the Scientific and Statistical Committee (SSC), and the ACL cannot exceed the SSC's recommendation for ABC. In addition Accountability Measures detail what actions will be taken in the event of an overage of harvest level.
- A1.300. LAPPS are limited access systems whereby federal permits are issued to harvest a quantity of fish representing a portion of the TAC. The term, limited access privilege program, has recently been used in place of the terms, Individual Fishing Quota and Individual Transferable Quota, since

this new term encompasses both individuals and communities who may be eligible to receive an allocation of a portion of the TAC or commercial quota. The reauthorized Magnuson - Stevens Act specifies three types of LAPs; individual fishing quotas (IFQs), community quotas, and quota held by regional fishery associations (RFAs). Although the MSRA only mentions these three types of LAPs, LAPs can be given to a broad range of entities as long as they meet the eligibility requirements. These entities could include partnerships, corporations, co-operatives, and fishermen's organizations.

- A1.301. In 2010, the sector model was expanded with implementation of the Northeast Multispecies Sector Management Program. Now, at least 98% of groundfish will be landed under 17 voluntary sectors in ports throughout New England. The goals of the sector system are explicit: Harvest within proscribed limits; Increased harvest of under-utilized stocks; Reduce discards; Permit ACE trading to allow the fleet to balance quotas and prevent premature shut down; and Reduce fishing effort on over exploited stocks. Sectors work with a "hard" TAC i.e. a fixed catch based on scientific recommendations for individual stocks. Individual vessels are allocated a % of the established TAC and these are grouped together in sectors. There are regulations on discards. Sector vessels cannot discard any legal sized groundfish of allocated stocks, including legal sized unmarketable fish. Vessels may not retain catches of stocks that are categorised as over fished.

Fishery Management Plans

- A1.302. In 1977, the New England Fisheries Management Council produced its first fisheries management plan. This covered cod, haddock and yellowtail flounder. Management measures included annual quotas, trip limits, minimum sizes and gear restrictions.
- A1.303. In 1986, the New England Multi-Species Fisheries Management Plan was implemented to reduce the fishing mortality of heavily fished groundfish stocks and promote their rebuilding to sustainable biomass levels. Tools used included seasonal and year-round area closures, gear restrictions (mesh sizes, number of nets/hooks, etc.), minimum sizes for fish by species, trip limits, limited access to a certain number of boats, and restrictions on the annual number of days a vessel was allowed to fish for groundfish (days-at-sea (DAS)). Over the intervening years this FMP has been modified by a series of amendments and framework adjustments.

- A1.304. Concerned about the status of the stocks and the efficiency of management measures was exemplified 1991 when the Conservation Law Foundation filed suit against the U.S Department of Commerce to force an end to the over fishing of NE Groundfish. Settlement of this suit in August, 1991 led to the strengthening of fishery management measures.
- A1.305. In 1994, Amendment 5 to the NEMSFMP limited the number of permits, increased mesh size by a ½ inch and began a programme to cut effort on groundfish by 50 % over five years. 9,600 km² of GB was closed and vessel activity was further restricted through the introduction of permitted DAS. Despite these measures, groundfish stock biomasses continued to deteriorate.
- A1.306. More protective measures were included in Amendment 7, implemented in July, 1997. This established BTARGETS for rebuilding, accelerated the effort reduction of Amendment 5 and set FTARGETS for cod, haddock and yellowtail flounder.
- A1.307. In 1996, the Sustainable Fisheries Act SFA required the NMFS to implement FMPs that would end overfishing and rebuild fish stocks to healthy and sustainable levels. The SFA required FMCs to manage for long-term sustainability.
- A1.308. On 1 May 2010, a new management program, Amendment 16 to the NEMSFMP was implemented to comply with the requirements of the MSRA. This amendment introduced two main changes. Firstly, “hard quota” annual limits on the total allowable catch (TAC) for all of the 20 stocks in the groundfish complex were introduced. Secondly, the use of fishing sectors was extended strengthening the concept of improved management through the introduction of quasi- property rights. Groups of fishing vessels (sectors) are each allotted a share (quota) of the total annual groundfish TACs were based on the historical fishing of individual member boats. Sectors received quota for 9 of 14 groundfish species in the FMP and became exempt from many of the effort controls such as multispecies DAS limitations. Fishers who chose not to belong to a sector operate under a common pool that maintains the traditional management tools of DAS and trip limits.
- A1.309. Amendment 16 authorized 19 sectors. Two sectors, the GB Cod Hook Sector and the GB Cod Fixed Gear Sector, had functioned previously. All vessels with a Federal limited access groundfish permit are eligible to join a groundfish sector. While just 55 % of eligible Northeast multispecies permit holders signed up for sectors, these represented 98 % of the groundfish allocations.

- A1.310. NEFMC defines a "sector" "as a group of persons holding limited access vessel permits under the FMP through which the sector is being formed, who have voluntarily entered into a contract and agree to certain fishing restrictions for a specified period of time, and which has been granted a TAC in order to achieve objectives consistent with the applicable FMP goals and objectives".
- A1.311. Seventeen sectors operated in the 2010 fishing year. NEFMC is currently developing Framework 45 to the NEMSFMP, including considering the authorisation of 3 additional sectors. There is also consideration of the options (draft Amendment 17) for State Permit Banks that would have the objective of providing options to protect the interests of small scale fishers and counter the stacking of permits and concentration of ownership.

Communities

- A1.312. National Standard 8 (section 301(8)) requires that conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

DESIGN

- A1.313. Bonzon et al identify 13 design principles highlight clear lessons learned from around the world and basic rules of thumb for a successful catch share program.
1. Design the catch share program based on clearly-articulated goals with measures of success.
 2. Consider including in the catch share programme species that are commonly caught together.
 3. Create separate catch limits and shares for each species, stock and zone in the catch share programme. The catch limit should account for all sources of fishing mortality and should prevent overfishing. If the stock is already overfished, the catch limit should be set at a level that will rebuild the stock.
 4. Develop mechanisms for accommodating new entrants during the design of the catch share programme and prior to initial share allocation.

