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Operation in New Zealand

An Examination the ACE Market in New Zealand: Efficiency and Deemed Value Mitigation.

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EXECUTIVE SUMMARY

Part One – Efficiency of the ACE Market

1. The ACE market appears to meet the standard conditions for efficient markets.
2. Several information sources exist for the New Zealand Annual Catch Entitlements (ACE) market making information easily accessible.
3. Small fishers are reliant on Licensed Fish Receivers (LFRs) for both ACE information and access to ACE, and are concerned that excessive market power exists in the ACE market – small fishers are at a competitive disadvantage.
4. Larger fishers search for ACE information data more frequently than small fishers and rely on commercially supplied information via *FishServe* and direct fisher contacts.
5. ACE market participants utilise networks, including quota brokers and LFR–fisher relationships in ACE sourcing and trading.

Part Two – Arbitrage in the NZ ACE Market: Deemed Value Mitigation

1. Trade in ACE between overfished fishers for reducing deemed value liability exists in the New Zealand ACE market.
2. Over the seven year period 2005 to 2012 ACE arbitrage trading resulted in savings in deemed value obligations of \$1.766 million.
3. The number of fishstocks where arbitrage trading occurs is a small percentage of total fishstocks; in 2012 only seven fishstocks had deemed value savings, through arbitrage, of more than \$1000.
4. The general trend in arbitrage trading for 2005 to 2012 is downward – the notable exception being Ling 7.

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PART ONE – EFFICIENCY OF THE ACE MARKET

Objectives of Part One

Balancing actual catch with Annual Catch Entitlement (ACE) is crucial to the efficient operation of the New Zealand Quota Management System (QMS). ACE market efficiency is dependent on the existence of ACE prices that reflect all available information and that are readily accessible by all market participants.

Part 1 of this study analyses the information channels for ACE availability and how accessing information differs between large and small fishers, both overall and in the SNA1 fishery. The views of fishers, fish processors, and quota brokers on the operation of the ACE market have been captured by means of an ACE market survey and through extensive consultation with industry participants.

1 INTRODUCTION

Under the New Zealand Quota Management System (QMS) annual catch entitlements (ACE) are allocated based on privately owned quota share holdings of fishstocks. A fisher who owns quota shares receives an allocation of ACE. This may meet their entire annual ACE requirements, or they may need to acquire additional ACE, or conversely, dispose of excess ACE. It is also common for fishers to not own any quota shares and so they need to acquire their entire ACE requirement in the ACE market.

Participation in the quota share and ACE markets includes persons with a variety of motivations. Retired fishers and investors who own quota shares but do not fish simply sell their ACE. Licensed Fish Receivers (LFRs) may own quota shares and thereby receive ACE, and may seek to acquire additional ACE to facilitate trade with the fishers who supply them. Quota brokers participate in buying and selling ACE to and from LFRs and fishers, and may also own quota shares and receive their own ACE allocations.

Balancing of catch with ACE is a necessary requirement of the QMS. Fishers who find themselves overfished for a species are potentially liable for penalty payments through the deemed value system on the amount overfished. Fishers in an overfished position will thus seek to buy sufficient ACE to balance against their total annual catch. The process of balancing catch against ACE is on-going throughout the fishing year but becomes critical at year-end when, if the fisher remains unable to source sufficient ACE, final deemed value liabilities become binding.

Sourcing ACE in a timely, cost effective manner relies on the availability of clear information channels in the ACE market. Holders of excess ACE require price signals to determine optimal sell strategy and, similarly, potential buyers require clear information on the availability and price of ACE.

The purpose of this study is to identify and evaluate the adequacy of the available sources of ACE information for independent (typically small) fishers and larger companies. The role of fish receivers in providing ACE to fishers who supply them is also considered. Fish receivers include fish processors and are referred to in this report as Licensed Fish Receivers or LFRs. An important fishery – snapper 1 (SNA1) – is examined separately as a case study.

The SNA1 fishery is further investigated in Part 2 of this report which measures the extent to which overfished fishers engage in arbitrage¹ as a way of lessening deemed value charges incurred when they are unable to balance catch against ACE.

¹ Arbitrage is the practice of making a financial gain by exploiting an imbalance in a commodity's price in a market, or between markets. An ACE price imbalance is generated through the impact on individual fishers of the deemed value payment system. In the ACE market, an arbitrage transaction is said to occur when one fisher, whose annual catch exceeds their ACE (i.e. the fisher is overfished) buys ACE from a second less overfished fisher. The more overfished a fisher the higher the marginal deemed value levy becomes. The progressivity in the deemed value rate structure occurs in 20 percentile bands, meaning that overfished fishers may be able to reduce a deemed value liability at the higher rate by buying ACE from a less overfished fisher, without the less overfished fisher moving to the a higher deemed value rate.

For example, consider two fishers with equal ACE in the SNA1 fishstock at the opening of the fishing year. Suppose that Fisher A ends the year 105% overfished and Fisher B ends being only 5% overfished. Fisher A is liable to pay a deemed value rate of \$26 per kilogramme on the top 5% of their 105% overfishing, whereas Fisher B is liable to pay a deemed value rate of \$13 per kilogramme on the their 5% overfishing. If Fisher A buys ACE equal to the 5 % overcatch from Fisher B then Fisher A would save \$26 per kilogramme (and move to being 100% overfished) whereas Fisher B would continue to pay \$13 per kilogramme on the additional 5% (and move to being 10% overfished). The \$13 per kilogramme saving by Fisher A is the gain from the arbitrage transaction. It is shared, by negotiation, through the price paid for the ACE bought. The deemed value savings are used, in part, to induce the less overfished fisher to sell ACE to the more overfished fisher.

2 METHODOLOGY

The investigation of the ACE market began with consultations with a wide range of ACE market participants. These included fishers (ranging from small scale to large companies), shore managers, quota brokers, licenced fish receivers, the fisheries data management and industry service provider FishServe, ACE market arbitrageurs, and analysts from the Ministry for Primary Industries (MPI). Fruitful discussions were also held with various industry stakeholders at the 2013 conference of the New Zealand Federation of Commercial Fishermen (NZFCF).

Following the preliminary consultation phase a questionnaire was widely distributed – available online and in print format – through industry contacts and to the delegates attending the NZFCF conference. The online link to the survey was also advertised on the home page of the FishServe website. This website is visited regularly by fishers and others involved with the QMS fishery. For the SNA1 case study the survey was sent by email notification to the majority of ACE holders in this fishery.

3 THE OVERALL ACE MARKET

The survey yielded 114 responses with 41 of these related specifically to SNA1. The overall findings of the questionnaire sent to all ACE market participants in the QMS fishery are set out in this section and the SNA1 findings are set out in Section 4.

3.1 ACE MARKET PARTICIPATION: NATURE OF INVOLVEMENT

Respondents were asked to identify how they were involved in the ACE market, and to indicate their main involvement. Figure 3.1 shows that for most respondents the main involvement in the ACE market was as a fisher.

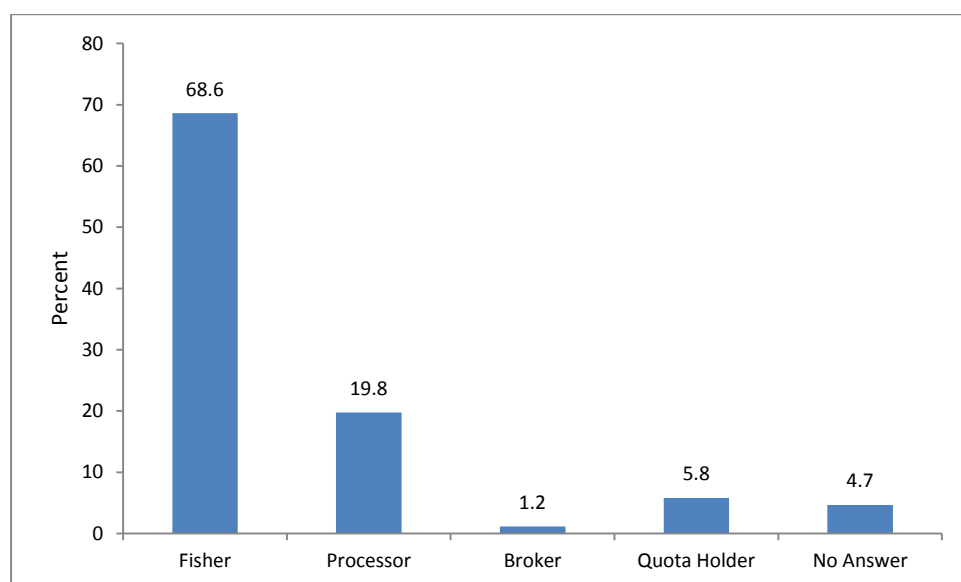


FIGURE 3.1 TYPE OF INVOLVEMENT IN THE ACE MARKET (MAIN INVOLVEMENT)

For the other categories of involvement the Quota Holder category represents participants whose main involvement is the selling of ACE, based on their quota share. A number of respondents reported dual, or multiple involvements, with 30 per cent involved as fisher and quota holders, 4.7 per cent involved as fisher, processor, quota holder and quota broker, and 11.6 per cent involved as fisher, processor and quota holder. Thirty-seven per cent reported that they were exclusively fishers (see Figure 3.2).

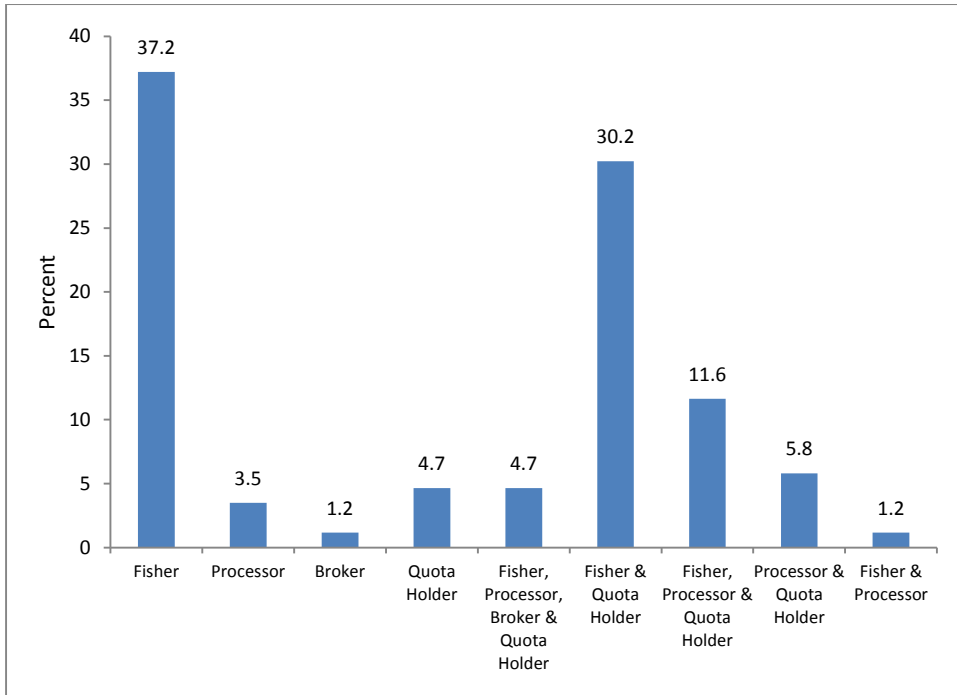


FIGURE 3.2 TYPE OF INVOLVEMENT IN THE ACE MARKET (COMBINATIONS)

Figure 3.3 shows that the great majority of participants have been involved in the ACE market for a considerable time. Time in the industry is likely associated with the establishment of reliable information channels and suggests that long stayers have built effective ACE trading relationships with other industry participants. New entrants (those having been in the industry 3 years or less) would be expected to report greater difficulty in sourcing information on ACE, and in acquiring ACE. The small number of new entrants in the fishery is likely indicative of these difficulties.

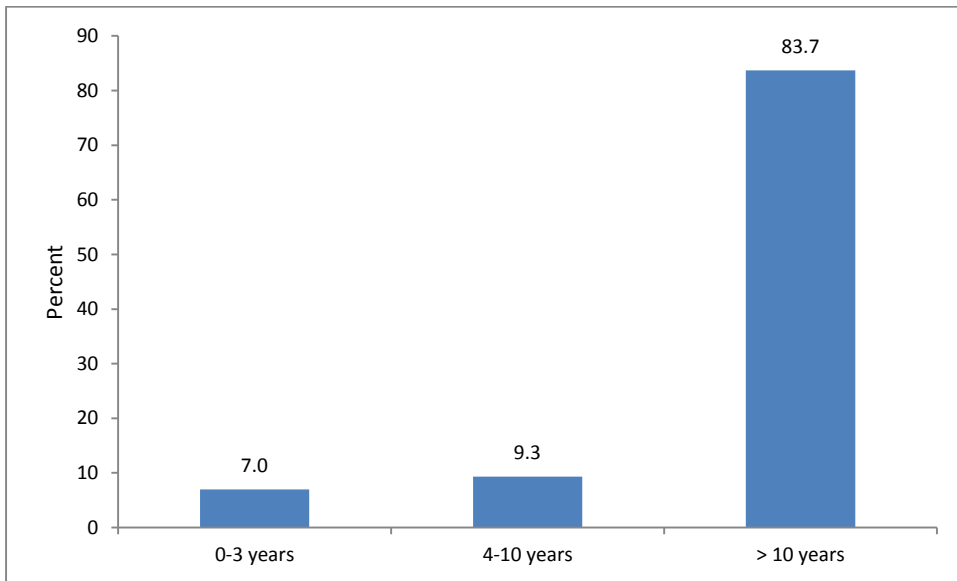


FIGURE 3.3 YEARS OF INVOLVEMENT IN THE ACE MARKET

The number of employees was used as an indicator of size and produced results showing that a broad cross section of industry participants responded to the survey, including two large entities having over 1000 employees along with many smaller operators. This range in scale of operation was also reflected in the results for questions about sales turnover and vessel size.

The survey was also used to establish each participant’s four main ACE fishstocks for revenue generation. The results show a wide range of species are targeted, with key high value species such as snapper, grey mullet 1, flatfish 1 and gurnard 1 featuring frequently.

3.2 ACE MARKET INFORMATION CHANNELS

Figure 3.4 reports on the participant’s propensity to buy and sell ACE. Most respondents are mainly buyers but many are active as both buyers and sellers. A number of participants appear not to be active as buyers or sellers of ACE – these are likely to be fishers who own quota shares and catch only their own ACE.

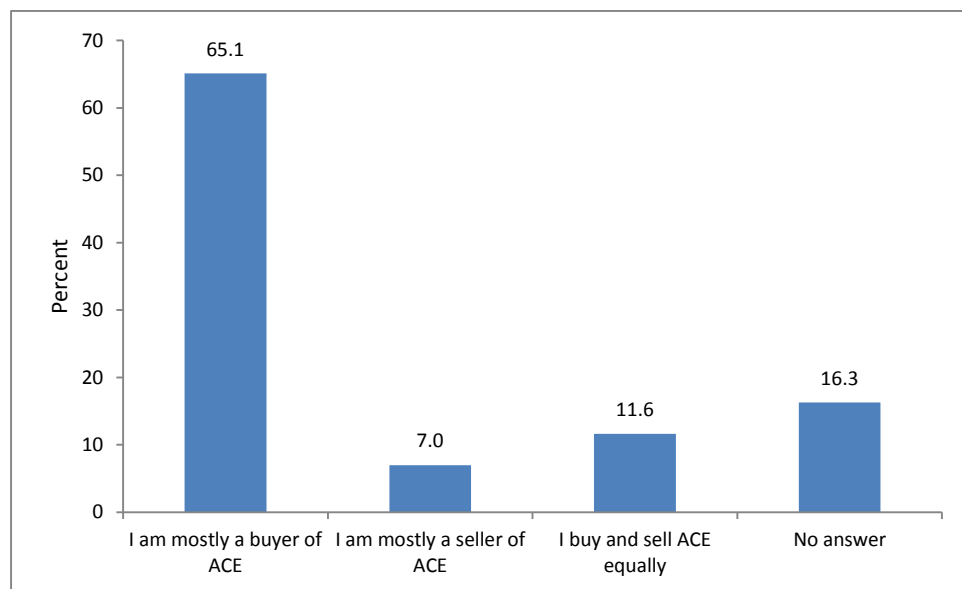


FIGURE 3.4 ACE INVOLVEMENT

Figure 3.5 shows that a variety of ACE market information channels is available to ACE market participants. The primary channel used by a participant is related to the nature of their involvement in the ACE market. Fishers generally have close relationships with LFRs (identified also as processors) and quota brokers. Quota brokers and larger entities are more likely to source ACE information from FishServe FRED – an online search tool giving up-to-date reports on ACE and quota holdings reports². This pattern of behaviour is related to the time participants devote to searching for ACE. Quota brokers devote greater resources to search activity in order to service their ACE buyers. The cost to subscribe to FRED deters some small fishers while smaller

² FRED is an online tool that allows users to run and customise their own set of reports using live up-to-date-data from the Quota Share and ACE Registers via the internet. It gives access to ACE Holdings, ACE Transfer Prices, Catch vs. ACE Comparison, Catch by Month Comparison, Deemed Value Rates, Quota Holdings, and Quota Transfer Prices. Such information helps identify potential sources of ACE.

fishers are also unlikely to have the extensive networks that brokers and large vertically integrated operators have developed.

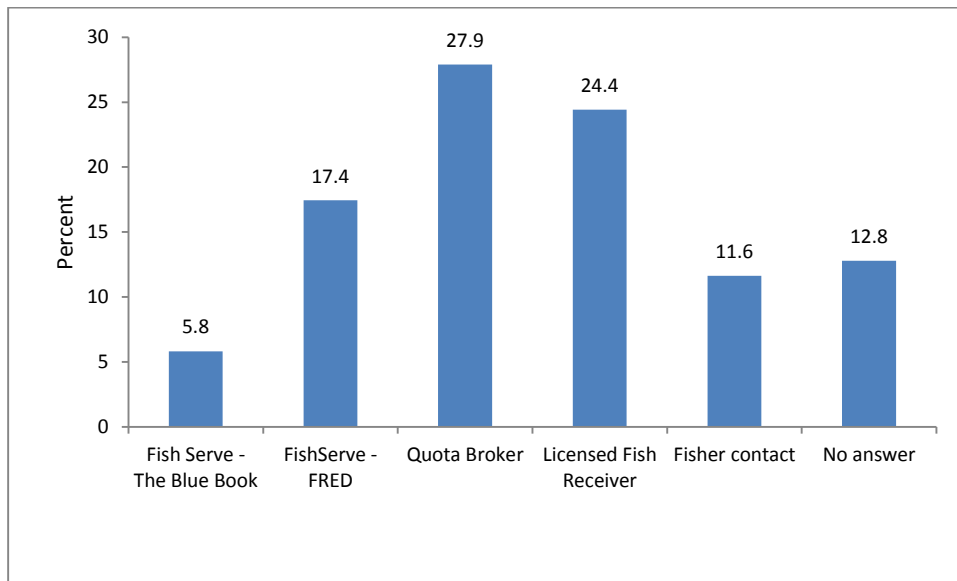


FIGURE 3.5 INFORMATION AVAILABILITY

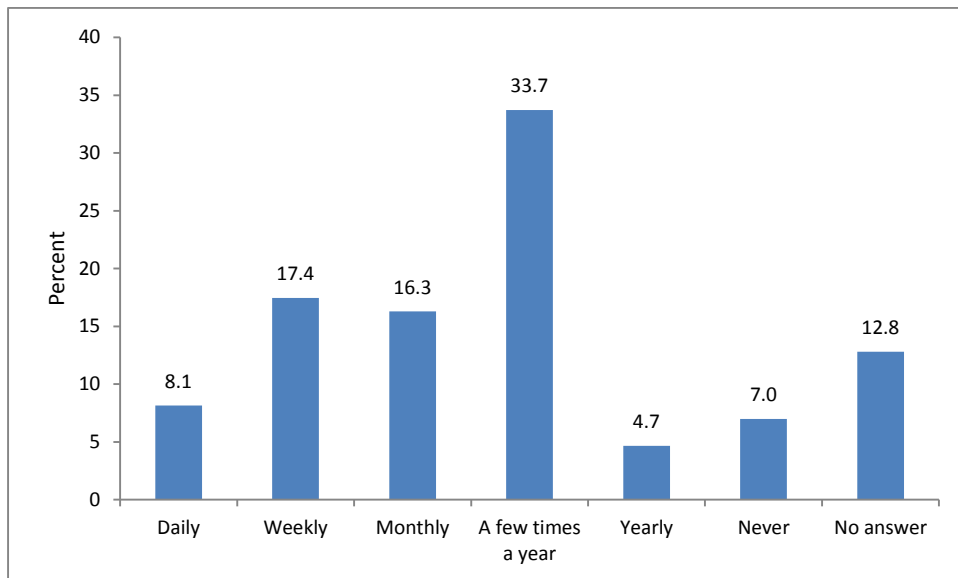


FIGURE 3.6 INFORMATION SEARCH FREQUENCY

Figure 3.6 suggests that information channels for the ACE market are actively used. This is evident from the frequency with which some ACE market participants seek updated information; 8 per cent doing so daily and a further 17 per cent seeking information on a weekly basis. Information search activity by the small fisher was somewhat less frequent; this discussed further below.

3.3 CHANNELS USED FOR SOURCING ACE

ACE market information search channels, such as FishServe's FRED, give indications of who may have uncaught ACE in a fishstock but it is not a direct source of ACE.

Figure 3.7 reports the main sources for acquiring ACE for a fishstock. As anticipated, LFRs are a key source of ACE. The reliance of small fishers, on a LFR for ACE was evident from discussions held with industry contacts and from survey results.