An Appraisal of the Options for the Allocation of Fishing Opportunities in Scotland

5. Allocate shares for sufficient length to encourage stewardship and appropriate investment by shareholders and associated industries. This can be achieved by allocating in perpetuity and/or for significant periods of time with a strong assumption of renewal, provided rules are adhered to.
 6. Employ percentage shares, when possible, of the overall cap rather than absolute weight units for long-term shares.
 7. To increase program flexibility consider trading, permanent and/or temporary, which is generally a hallmark of catch share programmes.
 8. Develop a transparent, independent allocation process that is functionally separate from the rest of the design process. Allocations that retain the relative equity positions of stakeholders are the least contentious.
 9. Employ an allocation appeals process that allows eligible participants to refute allocated amounts with verifiable data.
 10. Encourage cost-effective, transparent trading that is easy for all participants.
 11. Employ transparent catch accounting completed regularly enough to ensure the catch limit is not exceeded.
 12. Design and implement a fishery information system that keeps costs low and is effective for conducting catch accounting, collecting scientific data and enforcing the law.
 13. Assess performance against goals and encourage innovation to improve the program over time.
- A1.314. The authors then go on to the recommended steps in designing a programme.
- Step 1 Define Program Goals: Identify the program's biological and ecological goals; Identify the program's economic goals; Identify the program's social goals; Balance trade-offs.
 - Step 2 Define and Quantify the Available Resource: Determine which species will be included; Determine which stocks will be included; Delineate the spatial range and identify zones; Determine the allowable catch limit for each species, stock and zone.
 - Step 3 Define Eligible Participants: Decide if the privilege will be allocated to individuals or groups; Determine who may hold and fish shares; Establish limits on the concentration of shares; Determine how new participants will enter the fishery.

- Step 4 Define the Privilege. Decide whether the privilege will be species-based or species and area-based; Determine the tenure length of the privilege; Define the long-term share; Determine the annual allocation unit; Decide if the catch share will be permanently and/or temporarily transferable; Determine any restrictions on trading and use of shares
- Step 5 Assign the Privilege: Establish a decision-making body for initial allocation; Determine when allocation will occur; Establish an appeals process; Determine who is eligible to receive shares; Decide whether initial shares will be auctioned or granted; Determine how many shares eligible recipients will receive; Identify and gather available data for allocation decisions.
- Step 6 Develop Administrative Systems: Establish how trading will occur; Determine how catch accounting will work; Determine what fishery information is required for science, catch accounting and enforcement; Determine who covers the program cost
- Step 7 Assess Performance and Innovate: Conduct regular program reviews; Assess performance against goals.

CONCLUSIONS

Introduction

A1.315. **The main studies used to develop this working paper include a conclusions. These are** summarised below.

MRAG et al

Findings

Objectives for RBM

A1.316. RBM systems within the EU are not specifically aimed at meeting the objectives of the CFP, but are generally tailored to local circumstances and objectives. RBM systems have evolved independently and diversely in most parts of Europe and may be significantly driven by local business and / or political needs.

Benefits

A1.317. RBM systems have contributed to sustainable biological productivity and improved economic performance of some fisheries where rights are exclusive, easily enforceable (secure), long term and tradable.

A1.318. The benefits of RBM systems have proved difficult to demonstrate for the international marine fisheries governed by the CFP. Here, the principal instruments for control are TACs and technical measures set at the European level. TACs are divided among countries by fixed political agreement, using the principle of 'relative stability'.

A1.319. Rights' allocation occurs within countries for the purpose of partitioning the available national quota among the fishing interests within that country. These national RBM systems can help to rationalise national fishing effort even though some systems are cumbersome, complicated, and expensive to administer. However, their contribution to the economic efficiency of fishing, to the slowing of the race to fish, or to motivating better husbandry of international stocks can be undermined by the non-exclusivity of access (essentially a problem of design), and/or poor implementation.

Approach

A1.320. A pattern is apparent among quota managed fisheries. In cases where catches do not exceed the overall quota a common quota pool may be sufficient, however, as competition for quota is increased, so quota allocations and ITQs become the management tools of choice.

A1.321. However, while there are benefits in moving towards management systems that provide higher quality rights for participants, the approach is not an automatic panacea for ailing fisheries. RBM systems with high Q-values, such as ITQs and TURFs will not necessarily provide the best outcome for all fisheries. It is better to think in terms of developing RBM systems through a process of evolution, supported by additional measures both to encourage desirable outcomes, such as reduction in over-capacity, and to mitigate undesirable outcomes such as concentration and/or marginalisation of small scale operators.

Stakeholder Responsibility

A1.322. A vital factor in reaping the benefits of RBM is an industry that demonstrates a responsibility for stewardship of the resource. This was an important element in the success of ITQs shown in the Danish pelagic fishery. In this example, capacity reduction has been achieved without the need to allocate public money, good stewardship has been promoted from within the local producer organisation and fisheries remain profitable. By contrast, in the Netherlands case, ITQs performed very poorly in the 1970s and '80s because of an initial failure to effectively limit fishing capacity and monitor catches. More recently, the system has improved significantly through the establishment of co-management-type framework that has increased both responsibility and compliance, but the beam trawl fleet is still operating at an economic loss, largely due to high operating costs.

A1.323. Involving the resource users in establishing and enforcing management measures can have significant benefits across a range of fishery types and regions.

TURFS

A1.324. With respect to TURFs, there are a variety of institutional structures that can be used for their implementation, including associations, consortia, groups of users and POs, which can be involved in co-management approaches as platforms to launch technical measures to enhance resource sustainability. Where the establishment of TURFs involves the exclusion of previous users of the resource it must be carried out in an equitable manner, and compensation should be provided where appropriate.

Attributes

A1.325. Three of the four attributes used to characterise RBM systems, namely exclusivity, security and validity have been shown to be essential. If any one of these is reduced to zero, the right becomes essentially worthless.

Transferability

A1.326. While transferability can have multiple benefits, it is not essential and Member States have shown different approaches to its implementation. Some element of constraint on transferability is common, to protect national interests and implement national policies, but markets in rights develop naturally where the rights have a clear value.

A1.327. Aside from allowing the exit of less profitable operators from the fishery, transferability can be beneficial in mixed fisheries such as in the North Sea, because vessels can obtain the optimal mix of quota to maximise profitability and minimise discards. This mechanism appears to have been particularly active in the Danish VTQ system for demersal fisheries, now replaced by an ITQ system.

A1.328. In IQ systems, where there is a specific concern to restrict transferability (e.g. the Belgian flatfish fishery), similar outcomes to those of ITQ systems (reduction in capacity, reduction in the race to fish, and obtaining an appropriate mix of quota) can be achieved by other nationally-implemented measures, such as vessel decommissioning schemes and national quota swaps. This requires more input (time and resources) from the central authorities, rather than allowing the market to act.

Fishing Communities

A1.329. A number of Member States have purposely restricted transferability of rights with the aim of protecting national fishing interests, small-scale fishers and fishing-dependent communities. Even in systems where transferability is significant (e.g. VTQ and ITQ systems) there are often systems in place to ensure the protection of small-scale fishers and to ensure the possibility of new entrants to the fishery, such as allocating a

proportion of national quota to the small-scale sector, and reserving a part of the quota for new entrants in order to build up a track record.