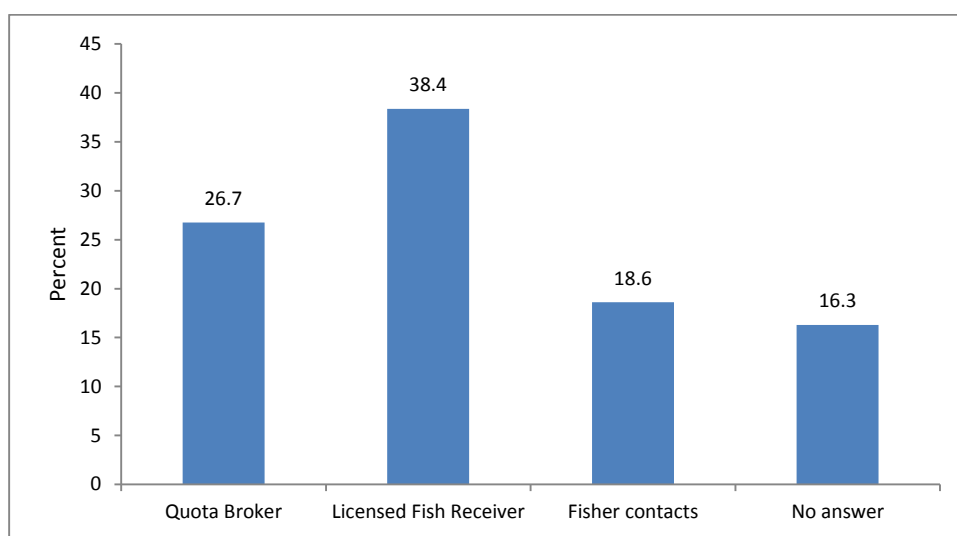


FIGURE 3.7 MAIN SOURCE OF ACE AVAILABILITY

The market for ACE for individual fishstocks varies greatly in terms of demand versus supply positions. Fishstocks underfished by a fisher are often in excess supply, and/or have a low ACE price. This may be driven by the low demand in the market for the fish caught or by difficulties associated with obtaining ACE for a bycatch stock. It is also possible that the total allowable commercial catch (TACC) exceeds what fishers are actually able to catch in the fishing year. Figure 3.8 shows that about one third of market participants had specific fishstock-related ACE for which there was no buyer, this is in line with an ACE market experiencing excess ACE supply over ACE demand. Anecdotally, some fishers remain underfished in a fishstock as a result of the unavailability of ACE in a key bycatch stock, forcing them to stop fishing altogether for the season.

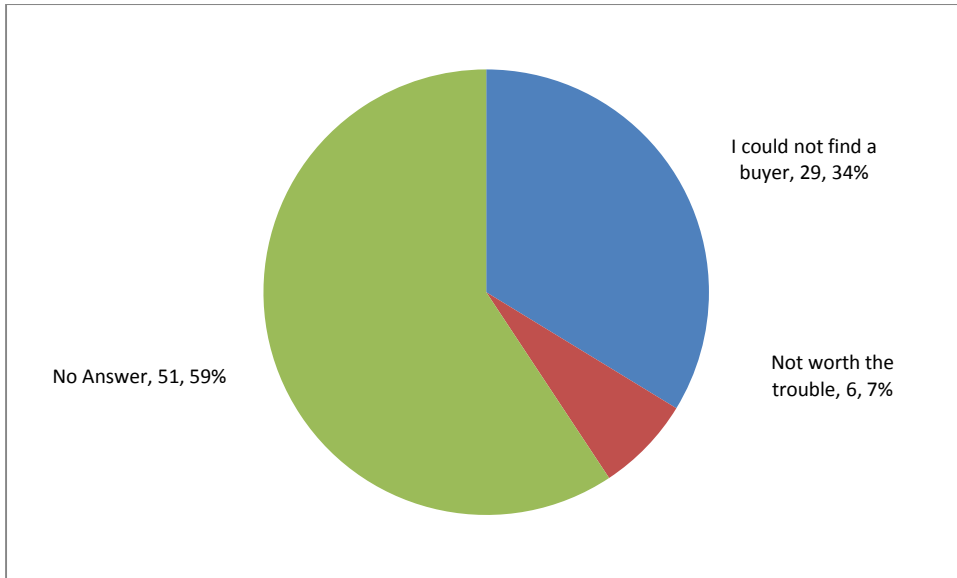


FIGURE 3.8 REASONS FOR NOT SELLING ACE IF UNDERFISHED BY MORE THAN 10%

3.4 ACE MARKET TRANSACTION COSTS

A key characteristic of an efficient market is low transaction costs. ACE market participants were asked to comment on whether transactions were costly to perform, and what the main transaction cost was. The great majority indicated that transaction costs were not costly to perform (see Figure 3.9) with only 20 per cent indicating that transaction costs were a problem. Of those who considered transaction costs to be a problem, the majority (65%) considered financial costs to be the main cause of transaction cost (see Figure 3.10).

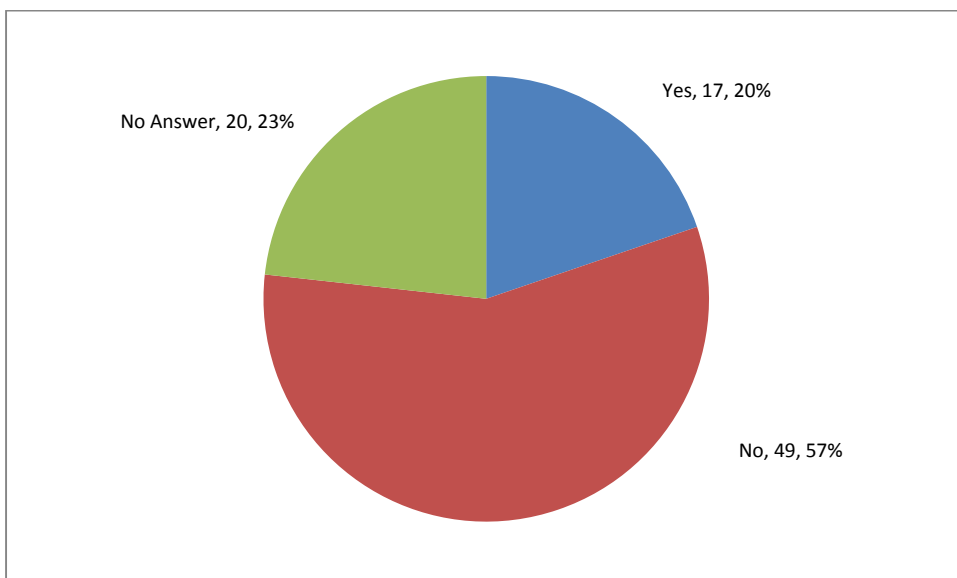


FIGURE 3.9 ARE ACE MARKET TRANSACTIONS COSTLY TO PERFORM?

It is noteworthy that time spent conducting trades is not a factor; indicating that ACE markets are efficient at providing market information, such as price and availability. This is in keeping with the existence of a sophisticated market; having many buyers and sellers, clear price signals and low levels of information asymmetry.

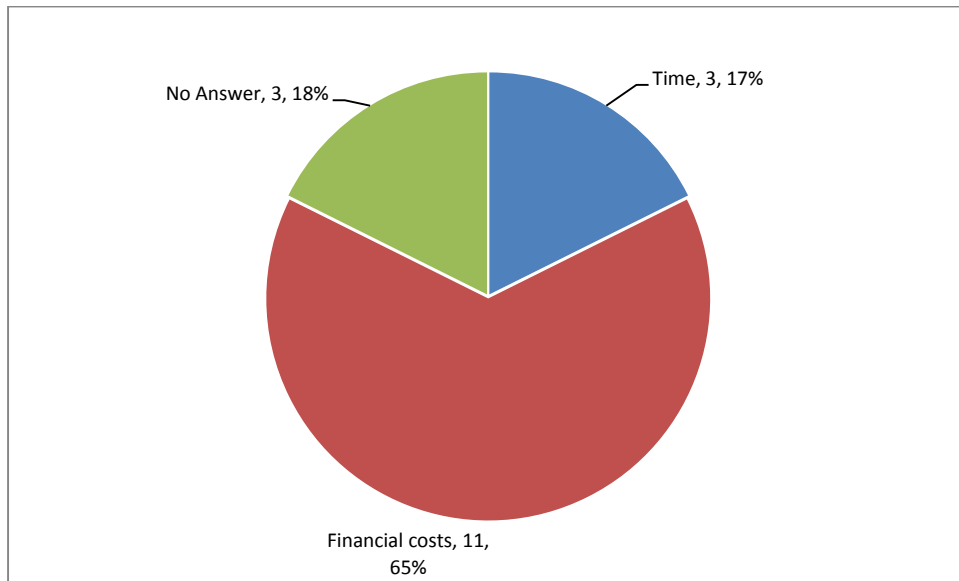


FIGURE 3.10 NATURE OF ACE MARKET TRANSACTION COST

3.5 ACE MARKET COMPARISONS: THE SMALL FISHER AND THE NEW ENTRANT

The overall findings suggest that the ACE market channels utilised by small entities differ somewhat from large fishing entities. Small fishers are mostly buyers of ACE. They have multiple search channels for ACE market information but rely mostly on the LFR and quota broker. In contrast large fishers rely heavily on FishServe’s FRED and direct contacts with other fishers.

The source of ACE market information has been distinguished from the source of ACE. The distinction highlights that although the small fisher seeks information from quota brokers, the main source of ACE is the LFR. This suggests that LFRs play the key role in providing small fishers with ACE, while quota brokers are a secondary source of additional ACE. The frequency of information search by small fisher participants indicated somewhat less frequent search activity, with no small fisher searching on a daily basis.

New entrants to an industry must generally overcome barriers to entry – the absence of barriers being a condition of only perfectly competitive markets. Easy (preferably costless) access to information on ACE price would remove one potential barrier to a new fisher’s entry. The findings indicate that new entrant fishers are more likely to depend on the LFR for information on ACE and for acquiring ACE cover, suggesting that the LFR plays an important role in supporting and facilitating the entry of fishers to the industry.

In summary, respondents to the survey have indicated that multiple sources exist for ACE market information. Small fishers and new entrants appear to have greater dependency on a LFR for both ACE information and actual ACE than larger fishers. This is explained by market structure in the fishing industry – larger fishers operate as vertically integrated firms, catching and processing their own fish, as well receiving fish from other fishers. In general, ACE market transactions are not considered to be costly to perform,

making the transfer of ACE between fishers relatively easy to perform, and thus contributing to market efficiency. The following section examines the operation of the ACE market for the snapper 1 fishery.

4 ACE MARKET SURVEY RESULTS FOR SNAPPER 1 (SNA1)

The preceding discussion looked at the overall fishery – this section concentrates on the ACE market for a single fishery. The Snapper 1 (SNA1) fishery is important as a revenue generator, and is a fishery characterised by a relatively large number of participants, many of whom reported difficulty accessing SNA1 ACE to achieve catch balancing, either when SNA is the target or when it is a bycatch to another target species. The survey attracted 41 responses from ACE holders in SNA1.

4.1 SNA1 ACE MARKET: NATURE OF INVOLVEMENT

The survey responses indicate that a higher number of SNA1 ACE market participants are in the quota holder category compared to the overall quota market (25% versus 6%) (see Figure 4.1). An explanation for this could be the strong demand for SNA1 ACE and consequent high ACE price for SNA1 – making this fishstock a desirable long term investment for retired fishers or others who have acquired a holding of SNA1 quota shares. It is also noteworthy that only one quarter of SNA1 fishers have quota share holdings – a result marginally below that for the overall fishery – making it necessary for the majority of SNA1 fishers to regularly find ACE through the market to balance their catch (see Figure 4.2).