Ownership of Rights

A1.330. In the case of quota-managed fisheries, of concern at the Community level is the possible impact of quota trading on the capability to monitor and retain control over quota ownership and uptake. Current case law indicates that Member States can limit quota entitlement to entities with an economic link to the Member State, although such rules must be non-discriminatory. Such arrangements could be extended to a more regional model. In this regard it is also worth considering the distinction between quota ownership and use rights. Essentially the Member State could retain the ownership of the quota that is allocated to it by the EC, maintaining relative stability, while the right to use a portion of that quota allocation is what is sold, leased, or otherwise transferred between participants in the fishery. A more restrictive approach would be to allow only in-year quota allocations (not the use rights themselves) to be traded between participants. No matter to whom the quota is transferred, the Member State owner needs to be in a position to continue to meet its obligations under the CFP in terms of compliance with its quota limits.

Management Costs

A1.331. The requirement for extensive management and monitoring of quota uptake in quota based RBM systems can be a problem for some Member States and some lower value or small-scale fisheries. Administration costs include the costs of trading rights among owners, the costs of other organisations such as POs and national authorities which are also involved, plus the costs of record keeping and enforcement without which there is no security or exclusivity of rights. These costs are on top of the costs of managing the fisheries generally through monitoring and the setting of TACs or other controls. Reliable information on all of these costs is very hard to obtain across all countries but is relevant to the assessment of economic efficiency.

RBM Evaluation

A1.332. Cost-benefit analysis of any proposed changes to RBM systems is highly desirable. Involvement of executives from the fishing industry and POs would probably assist the collection of cost information.

Cost Recovery

A1.333. Also of importance, is the careful consideration of cost recovery at an early stage in the design of any new RBM system.

Implementation Period

A1.334. It appears that moving towards IQ and ITQ management systems is best viewed as an iterative process that can require a substantial period of time, and the resulting management system may be made up of a range of input and output measures, both RBM and non-RBM.

Capacity Reduction / Decommissioning

A1.335. The use of combined mechanisms of decommissioning schemes and RBM can support effective capacity reduction, deterring the race to fish and allowing for the modernisation of the fleets. While effective provisions for scrapping vessels may support the removal of the poorest performers in the fleet, the efficient allocation of high-quality fishing rights supports the improved economic performance for those who remain in the fishery. For example, the management of the Spanish 300 fleet has recently moved to ITQs, but the active decommissioning process that took place well before ITQs replaced the individual effort quotas was a significant management success.

A1.336. It is important to ensure that decommissioning follows OECD guidelines and that the capacity cannot re-enter the fishery, or another fishery, after being withdrawn.

A1.337. However, decommissioning schemes are expensive and capacity reductions have been achieved also through market measures (i.e. transferability of rights) at minimal public cost, such as in Denmark, freeing up resources to be invested in research and innovation for the sector.

Licensing Systems

A1.338. As shown by the example of the French Mediterranean Gulf of Lions trawl fishery, more straightforward, and potentially cheaper to administer, licensing systems can be an effective means of managing fisheries, when complemented with other management measures to reduce efficacy (in terms of fishable area in this case) and increase selectivity of both the vessels and their gear. The race to fish remains a problem, however, resulting in technical creep that needs to be carefully monitored.

Scientific Basis for Decision Making

A1.339. RBM systems do not avoid the need for sound scientific data about fish and fisheries. ITQs, for example, need an annual stock assessment and the setting of a TAC. Unfortunately, both of these scientific aspects have been criticised extensively under the current CFP management system. However, if RBM successfully reduces fishing pressures on a stock, the need for TACs to be highly accurate to avoid stock collapse can be reduced somewhat.

Effort Based Rights

A1.340. Effort-based rights, such as ITE, might prove easier to manage in some fisheries but, similarly, the technical aspects of evaluating the effort attributable to different types of gear **are substantial**.

Conclusions

Local conditions.

A1.341. RBM systems need to be tailored to local circumstances and objectives.

Scientific requirements

A1.342. A sound scientific basis for establishing exploitation limits is important for any management system. For quantitative RBM systems this requirement may be even greater. For example, management through ITQs requires accurate real-time specification of TACs, adjusted annually in response to stock fluctuations.

Cost-benefit assessment

A1.343. Sophisticated RBM systems can be costly to implement and maintain. Such systems may be economically warranted only for large, valuable resource stocks.

Economic performance

A1.344. Previous research has shown resource rent generation is highest in those systems that have the highest quality rights. Systems with weak rights showed negative or low resource rents and could not cover the management cost. These findings showed a clear link between the management regime and the opportunity for profitable fisheries.

Avoidance of overcapacity

A1.345. The OECD recommends that fisheries management systems are designed to prevent overcapacity and overfishing from occurring, and that there should be appropriate incentives for fishers to automatically adjust fishing capacity and effort, so as to avoid the use of expensive decommissioning schemes where possible. RBM systems that do not lead to a natural reduction in excess fishing capacity should be augmented by active decommissioning schemes to promote an improved balance between fishing capacity and fishing opportunities. Schemes should not allow capacity once removed to return to the fishery and preferably should not require the use of public funds.

Precautionary management

A1.346. Fishery resources typically suffer from high unpredictability, which can lead to overfishing or collapse unless specifically allowed for. The fishing industry is also impacted by numerous factors which are outside of the control of any management agency or authority, for example, oil price or world currency markets. Even well-managed fisheries may suffer shocks from external factors, which can affect their economic performance.

Enforcement

A1.347. Rights require enforcement, because of the potential impacts of illegal activities. Without effective enforcement, exclusivity and security have little meaning.

Transferability

A1.348. Enhanced transferability of rights and improved flexibility in rights management may produce a reduction of redundant capacity and enhancement of efficiency. Nevertheless, even when a right is not officially transferable, if the right is valuable, stakeholders will find some element of the system through which this value can be expressed. In IQ systems, where there is a specific concern to restrict transferability, similar outcomes to those of ITQ systems (reduction in capacity, reduction in the race to fish, and obtaining an appropriate mix of quota) can be achieved by other nationally-implemented measures, such as decommissioning schemes and national quota swaps. This requires more input (time and resources) from the central authorities, rather than allowing the market to act. A number of Member States have purposely restricted transferability of rights with the aim of protecting national fishing interests, small scale fishers and fishing-dependent communities. Even in systems where transferability is significant (e.g. VTQ and ITQ systems) there are often systems in place to ensure the protection of small-scale fishers and to ensure the possibility of new entrants to the fishery, such as allocating a proportion of national quota to the small-scale sector, and reserving a part of the quota for new entrants in order to build up a track record.

Co-management and fisher responsibility

A1.349. Effective implementation will not be realised without the cooperation of fishers in terms of design, implementation, and compliance. The industry needs to be empowered to take on responsibility for stewardship of the resource to ensure a sustainable future for fisheries. The use of POs not only as platforms for quota management but also as platforms to develop technical measures may enhance resource sustainability. PO management of markets for rights, when based on sufficient/necessary provision of information to Member states (e.g. quota uptake), can

increase the ability of fishers to adapt fishing strategies resulting in economic and social benefits.

Government intervention

A1.350. Even in market-based ITQ systems, national authorities should establish the param. and limits within which the system should work, and may wish to maintain the possibility for intervention should it be seen to not be functioning as expected. While longer-term rights are generally regarded to be higher quality, it may be prudent to include a sunset clause to enable such intervention if necessary. An RBM system may be seen as a 'resource give-away', unless accompanied by a system of fair user fees. Mechanisms for cost recovery should be given due consideration at an early stage, as it is much harder to implement later in the process.

Markets for rights

A1.351. The existence and functioning of markets in the EU, is bringing about considerable benefits in terms of resulting efficiencies and fleet reductions, in line with CFP objectives. However, Member States should be free to continue to impose limitations on the functioning of markets to protect vulnerable/ dependent fishing communities. Stakeholders must be fully involved in decisions taken by Member States as to the establishment and development of markets for rights. With increasing value of fishing rights resulting from the development and functioning of markets, special provisions may be required to assist new entrants to the fishery because of increasingly high entry costs. It need not be necessary for State administrations to retain complete control over the monitoring of transfer markets.

CFP objectives

A1.352. The principal driver for many of the more sophisticated quota based RBM systems in the EU has been Commission regulations establishing TACs and quotas for a number of species, and requirements to limit fishing capacity. RBM systems are usually not sufficient in themselves to meet the objectives of the CFP. This requires a range of fisheries management measures at different levels that may constitute a 'bundle' of rights. Likewise, implementation of ITQs does not necessarily lead to improved economic performance of the fleet and/or better matching of fleet capacity with fishing opportunities. Coherent policies in other sectors (e.g. economic development) are needed to avoid the undermining of RBM approaches.

National objectives

A1.353. These may impose constraints on the development of RBM, but do not necessarily undermine the meeting of CFP objectives. RBM systems need to be tailored to local circumstances and objectives. In this regard, moving towards IQ and ITQ management systems is necessarily an iterative process that takes a substantial period of time, and should allow opportunities for stakeholder input and revision or modification of the system as it evolves.

Small scale fisheries

A1.354. Schemes for small-scale fisheries, such as a separate quota allocation, and/or prevention of consolidation can be implemented alongside ITQ systems and result in their protection and continued participation in the fishery.

Eliason et al

Management Approaches

A1.355. Fisheries management in the seven Nordic countries operate in societies that, historically and socially, are characterised by a close sense of affinity and shared values. However, these systems operate under conditions that differ significantly from nation to nation, especially in terms of the countries' economic dependence on fishery resources, their socio-cultural approaches to fisheries, and their marine eco-systems. As a result of these factors, the Nordic countries have relatively diverse systems of fisheries management. Licenses and individual quotas were introduced in Norway and Iceland respectively during the 1970s. Since then the fisheries management systems applied in the Nordic countries have been under constant development to meet the dynamics of policy objectives related to resource protection and utilization, industry economic performance and social concerns.

Fleet Capacity

A1.356. RBM systems with transferability of rights, and particularly ITQ/VTQ systems applying output control, have contributed to adjusting the fleet capacity to the fish resources available for exploitation. This is the common experience from Iceland, Norway and Denmark, despite the differences in sector structure and resource base. The effect on fleet overcapacity of RBM systems applying input control has not been demonstrated because the fisheries situation in the Faroe Islands has not called for an overall capacity reduction, but only for a structural adaptation of the fleet.

Economic Performance

A1.357. With the reduction of the fleet capacity to match the TACs and fish quotas, the economic performance of the remaining active Nordic fishing vessels has improved significantly in all fleet segments. However, the debts in the sector have also increased. With the adoption of RBM systems, the fishing industry in the Nordic countries has turned into a profitable economic sector, generating a sizeable resource rent.

Stakeholder Involvement

A1.358. The Nordic experience shows that the introduction of RBM systems is highly sensitive, despite “obvious advantages” in terms of economic efficiency etc. This relates not only to the perception of the impacts of such management systems on fishing communities and sector employment, but also to the principles applied for the allocation of fishing rights and the distribution of the associated wealth. The lesson learned from the Nordic experience is that the introduction of RBM should be adaptive and with an open discussion among all the stakeholders about the features of the system in relation to policy objectives in fisheries and in society at large.

Fishing Communities

A1.359. RBM systems can be designed to cater for social concerns in relation to small-scale fisheries and coastal communities.

A1.360. The policy context for fisheries management in all the Nordic countries has for long been taking these two issues into account, and the RBM systems adopted have been designed accordingly. The experience in the Nordic countries shows that, even if ITQ / VTQ systems are particularly suited to cater for capacity adaptation and economic efficiency, they can be designed to cater for social concerns related to small-scale fisheries and coastal communities. This can either be through a special “coastal fisheries” scheme involving special rights (and obligations) as implemented in Denmark, or through restrictions on the quota allocation and transfer of quotas between vessel segments and/or geographical areas as practiced in Norway and Iceland.

New Entrants

A1.361. Closely associated with the concern for the livelihood of coastal communities is the concern for new (particularly young) entrants to the fishery. This is in particular about meeting the increasing costs of investments, associated with most RBM systems, in both material assets (vessel and fishing gear) and immaterial assets (fish quotas). This concern has also been addressed in the design of the systems adopted in the Nordic countries.

Cross Cutting Issues

- A1.362. There are important relationships between RBM, co-management and discards. There is a strong relationship between rights-based management models and co-management. Rights-based management, at least in the form of ITQs, and co-management are sometimes presented as contrasting and incompatible models. This is, however, not always the case. On the contrary, the establishment of stronger rights, tied to social groups with clearly defined membership, usually improves the capacity for collective action within such groups. In addition to their consequences for the individual rights holder, the introduction of RBM models often leads to improved capacity for stakeholder group involvement. In other words: RBM models may improve the possibilities for strong co-management and active user group participation in management. This effect should be taken into consideration in the design and implementation of RBM systems.
- A1.363. It has also been shown that RBM systems and co-management are relevant to the issue of discards and RBM models may constitute an important, partial solution to the discard problem. As the Icelandic case shows, quota trading, carefully designed with regard to the specifics of the fishery at hand, is a flexible mechanism for adapting a vessel's quota portfolio to actual catches. In this way, quotas are distributed over the fleet in a way that reduces the discard problem.
- A1.364. Co-management models may provide an effective approach to the discard problem. In the Danish example, there are ways to make stakeholder groups responsible with regard to discards.