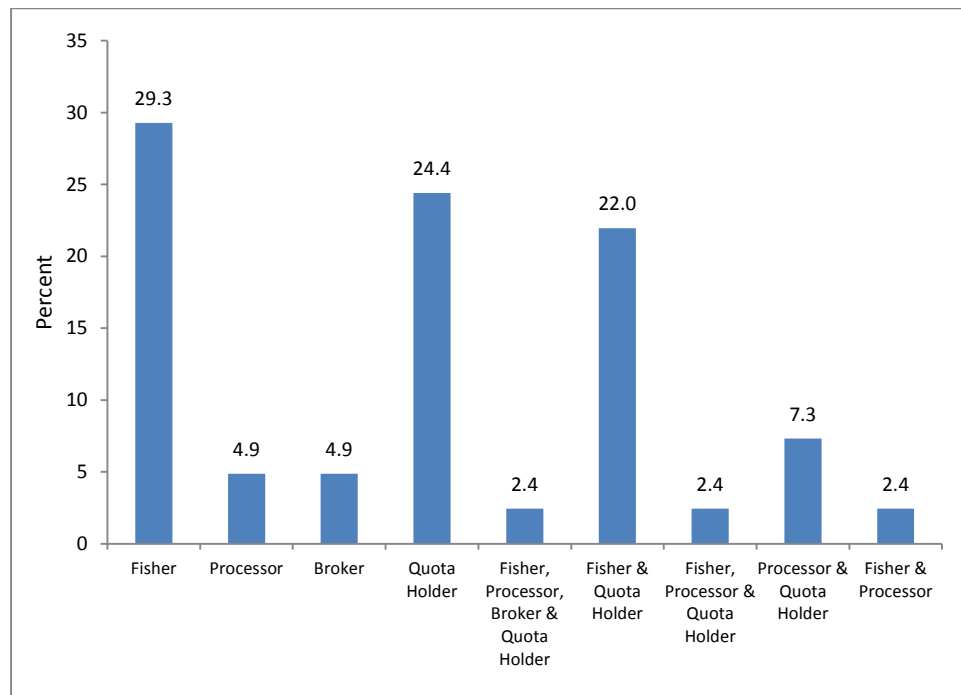


FIGURE 4.1 TYPE OF INVOLVEMENT (SNA1)

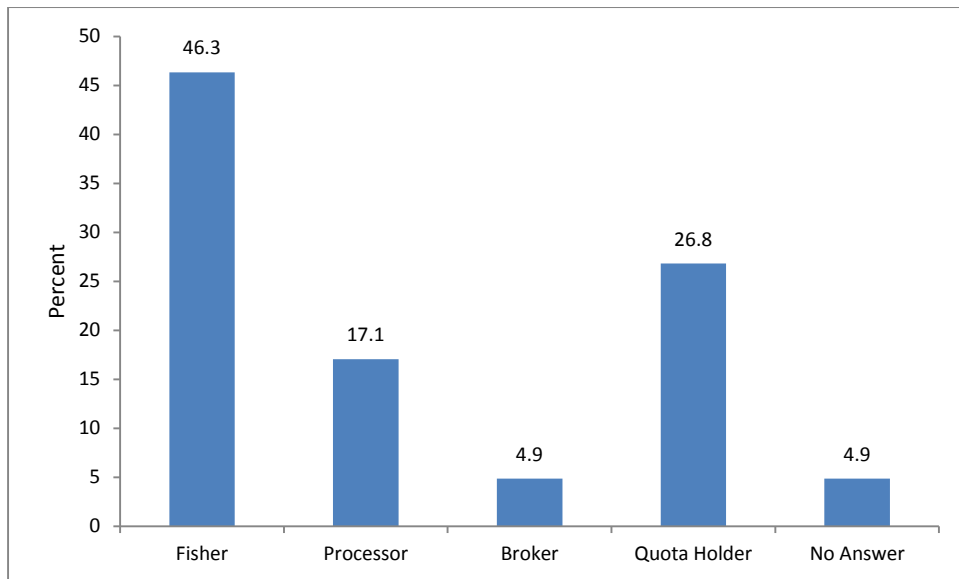


FIGURE 4.2 MAIN INVOLVEMENT (SNA1)

Consistent with the picture for the overall ACE survey, the great majority (85%) of SNA1 ACE market participants have been in the industry for 10 years or longer. The small proportion of new entrants results from the constant TACC setting for SNA1, and consequent high price for SNA1 ACE, making entry to the fishery difficult (a pattern also seen in the industry overall).

The SNA1 fishery has a range of firm sizes co-existing in the fishery, suggesting that economies of scale in this fishery are not substantial. This is also borne out by the existence of a relatively high number of smaller vessels operating in this fishery.

The results to the question asking fishers to list their ‘most important fish stock for revenue’ feature the top retail species: snapper, terakihi and gurnard. Of these it is the cost and availability of SNA1 ACE that fishers report being their principal difficulty. This result also indicates that snapper is either the target species or a key bycatch species for practically all fishers in the SNA1 sample.

4.2 SNA1 ACE MARKET INFORMATION CHANNELS

Information search activity on ACE availability in SNA1 exhibits a pattern similar to that found in the overall fishery study. The exception is that a greater number of respondents in SNA1 reported that they seldom (10%) or never (18%) search for information on ACE availability.

The channels of ACE market information for SNA1 and the frequency with which they are accessed is consistent with the results for the overall fishery; quota brokers and LFRs are key sources of ACE information. Fisher contacts are more important as a source of ACE market information for the SNA1 respondents compared to the overall fishery, possibly the result of the existence of the proximity of local fisher networks.

The LFR is the principal source of ACE, with fisher contacts and quota brokers playing an important subsidiary role; a pattern that was also observed in the overall fishery survey.

Low transaction costs are an important characteristic of efficient markets. The respondents for the SNA1 fishery are in agreement with those for the overall fishery (68% versus 57%) that ACE transactions are not costly to perform and for those that considered transactions costly financial costs were considered to be the main cost (50% versus 65%).

This result is an indication that information channels in the SNA1, and overall fishery, are effective at providing information to ACE market participants. There was no indication of information asymmetries; both parties to the market transaction having ready access to the same information. This is a strong indication that ACE prices reflect all available market information, both for actual data, such as overall catch versus total ACE, and expected end-of-year outcomes – this is another important characteristic of an efficient market.

5 ACE MARKET ISSUES: THE BYCATCH PROBLEM

ACE market participants were asked to comment on the main issues they had with the operation of the ACE market, and how they could see these being resolved. The comments have been presented in Appendix A. They are grouped according to the respondent's main involvement in the fishery, thereby allowing the reader to identify the differing perspectives of fishers, LFRs and quota brokers. The comments from the SNA1 fishery have been shown under a separate heading.

Fishers commented on the difficulty of harvesting their target fishstocks without encountering high levels of bycatch of species for which no ACE was available.

The suggestions for correcting this ranged from simply increasing TACC for key bycatch stocks to amending the deemed value system so as to make the surrender of excess bycatch cost neutral to the fisher

The bycatch issue exists for virtually all finfish fishers operating in the inshore fishery. All report having at least four species that contribute significantly to their revenue. This fact helps to explain why fishers are concerned about the difficulty of acquiring ACE for their bycatch species. Despite various bycatch mitigation strategies, some fishers report being confronted with no other option but the in-season cessation of fishing.

The difficulty in acquiring ACE for bycatch is likely to impact more heavily on the small fisher. Their smaller levels of ACE and narrower portfolio of stocks requires a more finely tuned catch-plan to balance catch with ACE across all species. Failure to balance catch with the ACE held prompts urgent ACE search activity, typically through LFRs and quota brokers, but this is often a fruitless pursuit. LFR's and quota brokers – operating in the same hotly contested market – face the same fixed ACE supply constraint so are often unable to assist. Without the ACE for bycatch, fishers are likely to remain underfished in their target species – an obvious cause of frustration for fishers who are unable to complete the catch of their ACE holding despite a strong market demand for the fish. They may also find it difficult to sell their surplus ACE as other fishers find themselves in the same situation.

The extent to which a fisher is overfished in a fishstock may be related to the deemed value rate applied to that fishstock. In some cases the deemed value rate is low enough to allow the fisher to overfish and still

make a net return on the fish landed, in other cases (such as SNA1) this is clearly not the case. The great majority of fishers overfished in SNA1 are overfished in a number of other fishstocks. In some cases the level of overcatch is immaterial in terms of financial impact but in a number of instances this is not the case. It appears, prima facie, that over-catching is not always the result of the incidental overcatch of a bycatch; there appear to be cases where fishers catch in excess of ACE across a wide and diverse range of fishstocks. These findings would benefit from deeper investigation.

ACE markets for certain stocks have a large number of competing entities, some possessing considerable market power on both the demand and supply side of the ACE market. The shortage of ACE availability in the open market results in the emergence of preferred LFR-fisher relationships as a means of ensuring some continuity of ACE from season to season. But even with these, there is no guarantee that a fisher or LFR will be able to secure sufficient ACE given such a tight market. Market power on the demand side has also been reported by industry participants, in particular the ability of large entities to out-bid smaller entities when tendering for ACE (and quota shares) offered for sale.

Deemed value rates vary considerably across fishstocks, making the penalty for over-catching significantly more severe in some stocks – SNA1 in particular has sharply progressive deemed value rates which ultimately result in penalties many times greater than the landed value of the fish.

The current deemed value schedule for such stocks places fishers at risk of severe financial penalty if a substantial over-catch were to occur. This is clearly a cause for considerable anxiety amongst fishers. Additionally, fishers express great difficulty in successfully competing for ACE in key target and bycatch fishstocks (for example snapper), due to general unavailability and to ACE price being above a commercial viable or breakeven point.

In a final note on the efficiency of the ACE market, the practice of ACE (and quota share) bundling was raised by respondents, whereby entities offer a mix, or parcel, of fishstocks for sale as one lot. Such parcels may be relatively large, with a commensurately large parcel price, meaning that it would be unlikely for a small fisher to have the necessary funds to participate in the tender – even if the excess ACE was to be on-sold. This indicates that the ACE market has elements of a ‘seller’s market’ where non-standardised ‘goods’ are able to be sold because of the absence of competition.

Enquires with industry sources indicate that Iwi Collective Partnerships (ICP) find it convenient to parcel individual holdings of ACE and go to the market as one lot – thereby making very sizeable parcels of ACE. This is also an option used by private quota holders seeking a return on ACE. In addition to the tendency for such parcels to be large, they are also likely to include fishstocks that the buyer is unable to harvest – and may include some uneconomic fishstocks. Bidders would need to have arrangements to deal with this; specialist deepwater operators would have arrangements to place the inshore portion of a parcel with a third party inshore fisher – perhaps having the tender figures prepared by the inshore operator, even though the tender was on the overall package. Similar arrangements would be made for ACE in niche fisheries such as CRA, PAU, and SUR. The inclusion in the package of fishstocks that have little or no value is common practice followed by the vendor entities. Buyers generally place a nil figure against such stocks when determining their overall bid price. It is normal practice for such ACE bundles to be offered for sale by tender at the beginning of the fishing year and often involve rollover facilities for on-going relationships but with an opportunity for annual price adjustment. The practice of ACE bundling has advantages for vendors wishing to reduce transaction costs and would have similar benefits for large fishers but clearly does not suit the small fisher.

Survey respondents were also asked to give their views on how the ACE mechanism could be improved. Suggestions were generally interventionist, such as the formation of a two-tier ACE market, whereby a

proportion of ACE would be set aside for tender amongst small fishers only. The assumption here being that ACE would become more available and affordable – an outcome that would only occur if overall small fisher capacity was in balance with ACE.

However, despite the existing market power of dominant firms, from an economic perspective any redistribution should be justified on efficiency grounds, such as sustainability of fishstocks. Distribution of quota on grounds of equity, or the preservation of a way-of-life, does not align well with strict market performance measures. However, small fishers use smaller vessels and gear types and catch methods generally differ from large fishing operations. These variations may sustain an efficiency-based argument for their continued existence in the inshore fishery, and thus improved access to ACE in key fishstocks but such an argument has not yet been convincingly developed

6 CONCLUDING COMMENTS

This study has demonstrated that the ACE market is efficient at providing ACE price and availability information across a range of entity types participating in the ACE market. Small fishers, larger vertically integrated entities, quota brokers, and quota holders appear to form, and have access to, extensive information networks within the ACE market. These networks, supported by the data management hub FishServe, make ACE market information readily available and at low time and financial cost.