Responsibilities

- A1.365. In general terms the Nordic experience shows the potential for introducing increased delegation, in the form of rights-based and co-management solutions, to solve entrenched problems. If the appropriate framework is provided, stakeholder groups show great capacity for taking on the responsibility for solving complex management problems.

Meridian and MRAG Americas

- A1.366. The authors identified the following key issues and questions for New England that may be considered relevant to the options in Scotland.

Initial Program Design

- A1.367. There are two key aspects of initial program design that appear to be of major concern to stakeholders: clear identification of the goals of catch

shares programmes (including socio-economic goals) and establishment of a clear and deliberative strategy for transitioning from effort controls to catch shares.

Goals and Objectives

A1.368. Setting clear and measurable goals and objectives to guide management is critical to the success of any fisheries management system, including catch shares. Goals and objectives for specific regions and fisheries can vary greatly from place to place. In order for management strategies to achieve and be able to clearly document success, it is important to establish specific goals and objectives at appropriate regional and fishery scales. These should include goals that are biological, ecological, social, and economic, and identified with robust and meaningful stakeholder input. Key areas are:

- What are the goals and objectives for fisheries management (including ecological and socioeconomic) both broadly and for particular fisheries?
- By what process will goals and objectives be defined? How will stakeholders be engaged in that process?
- What criteria will be used to determine if catch shares are appropriate for particular fisheries, i.e., if catch shares systems can help meet the goals? What kind of catch shares systems would be most successful for those fisheries that are appropriate?
- What metrics will be used to track progress toward goals and objectives once they are established?
- How will “success” of a catch shares program be defined?

Transition Strategy

A1.369. Management changes are often difficult and costly for stakeholders as they struggle to understand and work within a shifting regulatory context. A well-designed and executed transition strategy can ease the burden of change on fishery participants and managers alike. A transition strategy can facilitate step-wise evaluation of social and economic impacts and adjustment of management strategies to better achieve goals in the early years of implementation.

Adaptive Management Set-Asides

A1.370. In order to provide flexibility for decision makers to take future action to address unanticipated impacts of a new quota shares system, adaptive management set-asides can be factored into the allocation process. There should also be consideration of the buffers or set-asides of quota

should be implemented to account for management uncertainty and allow for adaptive management?

Harvesting Strategies and Policies

A1.371. To ensure fisheries are healthy and sustainable into the future, and therefore provide maximum benefit to fishers and the communities they support, habitat and other ecosystem considerations must be taken into account.

Allocation and Transferability

A1.372. Initial allocation of quota and the transferability of quota after it has been allocated are two of the most challenging issues for decision makers and stakeholders to address. They are also two of the most important because these decisions will in large part determine what a fishery and fishing economies will look like into the future.

Transferability of Quota

A1.373. The ability to transfer quota among participants in a catch shares system is important for economic efficiency. Transfers can include permanent changes of ownership and temporary in-season transfers such as trades and leases. Quota transfer is essential for allowing quota holders to reconcile the quantities of quota they have the right to harvest with what they actually catch. With regard to leasing, benefits can include the possibility of a stream of income during retirement and opportunities for new entrants to build up capital to buy quota. There are potential downsides to transfers as well that are important to carefully consider in the design of catch shares systems. These include excessive consolidation that results in the decline of traditional fishing communities and fishing practices, and inflated quota purchasing and leasing prices, among other impacts. Key questions for decision makers include: What rules and mechanisms will be put in place for transferability and ownership of quota? Should trading rules be established for eligibility, transparency, restrictions based on capacity or geography, ownership caps, conservation taxes on transfers, starting dates for allowing transfers, and sunset provisions? What platforms will be created for leasing? What rules and limitations will be placed on leasing, if any? Should leases be made transparent to the public?

Monitoring, Reporting, and Enforcement

A1.374. Reliable catch monitoring and reporting are critical for the success of any fishery management system. They are particularly important for catch shares systems because each fisher or group of fishers is responsible and accountable for staying within their quota.

Communication and Decision Making Processes

A1.375. Any history of distrust and lack of confidence between fishers and managers make effective communication among the parties and collaborative decision making particularly challenging. Improving relationships and collaboration among stakeholders may require on-going, meaningful, authentic, and neutral forums for discussion and decision making.

Information to Support Decision Making

A1.376. Ideally, decisions about the design and implementation of catch shares would be based on a range of up-to-date information about the current state of the fishery and fishing economy, as well as projections about the possible outcomes of various catch shares design options. Insufficient analysis of baseline conditions, projections for impacts under proposed management systems, and tracking of progress through time, including of social and economic impacts, can hamper the success of management strategies and further degrade relationships with key stakeholders.

Social and Economic Considerations

A1.377. Social and economic characteristics that are important to the region's fishing stakeholders and depend on healthy ecosystems for long term success are necessarily constrained by the limitations of the natural environment. Within those limitations, however, are abundant opportunities to define the socioeconomic characteristics that a community, an industry, or a region envisions for the future. Maximizing those opportunities will require explicit identification of region or fishery-specific visions and goals, and implementation of policies to make that vision a reality. There are a diversity of viewpoints about the ideal characteristics of fishing jobs, fleet composition and diversity, community protection, and other social and economic qualities, and these will be challenging to reconcile. However, unless efforts are made to address these differences and reach some agreement about a vision for fishing fleets and policies to achieve that vision, market forces and regulatory authorities alone will determine the region's future. Key questions of interest may include: What is the appropriate and desired mix of vessel and ownership types for particular fisheries and how can policies under catch shares be designed to achieve that vision? How should excessive consolidation be defined, and what measures would be appropriate and effective to prevent it? How should the quality of jobs under a catch shares systems be measured (e.g., compensation or consistency)?

Should crew be given a stake in the fishery as a point of entry to ownership (e.g. through crew allocation)? What mechanisms should be used to prevent the unintended transfer of effort from specific fisheries / local areas? How can new entrant-related and small operator-specific issues be addressed?

Community Impacts

A1.378. A key consideration for stakeholders and managers designing a catch shares system is how they want the region's fishing communities to look in the future. Decision makers should be aware of the costs and benefits of mechanisms for protecting fishing communities. If community preservation efforts are to take place, some key questions that will need to be answered include: How should "community" be defined for the purposes of community preservation efforts? And how does the definition chosen affect relationships among and within cooperative arrangements, such as sectors? What criteria should be used to determine which communities require special effort to preserve them under RBA system, and what measures are most effective at doing so? Should quota be initially allocated to communities? What options are available for communities after an initial allocation that did not include them has been made? Are processor quotas appropriate for protecting communities? What policies to protect port infrastructure should be in place? For many fisheries, an explicit geographic focus and policies to preserve traditional fishing communities and fishing practices can contribute to the success of catch shares programmes. When fishers know the other fishers in the programme as neighbours and friends, they are more likely to abide by rules that will benefit everyone. Additionally, keeping a certain amount of the TAC within a community helps protect jobs and fishing-related infrastructure. The challenge for decision makers is to define community and distribute benefits to those entities in a manner that reduces, rather than increases, conflict.

OECD

Introduction

A1.379. The way in which different market-like instruments bundle characteristics together helps to determine the outcomes for the fisheries sector. In reviewing the experience of OECD countries, the study found that some instruments (such as IQs for effort and catches) are directed towards maximizing the economic efficiency of resource use, while others (such as CCQs and some types of vessel catch limits) will allow fishers to more readily adapt to short-term economic and natural fluctuations. Yet others (such as ITQs) are especially beneficial in facilitating long-term adjustment with respect to investment and capacity.

- A1.380. Natural, geographical and economic conditions play a role in the effectiveness of different market-like instruments. The study provided evidence that some instruments may be more appropriate for small-scale fisheries dedicated to local consumption and characterised by a large number of operators (for example, CQs and ITEQs). Other instruments (such ITQs) may be more appropriate for large scale and industrial fisheries, while others may be better suited to managing fisheries for sedentary species (for example, TURFS).
- A1.381. In order to successfully develop and implement market-like instruments, fisheries managers need to address an array of technical, administrative and social challenges. Drawing on the experience of OECD member countries, the study presents ten tracks that policy makers can draw upon in meeting these challenges and which can ease the introduction and improve the design of market-like instruments.

Operational Issues

Track 1: Making all stakeholders comfortable with the concept of market-like instruments

There are two major obstacles to reform efforts focusing on increasing the use of market-like instruments in OECD fisheries sectors. These relate to false perceptions about the nature of market-like instruments and concerns about “privatising” publicly owned fisheries resources¹. In relation to the first of these issues, information from various industry, NGO and official sources suggests that the concept of “market-like instruments” is often poorly understood, and is frequently restricted to comprise theoretical ITQ systems. Policy makers need to explain and clarify the broad range of market mechanisms that are actually in use to improve the acceptability of such instruments by the broader community.

Track 2: Preferring an incremental/gradual implementation

Government decisions regarding the pace of change of management reforms, the duration of transition periods, the general strategy of reform (e.g. gradual vs. “one-off” reform), and so on often appear to be sensitive issues to many stakeholders in the sector. Gaining stakeholder acceptance of management reforms will require obtaining consensus about the rate at which change can proceed, often based on perceptions about how quickly fishers and their communities will be able to adapt and adjust their operations and livelihoods to a changing set of circumstances. Experience indicates that OECD policy makers have generally preferred an incremental implementation of new market-like instruments. Such a strategy may reduce the immediate benefits of reform, but has generally been necessary to enable the industry to make an orderly transition to the new management regime. It has also provided an opportunity for managers to further develop and refine the instruments

(although there is clearly a limit to the length of time that this can occur due to potential issues of policy credibility if constant change is undertaken).

Track 3: Not necessarily adopting a “one-size-fits-all” strategy

The variety of market-like instruments, coupled with the variations in their implementation between and within OECD countries, suggests that a “one-size-fits-all” approach is not necessarily appropriate or optimal. Indeed, even within the “stronger” market-like instruments such as ITQs, there is considerable variation in the details of their design and implementation between countries. Such variations reflect differences in the economic, social, historical and cultural aspects of fisheries in particular countries and highlight the need for managers to be flexible and adaptable in the design of market-like instruments. There are, without doubt, benefits to having a relatively consistent and homogeneous approach to management instruments. There are likely to be economies of scale and benefits from “learning by doing” associated with a more homogenous system. This will help to make monitoring and management easier and more efficient. It will also facilitate the understanding of stakeholders and regulators, which may be particularly important when two or more market-like instruments may overlap but follow different rules. Finally, general fisheries management within a country is likely to benefit from a more homogeneous and comprehensive regime of market-like instruments. In particular, this could reduce problems related to the “transfer of capacity” between fisheries managed under different market-like instruments.

Track 4: Carefully designing the allocation process

The issue of who should hold use rights, and in what quantity, is a very politically sensitive issue due to two key questions: How should the initial allocation of rights be carried out? How should the allocation of rights evolve in the future? To ease the implementation of any market-like instrument, the allocation rules need to be as clear as possible and should be agreed upon early in the process of designing the policy regime. This will help avoid adverse effects on resource management (e.g. strategic behaviour prior to the implementation of a market-like instrument to increase historical catches, including so-called “fish for quota” behaviour); and get stakeholders’ support, by clarifying how they are going to be affected by the reform and minimising potential distributional conflicts.

Track 5: Pragmatically using market forces

Market based mechanisms are increasingly used in the management of natural resources. Both ex-ante and ex post analysis of tradable permits and other market-based schemes show that several criteria have to be taken into account when considering the introduction (and the assessment) of a new

market-like instrument. These include, the level of transferability, the structure and size of the market and associated issues such as the operating/running costs of the market (including transaction costs), and the “banking” possibility (i.e. the possibility to bank carryover or quotas overrun). Transferability is important in the design of market mechanisms: long term transferability can facilitate structural adjustment, by allowing market forces to select the most profitable fishing operators; short term transferability allows for the flexibility of the system (i.e. ensure the most appropriate use of the rights). For example, short term transferability is useful when a fisher happens to become sick or whose vessel breaks down for a short period but can still obtain some income or compensation by renting out the use rights for a short period; and transferability allows for the revelation of the true/right value of the fishing right in the market place. Both long and short term transferable market-like instruments are currently in place in at least 19 OECD countries, although in most cases, transferability is restricted for social and cultural reasons and in some cases remains relatively informal.

Track 6: Overcoming the “excessive consolidation” question

The potential for the concentration of fishing rights as a result of the introduction of market-like instruments is often a concern and a source of resistance to the reform of fisheries management systems. The key issues relate to concerns that: concentration of market power may lead to anti-competitive behaviour and resulting net societal losses; concentration of rights in the hands of the biggest operators will have adverse impacts on smaller operators; employment and income will be reduced in small-scale fishing communities; and that “tenant fishing” systems may emerge, where fishers pay rights holders for access.