Accessing ACE for purchase is more problematic for many participants. Small fishers rely heavily on relationships with LFRs and quota brokers. Market imperfections in the ACE market are reported, particularly in the control over ACE availability by way of LFR-fisher networks. An insider-outsider dichotomy prevails where fishers with close ties to large LFRs are supported with ACE, in preference to those without ties (independents). Bidding for any ACE available in the 'open market' for key fishstocks is highly competitive, and smaller fishers with shorter payback periods, are generally unsuccessful. Parcelling fishstocks into a mixed package for tender also disadvantages the small fisher. A large proportion of ACE in many fishstocks never enters the ACE market at all as the quota owner fishes the ACE derived from their quota share.

The bycatch problem is ubiquitous and especially problematic for the small fisher. The unavailability of ACE for overfished fishstocks places the fisher in danger of financial ruin due to the penalties incurred through deemed value obligations. Cessation of fishing for the remainder of a fishing-year, even with underfished ACE in the target species, may become the only prudent option. Simplistic solutions, such as increasing TACC, will not resolve the core issue of excess capacity and consequent excess demand for a fixed resource – the ACE. Small fishers without their own quota share, and the resulting ACE, need strong alliances within the industry (such as a LFR with ACE) to furnish them with ACE to balance against catch. Without such alliances they are unlikely to survive.

PART TWO – ARBITRAGE IN THE NZ ACE MARKET: DEEMED VALUE MITIGATION

Objective of Part 2

The objective of part 2 of this study is to measure value of ACE market arbitrage transactions in the New Zealand quota managed fishery and to examine the relationship between deemed value rates and ACE prices for arbitrage-related fishstocks. Arbitrage in this study is defined as ACE trading between two fishers who are both overfished at the completion of the trade.

1 INTRODUCTION

New Zealand's diverse multi-species fishery is managed through a comprehensive Quota Management System (QMS) covering around 100 species. The species are subsequently divided by Quota Management Area (QMA) to end up with over 500 individual fishstocks. Each fishstock has a scientifically determined Total Allowable Catch (TAC) from which a Total Allowable Commercial Catch (TACC) is determined. At its inception the QMS allocated Quota Shares to fishers based on their previous catch history. Each Quota Share represents a one-one hundred millionth share of the TACC. Dividing the TACC by 100,000,000 gives the Quota Weight Equivalent (QWE) for one share and then enables each quota holder to be allocated their Annual Catch Entitlement (ACE).

Each fisher is obliged, under the rules of the QMS, to match the catch for each fishstock with ACE for that fishstock. In a multispecies fishery, such as much of New Zealand's inshore fishery, a fisher will require a portfolio of ACE, for even when targeting a specific species, bycatch is practically unavoidable. At times, even with a portfolio of ACE and a carefully determined catch plan, a fisher will be overfished in a fishstock (or even several fishstocks). It then becomes necessary to look to the ACE market to acquire the ACE to cover the excess catch. If the fishstock is overfished in total by the industry – total commercial catch exceeding total ACE – then the fisher will be unlikely to find ACE available for sale and will therefore remain overfished. This is when the deemed value mechanism impacts on the overfished fisher.

The deemed value mechanism was introduced to provide fishers with a legal means of landing overfished fish while at the same time imposing strong disincentives to overcatch. It recognises the reality that catch versus ACE balancing will not always be achieved and allows a way for fishers to avoid the dilemma of discarding (and potential prosecution) versus landing overcatch (and – prior to the deemed value system – certain prosecution). Today, a fisher landing catch in excess of ACE will pay a deemed value rate per kilogram of fish overfished. This rate increases in thresholds as the percentage overfished increases and is set as a proportion of the port price for the particular fishstock. In some cases, the deemed value rate ends up being several times higher than what a fisher would receive for the fish landed: Deemed value rates can range from being tolerably low to being an 'avoid at all costs' penalty threatening a fishers commercial continuance.

Fishers effectively have a full year to balance their annual catch against ACE. If by end-of-year they remain overfished (unable to access full ACE cover) the deemed value penalties (financial in nature) become binding. Given that deemed value rates increase progressively as the percentage overfished rises, a fisher's incentive to find ACE cover increases in line with the level of overfishing. One unexpected option is to seek ACE from fishers who are also overfished, but at a lower percentage amount and consequentially a lower deemed value rate. In this situation a financial benefit from a form of arbitrage becomes possible.

The potential for a financial gain exists for the overfished ACE buyer in the form of a reduction in the amount of deemed value owing, and to the ACE seller based on a share of the financial relief achieved by the buyer. It is this activity that this report seeks to measure and describe, over the study period: 2006 to 2012.

It is important to note that this activity (which is referred to as *arbitrage*) is not in breach of fisheries regulations – it complies with rules for ACE transferal. It does however result in reducing the deemed value penalty from overfishing, and so reduces the disincentive, associated with failure to balance catch against ACE.

2 METHODOLOGY

Deemed value rates increase progressively, usually in twenty percentile bands to a maximum rate is reached when a fisher is more than 100 per cent overfished. Thus the fisher's incentive for accessing ACE increases in line with the level of overfishing. In a number of fishstocks the TACC is fully, or overfished (catch exceeding total ACE) by the end of the fishing year and unfished ACE is generally unavailable, making deemed value liabilities of overfished fishers unavoidable. Arbitrage may however offer an opportunity to mitigate these deemed value obligations.

By buying ACE from fishers who are less overfished, and therefore face a lower deemed value rate, a more highly overfished fisher can cover some, or perhaps all, of their over-catch at the higher deemed value rate. The saving in deemed value is shared by way of payment for ACE to the less overfished fisher. For example, in Snapper 1 a fisher who is 5 per cent overfished pays a deemed value rate of \$13.00 per kilogramme (kg) whereas a fisher more than 100 per cent overfished pays deemed value at a rate of \$26.00 per kg. The more overfished fisher saves \$26 per kg on each kilo of ACE bought from the less overfished fisher – the less overfished fisher will become more overfished and incur additional deemed value liabilities at \$13 per kg. Effectively the transaction produces net savings of \$13 per kg – so long as the less overfished fisher remains in the 0 to 20 per cent overfished band. There remains a net benefit from arbitrage, albeit decreasing, all the way to the point where the less overfished fisher reaches 100 per cent overfished. The net savings are shared between the two fishers. It is the trading in ACE between overfished fishers that is referred to as arbitrage. An overfished fisher is not able to fully cover their overfished position through ACE acquired by arbitrage; the two-party trading between overfished fishers ceases to offer a net saving once both parties have reached the same level of overfishing.

Data for measuring deemed values arbitrage was obtained from MPI for the fishing years 2005-06 to 2011-12. The fishing year extends from 1 October to 30 September of the following year with fishers able to trade ACE from 1 October to 20 October of the following fishing year. Using the MPI data, all overfished fishers for all October fishstocks, were identified. All ACE trades between overfished fishers from 1 October to 20 October were identified and recorded on a species-by-year basis. The fisher's level of overfishing, and the applicable deemed value liability, was determined for the ACE balance prior to each arbitrage transaction. The post-arbitrage ACE-versus-catch position was then compared to the pre-arbitrage position, enabling the

result of the arbitrage transaction to be calculated: an increase in deemed value for the less overfished ACE vendor versus a decrease in deemed value for the more overfished ACE purchaser. Together, the two-party result gives the net saving from the arbitrage transaction. In order for ACE arbitrage to produce a saving there must be a variance in the level of overfishing – having both fishers at the same rate of overfishing, and therefore the same deemed value rate, does not allow for an overall savings in deemed value from arbitrage, and so no incentive to trade exists.

In some cases a fisher may have been underfished prior to the arbitrage transaction but overfished as a result of it – in this case only the portion of ACE sold that put the vendor into an overfished position was considered to be arbitrage. Correspondingly, the amount of ACE attributed to the overfished ACE buyer was also limited to the portion of the ACE sold that had become 'overfished'.

In the first four years of the study period a service offered by Fishtech Ltd facilitated many of the arbitrage transactions, its stated aim being: "optimising ACE distribution to retain industry value" [1]. Fishtech was used by fishers as a means of finding ACE trading partners – both regular ACE trades (such as underfished to overfished fishers) and arbitrage trades were conducted by Fishtech. Savings from ACE arbitrage transactions arranged via Fishtech were shared equally between the fishers in each of the ACE trades, less a small commission paid to Fishtech.

Fishtech transactions often involved the pooling of ACE where ACE for a fishstock was acquired from multiple fishers and then sold to one, or a smaller number, of fishers (and vice versa). In the analysis of deemed value saving, Fishtech transactions involving ACE acquired from underfished fishers were netted-out from pooled arbitrage transactions. Where ACE sold in a transaction with Fishtech was partly underfished and partly overfished an adjustment was made so that only the overfished portion was counted as arbitrage. All Fishtech transactions were arranged to take place in last three days available for end-of-year ACE balancing (i.e. 13-15 October). All direct two-party fisher-to-fisher trades between overfished fishers, facilitated by Fishtech as intermediary, have also been included in the measurement of arbitrage activity and savings.

Fishtech was the only ACE market intermediary set up to assist fishers engage in ACE trading – both the typical, underfished to overfished, and the overfished to overfished arbitrage ACE trades. Fishtech discontinued its operations after the 2009 fishing year; it had been in operation from 2003.

3 RESULTS AND DISCUSSION

Over the seven year study period, fishers have achieved around 1.766 million dollars of savings in deemed value obligations through arbitrage arrangements with other fishers. The number of transactions has declined over the study period, from around 200 trades in the 2005-06 fishing year to only 23 in 2011-12. While the overall magnitude of savings declined steeply from the beginning of the study period, an upturn occurred in the final fishing year (2011-12) due to arbitrage activity in one key fishstock – LIN7. The pattern of decline in arbitrage activity (and deemed value mitigation) is matched by a decline in the overall level of annual deemed value liabilities invoiced by the Ministry. Apart from unusually large arbitrage transactions for LIN7 in the 2011-12 fishing year, the level of arbitrage saving as a percentage of annual deemed value invoice total has also declined (see Table 3.1)