Track 7: Using the “demonstration effect”

The fear of change is often an obstacle to policy reform. The use of market mechanisms may present a challenge to stakeholders in the sector (including fisheries who may have had no direct experience with the use of such policy instruments. Unlike other sectors, some degree of uncertainty about the outcomes of policy reform often prevails in the fisheries sector as a result of a lack of ex-ante and ex post information available to fisheries managers. Uncertainty can be reduced by the conduct of ex-ante impact assessments, in order to identify the potential welfare gain and the potential beneficiaries and losers of the reform. However, proper impact assessments have a cost that may be considered too high. An alternative and cheaper way forward to reduce fear and overcome this obstacle can consist in providing evidence of successful implementation of market-like instruments in other jurisdictions.

Track 8: Involving stakeholders in the reform process

The fishing industry may be opposed to changes in the economic and social organisation of fisheries for a variety of economic, social and cultural reasons, although the degree of opposition will vary from one fishery to another. The close involvement of the fishing industry and other stakeholders throughout the process is needed to ensure buy-in to policy changes. The involvement of stakeholder groups in the process can improve the chances that a shared “ownership” of both the process and the outcome can be achieved. This may have two clear benefits: drawing stakeholders into the initial allocation process can contribute to minimising conflicts related to distributional and equity issues; and involving stakeholders in the management process can help to reduce long term compliance costs.

Track 9: Integrating fisheries characteristics

The choice of market-like instrument will also depend on the particular fisheries characteristics, including (a) the extent of natural fluctuation, (b) the degree of biological and technical interactions (single-species vs. multi-species fisheries), (c) the nature of the resource exploited (migratory vs. sedentary), as well as (d) the trade characteristics of the fishery (export led vs. local consumption).

Track 10: Dealing pragmatically with trade-offs

Fisheries are multi-objective activities, serving a variety of social, cultural, political, economic and ecological goals. This nature of fisheries is reinforced in much, if not all, OECD Member country legislation structuring fisheries policy. Policy makers can ease the introduction of new market-like instruments by drawing on the trade-offs. Because the trade off decisions is affected by fisheries settings, resource sustainability and budget constraints, different choices may be made for different fisheries, even in a single given country. In particular, small-scale fisheries are likely to be treated different than large-scale, industrial fisheries (at least on a temporary basis).

Implications for policy makers

Three key implications for policy makers emerge.

1. It is clear that fisheries managers have a greater array of market-like instruments at their disposal than might be appreciated. The experience of OECD countries points to the need to maintain a flexible approach to the design and implementation of market-like instruments to take into account social and biological conditions in particular fisheries, as well as the institutional constraints (both domestic and international) that may constrain the extent to which countries can take up market-like instruments. While there is no uniform approach to the

use of market-like instruments, there is clearly greater scope for the use of the range of market-like instruments in achieving improved management outcomes.

2. Several attributes of market-like instruments seem to be particularly important in improving the robustness of fisheries management, the regulatory environment for fishers and the efficiency of resource use. These relate to the duration of the right and the ability to transfer some or all of the right to others in the sector. Focusing on strengthening these characteristics will help to improve the adaptability and resilience of the sector in both the short and long term, and to internalise the process of adjusting to changing external conditions.
3. The extent of stakeholder involvement in decision making processes will heavily influence the prospects for realising the benefits from an increased use of market like instruments. This will improve the chance of the demonstration effect being achieved and heightens the comfort level that participants in the sector are likely to have with market-like instruments.

Annex 2 CONSULTATION RESPONSES

- A2.1. We undertook an extensive consultation programme with interested parties. That comprised face-to-face discussions with most of the key bodies in the fishing industry in Scotland and a questionnaire survey.
- A2.2. In our tender for the study we proposed a series of public meetings. However, after discussions with interested parties it was decided not to hold those and the resources were switched instead to more face-to-face discussions. The main reason for that decision was the widespread opinion that most fishermen and other people in the industry would not be willing to give their real views in public meetings and that they would prefer confidential discussions.
- A2.3. The consultations can be divided into six categories or groups:
- representative organisations
 - producer organisations
 - individual fishermen
 - fishing-related businesses
 - other bodies
 - other interested people.
- A2.4. About 50 face-to face discussions were held with people from the above groups, plus about 20 telephone interviews.
- A2.5. In addition a questionnaire was prepared, which is included as an appendix to this section.
- A2.6. 82 completed questionnaires had been returned by the time this report was written. The questionnaires were circulated to a list of contacts compiled with the help of Marine Scotland. In addition, an advertisement was put in the Fishing News inviting people to obtain and complete the questionnaire or submit their views separately.
- A2.7. Most of the people interviewed and most of the questionnaires supported the present system - the status quo – and wanted no significant changes. Various minor changes were suggested, as detailed below. The main concerns related to the roles of “slipper skippers” and other non-active participants, as also explained below.
- A2.8. The main exceptions to the above generalisations came from people involved in the inshore fisheries, which are not currently included in the quota system. Their opinions are also explained in more detail below.

Representative bodies

- A2.9. Discussions were held with representatives of the:
- Scottish Fishermen's Federation (SFF)
 - Scottish White Fish Producers' Association (SWFPA)
 - Scottish Pelagic Fishermen's Association (SPFA)

- A2.10. plus the regional associations in:
- Borders (Anglo-Scottish)
 - Fife
 - Orkney
 - Shetland
 - Western Isles

Producer Organisations (POs)

- A2.11. Most of the quotas are managed by the producer organisations (POs), of which there are 11 in Scotland:

Aberdeen

Anglo-Scottish, based in Berwick

Fife FPO, Pittenweem

Klondyke, Fraserburgh

Lunar, Peterhead and Fraserburgh

North East Scotland, Peterhead

Northern, Fraserburgh

Orkney

Scottish Fishermen's Organisation (SFO), Edinburgh

Shetland

West of Scotland, Mallaig

- A2.12. We had detailed face-to-face discussions with the chief executives of most of the above organisations.

Individual fishermen

- A2.13. We also had face-to-face discussions with individual fishermen, both active and retired, most of whom were previously known to the study team. A few others were met at a fisheries exhibition in Aberdeen.

Fishing-related businesses

- A2.14. Discussions were also held with a number of fishing-related businesses, such as Denholm, Don Fishing, LHD, P&J Johnstone and Shetland Catch.

Other bodies

- A2.15. Discussions were also held with other bodies and questionnaires were received from others. They included local authorities such as Aberdeenshire, Highland and Shetland Islands Councils.

Other interested people

A2.16. Finally, about 15 questionnaires were received from people who do not fall into the above categories.

Consultation results

A2.17. Note: the following is a brief summary. We can give summaries of the responses from the POs and other bodies if that would be helpful.