Arbitrage Fishstock (FS)	Deemed Value (DV) Savings							Total DV Savings per FS
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	
BAR5	122,656.71					57,530.09		180,186.80
BAR7		177,615.73						177,615.73
BCO2					34.71			34.71
BCO3	78.74	191.68				12,360.94		12,631.36
BCO4			4,484.39					4,484.39
BNS2	87.72							87.72
BYX2	5,774.61	10,113.52		6.64		0.40		15,895.17
ELE3						18,492.59	980.10	19,472.69
ELE5							188.50	188.50
EMA7	3,548.95							3,548.95
FLA1	1.49							1.49
GMU1						17.47	31.46	48.93
GSH4							7,129.30	7,129.30
GUR3	24,269.03	13,859.95			5,224.94			43,353.92
GUR8	1,065.82							1,065.82
HOK1	185,387.76							185,387.76
HPB3	12,364.55	3,513.61		3,986.82				19,864.98
KAH1						1.00		1.00
KAH2				55.29				55.29
KAH3	14.79							14.79
KIN2	423.91		389.38					813.29
KIN7	212.53	6,321.42						6,533.95
KIN8	2,007.09	1,870.42	25,609.57					29,487.08
LIN1	9.80					3,421.80		3,431.60
LIN5			6,550.60				1,027.62	7,578.22
LIN7	189,464.10	18,877.11	12,680.58	2,374.05		5,567.45	356,907.22	585,870.51
MOK1						812.69	147.14	959.83
OEO4	3,136.69	15,272.83						18,409.52
ORH2A		1,357.44					5,245.60	6,603.04
ORH2B			2,423.15					2,423.15
ORH7B		253.44	1.09					254.53
PAU5B			540.00					540.00
RCO2							0.60	0.60
RCO3							13,067.40	13,067.40
RCO7		24,999.33						24,999.33
RSK7					0.16			0.16
SCH7				940.43				940.43
SCH8	0.00			63.00				63.00
SKI1	64.10		590.03			201.42		855.55
SKI2		2,992.66						2,992.66
SNA1					318.24			318.24
SNA2	10,975.32	686.88					27,438.00	39,100.20
SNA7		1,179.03		117.90				1,296.93
SNA8	86,538.19	782.17						87,320.36
SPO2			26,301.93	1,505.74	5,856.84	1,903.39	1,784.60	37,352.50
SPO7		1,154.94	80.60					1,235.54
SQU1T	0.88							0.88
SSK1					8.82			8.82
STA5	27,436.45	60,872.57						88,309.02
STA7	14,348.04	18,853.65	16,304.79					49,506.48
TAR2	1,137.60							1,137.60
TAR4			715.01					715.01
TAR7	30.88	5,443.59						5,474.47
TAR8	45,085.19	1,575.67						46,660.86
WAR3	28,566.83	2,246.99						30,813.82
Total DV Savings	764,687.77	370,034.63	96,671.12	9,049.87	11,443.71	100,309.24	413,947.54	1,766,143.88
Negative DV Savings								
BYX2			-57.75					-57.75
GUR2					-1,386.03			-1,386.03
GUR3				-5,640.83				-5,640.83
JMA7						-3.26		-3.26
KAH8	-94.03							-94.03
MOK1	-2.50							-2.50
PAU5A		-3,158.40						-3,158.40
SFE20		-2,221.12						-2,221.12
SKI1					-4.50			-4.50
SPO7							-20.57	-20.57
TAR2					-34,256.53			-34,256.53
TRE2					-2.85			-2.85
Total Negative DV Savings	-96.53	-5,379.52	-57.75	-5,640.83	-35,649.91	-3.26	-20.57	-46,848.37
Total Net DV Savings	764,591.24	364,655.11	96,613.37	3,409.04	-24,206.21	100,305.98	413,926.97	1,719,295.51

TABLE 3.1 DEEMED VALUE SAVINGS BY FISHSTOCK AND YEAR

The discontinuation of the arbitrageur Fishtech coincided with a drop in the number of arbitrage trades. According to the manager of Fishtech, it was evident that demand for the service was declining, as is borne out by the decline in overall number arbitrage trades from 2006 to 2009 – a period when Fishtech was operating. Therefore, discontinuation of the service in 2009, while no doubt contributing to the fall in arbitrage activity, does not fully account for the decline in the number of trades. In assessing all deemed value saving by arbitrage it was found that Fishtech facilitated about one third of the savings – the remainder being direct fisher-to-fisher trades. It is also noteworthy that the majority of Fishtech facilitated trades were non-arbitrage trades.

In a small number of fishstocks, the transactions between overfished fishers resulted in an overall negative saving outcome. These cases have been separated from the positive saving outcomes and are shown at the base of Table 3.1. In some instances the negative-sum trades were between a Licensed Fish Receiver (LFR) and a fisher (such as for KAH8). In these cases the LFR sold ACE to their overfished fisher-supplier even though the LFR was also in an ACE-deficit position, the likely motivation being to maintain and support the fisher-LFR trading relationship.

In the case of TAR2 (2009-10) a single ACE trade resulted in a net increase in deemed value liability (i.e. negative saving) of \$34,256.53. Discussion with industry sources indicated that fishers may at times receive ACE in advance of payment, effectively having ACE on loan until payment is made at an agreed future date. Such an arrangement was in place in the case of TAR2 but non-payment by the fisher resulted in the ACE being repossessed – the ACE market agent, acting for the ACE vendor, reversed the ACE trade and thereby put the overfished fisher into a significantly more overfished position and thus increasing the fisher's deemed value owed. The case of GUR2 (2009-10) involved the very same fisher-agent scenario and resulted in forfeiture of GUR2 ACE and an increase in deemed value.

In reporting deemed value saving it was decided to focus on arbitrage trading that produced a positive-sum result. The few instances of ACE trades between overfished fishers that resulted in negative-sum trades were not conducted for the purpose of arbitrage (i.e. deemed value mitigation) and thus would give misleading results if included. This is especially so in the case of TAR2, where if the forfeiture-trade were included, it would overwhelm the positive savings from arbitrage trades for the all-fishstock total for the 2009-10 fishing year.

It is apparent from the data showing all overfished fishers, that only a very small percentage of overfished fishers engaged in arbitrage transactions, and consequently, it is likely that a sizable amount of untapped arbitrage related deemed value saving exists. Measurement of this would be possible from the existing data but this analysis was outside of the scope of this study; it may warrant further investigation.

The results presented in Table 3.1 indicate that arbitrage does not take place on a regular, year-by-year basis for the majority of fishstocks. This suggests that arbitrage is not systematic or premeditated to support overfishing but rather it is a relatively infrequent cost-reducing action, carried out after normal catch balancing efforts have failed. Interestingly, SNA1, which is problematic for fishers seeking ACE for balancing, does not feature strongly in the arbitrage results.

Arbitrage activity does however occur with some year-to-year consistency for certain fishstocks. Two examples of fishstocks that stand out as consistent subjects for arbitrage are LIN7 and SPO2. The level of savings and the frequency of trades in LIN7 make it worthy of some further discussion.

3.1 THE CASE OF LING 7 (LIN7)

The Ling 7 (LIN7) fishstock exists on the West Coast of the South Island (WCSI) – an important hoki fishery. Ling live near the seabed but are understood to come up the water column when feeding on hoki, especially

during the hoki spawning season, and consequently end up as bycatch to the hoki and hake trawl fishery. They are also fished as target species by both trawl and longline methods. However in LIN7 they are caught mainly from target hoki tows. Hoki TACC's have been increasing since 2009 (most recently in 2013 by 20,000 tonnes to 150,000 tonnes) and as a result ling bycatch from the hoki target fishery has also increased. Ling TACC was increased in 2013 (to 3080 tonnes) to reflect its increased abundance (stock levels are estimated by MPI to be as high as 70 per cent of the biomass that would exist in the absence of fishing). The previous increase was in 2009 to 2474 tonnes.

The 2010 NIWA study by Sira L. Ballara et al. [2] shows that ling, on average (for fishing years October 2000 to September 2007) accounted for about 2.3 per cent of the combined hoki, hake and ling trawl catch in the WCSI hoki, hake and ling fishery. This suggests that on average ling make up a 2.3 per cent bycatch per trawl tow. Clearly, cessation of fishing because a fisher's ling ACE was fully fished would come at a considerable financial cost in terms of hoki and hake catch and revenue foregone – assuming their hoki and hake ACE was not fully fished. This situation helps explain why LIN7 was fished to 111.49 per cent of ACE in 2011-12.

The relative size of the hoki versus ling fishery suggests that although the cost of incurring deemed value charges on excess ling bycatch is substantial (the highest by far of any fishstock in 2012 at over \$1.05 million for LIN7) the return to the hoki catch would still be financially viable. The export revenue from processed hoki is around \$170 million. One of the principal arbitrageurs in the LIN7 fishery is also the single largest quota holders of hoki with a 30 per cent holding. The financial position suggests that fishers have some tolerance for incurring deemed value charges. And fisher knowledge that the ling stock is not under any threat of depletion – an important consideration from a sustainable resource stewardship perspective – may contribute to the tendency for some overfishing.

Nevertheless, there is always an incentive to reduce costs whenever possible. The fishing entities associated with LIN7 arbitrage in 2011-12 were able to mitigate their overall deemed value liability by around \$350,000 – a substantial percentage reduction of about 33 per cent. The majority of fishers engaged in the arbitrage for this fishstock are closely aligned in the WCSI hoki fishery, a situation conducive to arbitrage arrangements for the bycatch stock ling.

3.2 ACE PRICE AND DEEMED VALUE RELATIONSHIP

Another area for consideration is the impact that ACE shortfalls, and the consequent deemed value rates that impact on fishers have on ACE price. In overfished fishstocks that have high deemed value rates relative to the landed (port) price, fisher competition for unfished ACE would likely see escalating ACE prices. However, the limited ACE trade price information that is publically available does not give evidence of a sharp upturn in ACE price at the critical end of year catch balancing window. Of all the fishstocks with recorded data on ACE trade price for 2011-12 only three stocks (JDO7, KAH8 and LIN1) show signs that end-of-year competition might have forced a rise in ACE price (see Appendix C).

The evidence of price competition for these stocks was determined by comparing the 2012 year-to-date highs for ACE price for the month ended August with those for the month ended September. JDO7 ACE price high went from \$2702.2 to \$2993.3 per tonne, KAH8 from \$500 to \$600 per tonne and LIN1 from \$2000 to \$2100 per tonne. While none of these fishstocks were subject to arbitrage trades in the fishing year selected they were all over 90 per cent fished suggesting tight ACE markets. However, discussions with industry stakeholders suggest that yearly arrangement for ACE trades are more likely to be rollovers of on-going arrangements based on long-standing relationships. In these situations prices are formed through negotiations that take place between the trading parties, rather than in an auction market scenario open to, potentially frantic, multi-party bidding.

Notwithstanding the above, some evidence of a deemed value to ACE price relationship are observed. The ACE transfer prices recorded in the publicly accessible FishServe database are unreliable, with often only a nominal amount being reported by fishers, and in many instances no entry at all. Bearing this limitation in mind, the figures recorded in the ACE transfer price records show wide variances between the low and high price per tonne paid in ACE trades. Often the high price can be two or three times the low price for the year. In the case of LIN7, 2012 saw a considerably higher year-end 30 Sep 2012 average ACE per tonne price (\$1810.50) than that for LIN1 (\$1061.40) LIN2 (\$789.70) LIN3 (\$819.70) and LIN5 (\$1191.50) fishstocks – clear evidence of the of the importance of having LIN7 ACE for balancing this bycatch to the WCSI hoki fishery, and the shortage of LIN7 ACE. LIN5 was also close to overfished and subject to ACE arbitrage in 2012. It has the second highest average price per tonne, and the second highest high-price, giving further evidence suggesting ACE market excess demand and deemed value differentials are driving up ACE price.

LIN7 ACE price average in October 2012 was \$2298 (up from \$1810.50 the previous month and \$1999.50 in October 2011). The bycatch and consequent ACE balancing issues experienced in LIN7 are in fact impacting on ACE demand and price. The fact that ling is predominantly an export fish also suggests that it is not variances in local market demand for the fish that is influencing ACE price but rather the dynamics on the supply side, particularly ling being a bycatch to the large volume hoki catch.