A2.18. The discussions with the POs and representative bodies were intended to be as comprehensive as possible, and face-to-face discussions were held with virtually all of them. It is believed therefore that their responses give an accurate and representative account of the views of the Scottish fishing industry.

A2.19. 82 completed questionnaires had been received at the time of writing. It is not possible to say that they are representative, however.

A2.20. The questionnaires were sent electronically to various bodies, some of whom returned them directly. Others circulated the questionnaire to their members or other interested parties, some of whom completed and returned them to us.

A2.21. In addition, an advert was placed in the Fishing News, inviting interested people to obtain electronic or hard copies of the questionnaire from our offices to complete them. It is not possible to say how many of the returned questionnaires were in response to the Fishing News advert but it was probably in the 30-35 range.

A2.22. The completed questionnaires cannot therefore be regarded as representative, unlike the face-to-face meetings. However, they have been very interesting to analyse.

A2.23. As mentioned above, the strong conclusion from the consultations is that most people in the Scottish fishing industry want the present quota system – Fixed Quota Allocations (FQA) – to continue, but possibly with minor modifications. There was a little support for changing to an Individual Transferable Quota (ITQ) system. However, no one was in favour of scrapping the FQA/ITQ system and reverting to the pre-1999 arrangements.

A2.24. A few people stressed that the current total allowable catches (TACs) are about 40% of what they were in 1999. That is the main reason for the contraction in the Scottish fishing fleet.

A2.25. Many people highlighted that there had been considerable instability in the industry since 1999 but that the quota system had provided some stability. They want that relative stability to continue. References were made to the

new problems created by the Cod Recovery Plan and the EC's discard ban proposals.

- A2.26. The main criticisms of the current FQA system were:
- high prices for leasing or buying quotas
 - roles of “slipper skippers” and other non-active people
 - exclusion of the under 10 metre (10mu) fleets
 - onboard camera schemes
 - lack of international trade in quotas.
- A2.27. However, there was not unanimity on the above points. In particular, most of the POs and many individual fishermen are strongly opposed to changes in favour of 10mu vessels, such as “top slicing”, which would adversely affect their own quotas. That should not be surprising.
- A2.28. The general opinion of the POs and individual fishermen is that they have invested in the quotas – some over a long period of time – and that any top slicing or other reallocation of those quotas to the inshore/10mu fleets would reduce the value of those investments. The industry is not very profitable at the present time and any such reallocation would worsen that situation.
- A2.29. It was stated that there is a perception that the intention is to discriminate against successful parts of the industry in favour of parts that have not done well in the past.
- A2.30. Many people commented that they believe that Marine Scotland want to encourage more landings and activity in the smaller ports. However, the general opinion from the consultations was that that was unrealistic. Many people referred to the substantial investments made in ports such as Peterhead, Fraserburgh, Lerwick and Scrabster, and said that similar investments could not be made in most of the smaller ports such as those on the West Coast.
- A2.31. Some people also commented that allocating more pelagic and white fish quotas to the 10mu fleet would not work because most of the skippers involved would not know what to do with them, given that they now mainly fish for shellfish.
- A2.32. A few people commented that Shetland has relatively large nephrops quotas but little catching capacity for that species. Consequently most of those quotas are swapped.
- A2.33. There was considerable criticism of the so called “slipper skippers” and “speculators”, who it is claimed have forced up quota prices.

An Appraisal of the Options for the Allocation of Fishing Opportunities in Scotland

- A2.34. However, one person interviewed said that this problem was grossly exaggerated because the slipper skippers only accounted for about 1% of the total quotas.
- A2.35. There were criticisms of the roles of companies such as P&J Johnstone and Denholm. However, those companies strongly defended their roles in the industry.
- A2.36. There were also criticisms of the on-board camera schemes which give additional quotas to the boats participating.
- A2.37. A few of the POs mentioned that the present system could be improved if there was more international trade in quotas. Examples were given of very small UK hake and coley quotas, whereas quotas for those species in other countries are often under fished. It was stated that such international trade is very difficult.

Mackay Consultants
 Ross House, 14 Ardross Street, Inverness, IV3 5NS
 Tel: 44 (0)1463 223200
 info@tonymackay.co.uk

Scotland Fisheries Consultation

An Appraisal of the Options for the Allocation of Fishing Opportunities

The Scottish Government has been given new powers to manage fish quotas in Scotland. The objective of the study is to assess whether or not the existing system of allocating quotas could be changed to the benefit of the fishing industry and Scotland as a whole. We are seeking the views of interested parties on these issues.

We would be grateful if you could complete this questionnaire and return it via email or by mail to one of the addresses noted above. Thank you.

1. Name					
2. Contact Details					
3. Would you like one of the team to contact you?	YES		N O		
4. Is your submission confidential?	YES		N O		
5. Which of these roles do you play in	Fishermen				

An Appraisal of the Options for the Allocation of Fishing Opportunities in Scotland

Scotland's Fisheries?	Vessel Owner			
	Fisher Representative			
	Fish Processing Sector			
	Onshore Services			
	Local Government			
	Other (please state)			
6. If applicable (i) which types of fishing gear do you use? (ii) and what is the LOA of your vessel?				
7. Which species are you most interested in?				
8. What is your age?	< 20		40<50	
	20<30		50<60	
	30<40		>60	
9. In your view what are the top three challenges facing the Scottish fishing industry today?				
10. What do you consider to be the key issues to be taken into consideration when reviewing the way of allocating available fishing quotas between Scottish fishers?				
11. Do you consider the current approach to allocating the Scottish fishing quota is appropriate? Why?				
12. What do you consider are the positive aspects of the current approach to allocation of quotas?				
13. What do you consider are the negative aspects of the current approach to allocation of quotas?				
14. In your opinion, how could the current approach to allocating quotas be improved? How could the quota system be improved to allow you to plan your business?				

An Appraisal of the Options for the Allocation of Fishing Opportunities in Scotland

15. How are you affected by the allocation of quotas?	
17. How satisfied are you with the approach to fisheries management in Scotland?	
18. Are there any other comments that you would like to make?	

Thank you for your cooperation.



© Crown copyright 2014

You may re-use this information (excluding logos and images) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit <http://www.nationalarchives.gov.uk/doc/open-government-licence/> or e-mail: psi@nationalarchives.gsi.gov.uk.

Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

ISBN: 978-1-78412-630-8 (web only)

The Scottish Government
St Andrew's House
Edinburgh
EH1 3DG

Produced for the Scottish Government by APS Group Scotland
DPPAS32639 (06/14)

Published by the Scottish Government, June 2014

w w w . s c o t l a n d . g o v . u k