In an attempt to establish whether fishers in the arbitrage related fishstocks may have opted to pay deemed value rather than buy ACE, a comparison was made of deemed value rates to port price for fish and ACE price. If ACE price is higher than the deemed value rate, fishers without ACE may simply pay deemed value, and in the process save money. Given that deemed value arbitrage is an end of year activity, it was decided to compare the lowest level of deemed value with the highest ACE price for the year. The rationale being that an overfished fisher would face the higher ACE price at year-end for any ACE still on the market. The results from this comparison show that in some fishstock a fisher would have an incentive to pay deemed value rather than buy ACE for at least the first threshold of overfishing (see Appendix C - grey shading). When comparing the highest deemed value rate to the highest ACE price the situation is quite different. In all arbitrage related fishstocks the highest deemed value rate is substantially higher than the highest ACE price. This suggests that while a fisher may have a financial incentive to remain overfished by a small percentage (say by 10 per cent) rather than pay for ACE there is a substantial disincentive to engage in significant (say 100 per cent) overfishing rather than buy ACE. It is important to note, however, that in the majority of the arbitrage related fishstocks, overall industry catch versus ACE is greater than 100 per cent meaning that there is unlikely to be any ACE to buy, making arbitrage the only possible option for an overfished fisher seeking some relief from deemed value obligations.

The other variable in assessing fisher incentives to overfish is the price received for the landed fish (port price). This analysis is somewhat inconclusive due to the absence of reliable price data for fishstocks – port price received is generally believed as being understated by fishers; see for example Stewart and Callagher 2013 [3]. There will also be variances in return to fishers for fish caught resulting from the nature of their operation, such as supplying to a LFR versus a vertically integrated firm processing and exporting its own catch. Clearly in certain fisheries, such as ling and rig, the returns from the target species are sufficient to absorb the deemed value penalty from at least some level of overfishing of the bycatch.

Appendix C (which is limited to fishstocks that were subject to arbitrage activity) shows that for most fishstocks port price exceeds the lowest deemed value rate, meaning that at low levels of overfishing fishers are at least able to cover the deemed value incurred with the port price received; a satisfactory situation if overfishing was in a bycatch. The situation is quite different for high levels of overfishing, incurring the highest deemed value rate; here the port price for the great majority of fishstocks is below the deemed value rate, making overfishing costly. It is in these cases that arbitrage may be a worthwhile strategy.

3.3 POLICY ADJUSTMENTS

The regular review of sustainability measures and management controls for fishstocks conducted by the Ministry for Primary Industries (the 'Ministry'), aims at setting deemed values and TACC at levels that ensure fishers have strong incentives to balance catch with ACE. To achieve this aim regular adjustments are made, as considered appropriate, to deemed value and TACC for fishstocks. For example *HO454 Notice of Decisions* [4] the Ministry made adjustments to TACC levels and deemed value rates to a number of fishstocks (including some that were subject to arbitrage) so as to better align fisher incentives with the sustainability goals of fisheries management. It is expected that these, and similar adjustments, have contributed to the declining trend in deemed value invoicing (i.e. overfishing) and may have directly contributed to the decline in arbitrage activity. It is also believed that fishers have refined their own catch management strategies, such as dynamic catch- plan adjustment, to avoid or at least mitigate overfishing.

However, in such a dynamic operating environment (such as variance in fisher effort, and uncertainty of stock size through variance factors such as fishstock recruitment levels) it is unlikely that fine-tuning of TACC and deemed value rates could eliminate overfishing.

A case that illustrates this is the SPO2 (Rig) fishery which is a bycatch to a number of target fisheries (tarakihi, red gurnard, flatfish, blue warehou and blue moki). In their Rig 2 (SPO): *Final Advice Paper* [5] the (then) Ministry of Fisheries recommended that SPO2 TACC be increased from 86 to 108 tonnes, effective from the 2011-12 fishing year so as to enable fishers to maximise value in SPO2 and associated target fisheries and reduce their deemed value payments. This adjustment, while no doubt helping, did not eliminate overfishing with deemed value invoiced at \$51,545 for the 2011-12 fishing year and the related arbitrage activity leading to deemed value saving of \$1,784.60.

4 CONCLUDING COMMENTS

ACE market arbitrage plays a role in reallocating ACE to fishers who are most highly overcaught. It has the effect of reducing the deemed value rate on a portion of the overfished catch but cannot, by definition of arbitrage, eliminate all deemed value incurred from overfishing. In reducing the cost of overfishing it may contribute to a higher level of overfishing of a fishstock than would otherwise be tolerated by fishers.

The practice of arbitrage does not appear to be widespread, and is declining. In recent fishing years, arbitrage saving is substantial in only a small number of fishstocks, most notably the bycatch stock LIN7. Over the seven year study period total deemed value saving through arbitrage trading in ACE amounted to about 6 per cent of the total deemed value invoiced for the arbitrage related fishstocks.

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APPENDIX A – ISSUES AND SUGGESTIONS (UNEDITED) – OVERALL FISHERY

Fisher	Issues	Suggestions
F1	<p>Availability or finding available ACE. Many ACE holders sit on ACE in case they may need it later, then at the end of the year when you havnt much hope of catching it before year end they put it up for lease. I have also seen examples of where a species is in big demand to cover by-catch, of people sitting on ACE to lease it out at year end for more than the catch value to cover people with massive over-catch deemed value bills. With species like ELE5 it is easy to be over 200% overfished if you have a small ACE holding and looking at a deemed bill of 3 times the catch fee so you are better to lease for 200% of the fishes value then pay a 300% deemed bill. The only other option is to dump that species which is illegal. This may be good business for quota owners but does nothing for stocks and fishers.</p>	<p>As it is private property you cant force people to make it available but with the companies that allocate ACE to fishers they should have a system where if you havnt met certain catch targets throughout the year without a good reason you should surrender what you are behind. If you dont and it doesnt get caught then you should be responsible for the ACE fee. With species like ELE5 it should be issued as a by-catch species and targeting only okayed when by-catch requirements are met. Quota increases dont help those who have low ACE holdings of a species, as one fisher I know said when you have bugger all ACE a 20% increase of bugger all is bugger all.</p>
F2	<p>Cost of ACE compared to port price Ramped deemed value and stock abundance in some fishstocks keep pushing up ACE prices (we tender prices that are unconditional at times just to try and get ACE to cover bycatch and still don't have the winning tender. Fishstock TACCs need to work together, e.g. huge FLA7 TACC means more boats fishing in that area than there is available bycatch of SNA7 to cover ACE has become an investment for people outside of the industry and they want best return for their investment. I can understand this, but we are heading towards a situation where there won't be any boats to catch the fish because no one can afford to invest in new boats.</p>	<p>Stop bowing to political pressure when science proves otherwise. TACC should be set irrespective of what Greens, recreational fishers and big companies think and be solely based on state of fishery (up or down) so the fishery can be utilised to its full potential without putting any fishstock at risk. Possible bycatch trade-offs for "genuine bycatch" for some species? In season increase/decrease at appropriate time. MPI needs to be able to make faster decisions. Possible "surrender" of some species so we can fish where the main concentrations of target species are without deem value of by-catch making it uneconomical. Our FLA7 and GUR7 catch is very down on what it could be because there is now too much SNA7 in our traditional fishing areas and we can go there. Thank you. Good luck. x</p>
F3	<p>Large fishing companies have the monopoly. Foreign charter vessels will outbid any small company on price as they can make a 400%+ profit on selling our fish overseas. ACE market allows a lot of cowboys to operate, not having any allocated ACE to go fishing but being able to sell their fish privately at market to cover deem value. Maori owned companies only operating foreign charters.</p>	<p>Maori should have to offer their inshore ACE to New Zealanders first before being allowed to give it to foreign vessels. Large foreign vessels operating in the JMA Fisheries should only get the last choice on any valuable inshore bycatch species, as they can afford to pay huge deem values, even though they won't like the idea. Bring back bycatch tradeoff.</p>
F4	<p>It has draconian punitive laws. Confiscation of quota fishing vessels and jail terms. And with the small amounts of ACE available and ramped deem values there is no other option for fishers in an industry that has fishers with alot of experience leaving in droves with no one replacing them and a fishing fleet that is ageing and no owner operators being able to afford to replace their vessels. I think the limited SNA ACE and abundant stocks is a perfect storm of mismanagement. I rack my brain to try and think of something that could make it worse than it already is and I can't think of anything. Lease prices higher than the fish price, ramped deem values and extremely tough punishment for non-compliance to protect a fish stock that is hard to comprehend its true size. In Europe the cods stock are recovering well, so when fishermen catch their quota they have to dump dead fish back into the sea. This drives the European fishermen nuts - no fishermen goes to sea to dump fish. But in NZ we have an even sillier system. Fishermen have to pack and process and ice fish, time consuming and hard work and then pay to land it!!!! Options for fishermen with deemed values higher than you get paid for the fish and are ramped up from there. 1 Pay to land snapper - go broke 2 Tie boat up when snapper ACE is caught - go broke 3 Dump fish - lose everything - go to jail These are the options available to NZ fishermen who are very hard working people in the most dangerous job in the country. People who are</p>	<p>This is easy to fix - Double snapper ACE, scrap ramped deem values, set deem values at port prices, apply the aggregation clause in the original quota system, so fishermen without ACE can source it and major fishing entities don't get all the ACE. Also in the original format of the quota areas there was an area 8 snapper that stopped at Tirua point which is between Awakino and Kawhia and the area above that was Area 9 snapper. Alot of the ACE that was caught on Nelson/Wanganui and New Plymouth trawlers were all caught south of Tirua Point, alot of this quota has since been sold on to fishers in the northern part of Area 8, so there is very little ACE available in Taranaki. So reintroducing an Area 8 and Area 9 snapper would help reduce the huge amounts of snapper in the southern end of Area 8 snapper. Is this going to happen? Yeh right! Benefits of this happening - increased GDP, increased local economy, particularly small coastal areas around NZ, increase in jobs, increase in taxes, increase in ACC levies, and if the Govt held the ACE increase in lease levies for them and you would actually get an increase in deemed payments because fishermen could land the fish and not lose money. Some of the detail supplied in this survey may not be entirely accurate because I havn't had the time to research this information fully but I promise you the figures are not far off the mark. I find the ACE system frustrating which is probaly evident from what I have written and makes my job as a fishermen extremely</p>

<p>passionate about what they do, create alot of employment, pay taxes and stimulate our economy. This is just ridiculous!!! A BRIEF HISTORY OF THE SNAPPER FISHERY AROUND NZ 1950-1960 Small NZ trawlers with low horse power catching small amounts of snapper with a 3 nautical mile territorial limit. Large Japanese mother ships with small dories setting mile upon mile of long line for snapper. 1960-1970 Huge Japanese trawlers fishing around NZ raping our snapper stocks. The biggest trawler in the world at the time was built in Japan for the purpose of coming to NZ and catching our snapper. 1970-1980 Pair trawling by NZ fishermen, this caught snapper but the biggest impact on the snapper stocks had already occurred by Japanese fishing vessels. 1986 Quota system introduced. Based on NZ fishing catch only. The most significant catches had already occurred by Japanese fishers and was never considered when snapper quota was set with a 40% reduction of recent NZ catch history. 2013 The explosion of snapper biomass in NZ is almost unbelievable. After 27 years of snapper being avoided by fishermen around the North Island and top of the South Island. When I was a young deck hand in the early 80's on a pair trawler fishing in an area known as the Mokau gap, where snapper spawned between Nov/Dec in the North Taranaki Bight I counted 11 trawlers all within about a 4nm radius of our boat. We were all catching snapper. For about the last 15 years there has been no fishing effort in this area at this time of the year at all. I mean absolutely none. This is an area that New Plymouth, Wanganui, Auckland, Raglan and Nelson trawlers worked in the snapper schooling season. The reason no one fishes this area any more is because if you towed your trawl gear through there now your vessel would grind to a halt and when you hauled back in your gear you would have an island of snapper behind your boat you could walk on. You could easily catch 30ton of snapper in two hours. I currently catch about 40ton a year. Imagine what you would do if this happened? I think I would slit my wrist. What would the deemed value be? How would you put that fish on your boat and who would take it? If one of these fish went back in the water it is a \$400 fine. The worst thing about this is if you caught snapper like this your impact on the snapper stocks would still be insignificant. So all these crazy rules and laws have no relation to the real situation regarding snapper stocks. Its just madness, madness, madness. The situation is absurd in the extreme and every year it is getting worse. The quota system in its original form had some very good implementations, such as a by catch trade off. Deemed values set on port prices with no ramping and the aggregation rule preventing quota holders getting a monopoly on fish species. As new fish stocks get introduced into the quota system the same method that was originally used for the first fish stocks should apply. A 2-3 year moratorium should be placed on a said fish species where fishermen must land this fish to get a stock assessment on that particular species (refer to KIN8 in Q12 on not how to do it) and then set quota from there and that ACE should be made available to that fisher. In this scenario you would get total compliance by fishermen rather than what is currently occurring when new fish species get introduced into the quota system and fishermen get no entitlement. There is nothing stopping this being implemented for new species entering the ACE system and even reallocating ACE that has already been set. The problem with the ACE system is that the ACE holders hold all the cards and fishermen have to pay incredibly high prices for the right to catch fish. The ACE system is another tear of cost put on our industry and for some reason fishermen have to bear most of the cost. The people in the NZ fishing industry making all the money are ACE holders. ACE should simple not have such an artificially high value and thre needs to be some</p>	<p>difficult but the main frustration I feel is not for me but for all kiwis in our economy when I know that our fishing industry could be so much more productive. In land mass our counry is somewhere between 70th and 80th in the world, we have the fourth biggest territorial waters in the world behind Russia, Canada and USA I believe, and without doubt the most prolific fish stocks in the world, and they are simply being under-utilised. A quick question - how many trawler are now domicile in Area 8? Answer - One, I am it. I am the last one left. Much rarer than a Mauis dolphin. Ian Brown. We request a completed copy of this survey to be sent to us because we are unable to get all of the text printed because we have used up more space than each window allows. Brown and Hayman Fisheries Ltd PO Box 905,Taranaki Mail Centre, New Plymouth 4340</p>
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	way of rationalising the cost of leasing and buying ACE. I think the system used in Canada keeps their equivalent of ACE value at a sane level.	
F5	SNA1 ACE price is driven by operators who bycatch SNA and need to lease ACE rather than pay deemed value. This price can be the full wharf price as they make their profit on their other species. Quota owners then capitalise the value paid for 1 kg of ACE across the total SNA ACE. This has then overvalued the SNA quota share resulting in fishers paying 40% of gross sales in rental of access.	Increase SNA1 TACC to ease supply/demand pressure on ACE Review SNA catch by method and purpose, i.e., targeted or by-catch. Find balance in deemed value price, i.e., deterrent vs. by-catch tool. X
F6	Companies and Iwis holding fishers to ransom. This quota system is not about sustainability, Its about MONEY!! The quota system is a big cash cow for government. That's why they like deem value a money-making machine.	Give all this quota back to the fishers! Why should fishers have to pay go to work. You cannot control pelagic fish moving in and out the zone. The NZ quota system is breach as the best in the world. Have overseas scientists ever ask the fishers themselves. It's a big joke!!
F7	1, Too much of the quota is owned by people not involved in fishing. 2,TACC levels set too low 3, Deem values set too high	1, Ideally all quota should be owned only by people actively involved in the fishing industry 2, Meaningful surveys done especially on SNA8
F8	That companies that control the catch species control the target stock. That companies that control ACE large trade early enough and wait large D/V is reached and increase sale price. Fishers are very targeting to scaled D/V	Remove 10% carry over and make (a) available sustainable fish be caught on an annual basis (b) make major ACE holders trade more fairly. (although this would penalise my position as an ACE fisher) revisit D/V it is grossly unfair to by catch species that costs more than your target species catch on a daily or by voyage basis. There must be a better way to stop companies targeting without ACE = the bycatch is the issue
F9	The operation of the ACE Market generally works well. The availability of ACE in an improving fishery is frustrating, the system does not react to an increasing resource, several years of increasing abundance, over catch only means you pay more deem value, and does not often result in the fish stock TAC being adjusted, or any adjustment is so conservative it is of no use - the lost economic value is huge. They are quick to cut TAC but slow to increase - both an significant impacts on the economic benefits that flow to the NZ Economy. A major problem with the price of ACE - it is often linked closely to the Deem Value rate and bears no relation to the landed price received for the fish caught. The Deem Value System assumes a fisher can reasonably avoid catching the unwanted species - this is incorrect - at least in a multi species fishery as in East Coast South Island. When the ACE market price is essentially linked to the DV price the price of ACE becomes highly skewed. Fishers are required to land the fish and pay the Deem Value - yet the LFR / Wholesaler and Retailer only pay the base price / market price for the fish. Unless part of a Vertically Integrated Fishing Company, the fisher is usually a price taker not a price setter - the higher level players / participants all have the opportunity to make a profit from the fish that the Fisher only pays the DV Penalty on. This system is unfair and adversely affects the price of ACE to the fisher. Supply and Demand is a fair system for the pricing of ACE, but when the Deem Value system has undue influence on the fairness of the system it is wrong.	If Deem Value was somehow able to be apportioned to participants throughout the value chain it would be fairer. If TAC was more responsive to an increasing fishery the ACE market would be more efficient and correct.
F10	A number of TACC's are not set at the correct levels to reflect the current (improved for a number of years) catch levels A lot of deemed values are set too high. Differential deemed values on fishstocks that are healthy and with incorrect TACC's. The lack of ACE availability on a good number of bycatch stocks stop us from	Clearly there are certain TACC's that need to be adjusted / increased (i.e. SNA8, KIN8). The Quota management system cannot operate justifiably with fishing areas completely distorted the way they are presently operating. The reality is that there are now a lot of fish stocks that should be increased due to solid

	catching all possible ACE for certain target species hence distorting the whole picture	improvement in CPE and very efficient management procedures.
F11	Lease prices do not reflect the value of the fish but follow the unrealistic deemed value process which has nothing to do with fish pricing	SNA8 needs at least a 50percent increase in tac kin8could easily be doubled we throw back all our live kin and sna tar 8 ace is like rocking horse shit all available ace caught in 3 tows pressure is coming on area8species as we cant fish inshore anymore because the minister and his toadies have been captured by the greenies and stopped inshore set netting .we had a balanced package and now risk bankruptcy by fishing deeper waters that we struggle to get ace for and have to tender higher than economic prices to secure ace while our ace prices are less as no one can target those shallow species ie spo8
F12	TAC's far to low SNA8 and KIN8. Differential Deemed Values for SNA8 & KIN8 are far to high. These high values allow the ACE owners to dictate the market price. At present I clear 50c per kilo SNA8 after paying \$6/ kilo ACS rental.	Eliminate Differential and set a realistic Deemed Value which would reduce the exorbitant ACE rentals currently charged. This would allow us to continue landing SNA & KIN as by catch to WAR, SPO, SCH and GUR rather than shifting from lucrative target species grounds due to over-abundance of SNA and KIN.
F13	1/ not enough quota shares available 2/ astronomical deemed value \$ for particular specie that fisher is liable for. 3/ having to land certain species of small fish with no commercial value because there is no size limit.	1/ increase in quota shares where warranted , and backed by a healthy stock 2/ nobody gains financially or is penalised financially. if fish is caught and ace not found the fish is landed and processed and given to the hospices and hospitals for food at the cost to the processor to fillet only, example cost \$2.00 per kilo. 3/put a size limit on all specie, 11 inshore species do already have size limits. the main issue for me as an inshore trawlerman is gurnard, it has no size limit and if we discard it with fish that do have size limits(ie fla) we are so called dumpers and high graders and are liable for extreme fines and boat seizure, put a size on all species and stop mucking us around so we can do our jobs in these increasingly challenging financial times
F14	Not enough ACE is available on the open market as individual species. Most of the ACE is tendered as packages. This suits Processing companys much better than individual fishers. The Tendering process is also often corrupt. It is only used to establish a market value for the ACE, which is then sold to a preferential purchaser.	Not sure how to do this, without an overhaul of the ITQ system.
F15	The wrong people own it. Needs to be only harvesters who should own quota the price is too high. The Maori owned quota mostly is traded in parcels and fishers have no way of tendering for their needs as only the large company's have means of acquiring the large mixed parcels and trading there unneeded ACE amongst other companies. The choke stocks that control our ability to catch available bycatch and the price these choke stocks trade at .the tail wags the dog. When seasonal abundances occur there is too slow a mechanisim to ddress the new abundance to make it available to be fished.	Cost recovery should only be levied against caught quota . as it is now we are levied against quota that is not even available in our territorial waters. the uncaught quota in the system which is cost recovered is causing the overall price of the caught quota ace price to be higher than it should be for ace owners to recover their losses the crown buying all quota back and starting again with a new ownership model so as the super profits go back to the harvesters so as we can modernize our old decrepit fleet that was largely built by the Muldoon government in the 70s.the old men and old vessels are nearly finished and there is no way with the present structure that there is any future for especially the inshore fishery into the future. the QMS system is supposedly the best in the world for managing fishery's but 28 years on it would seem it managed the stocks but made fishermen the endangered species
F16	The people with the money have top priority so is hard for new skippers to go and buy own boats and get ACE. Large companies have the majority share which does not allow small time boat owners to lease ACE. To buy or lease ACE in some fisheries is too high risk as lease	Prevent fishing companies from buying any more quota. This would allow the fisherman more control of their own livelihoods. They are the ones that catch it and are at the mercy of large greedy companies who make a great deal of money by paying the fisherman a very small

	prices are ridiculously high due to companies who have the financial capital to pay more for it and buy many tonne.	percentage of what they get paid. The only ones who make money out of fishing are those who own quota. There are very few skippers under the age of 40 (unless their family owns quota) because they cannot make a decent living out of it. The industry will be in trouble over the next 20 years as there will be fewer and fewer skippers. I would like to see the statistics on how many people are sitting their tickets. Having conversations with fisherman about what is happening at the coalface needs to be done. Finding out what is really going on and what is happening is imperative to resolve the issues
F17	The big boys hold all the quota on most stocks which they have been leasing out now since 1986 or so. Most HAVE INCREASED THE LEASE over the past few years. people hold ace and have never been involved in the fishing industry	No company or individual should be allowed to own more than 10% of any ace you must be engaged full time in fishing and earn no less than 95% of your total income for that year from fishing. ace is to protect our fish stocks, not a trading commodity
F18	SNA8 is driving fishers from the industry as there is no ace available to lease. we are catching sna in places where we would not get them in the past so the fishery is very healthy. the price of any available ace usually exceeds the port price and the lease price is driven by an excessive deem value	The easiest management tool is one that worked well in the past. a return to bycatch trade off and an increase in sna 8 tacc would be of enormous benefit to fishers
F19	Corporate *** who see ACE as theirs to manipulate the desperate fishers who are dependent on ACE to feed their family. Large quota owners are a disgrace to the inshore fishers. It is in a state of crisis due to the fishers not being paid enough to upgrade - progress - keep up with change and maintenance on vessels.	Short of not allowing large corporates being *** ! Any oxymoron! Bottom line is if the quota owners want their ACE caught they have to get good fishermen, they want to screw fishers as quota owners want more and more for their valuable quota parcel. I see a collapse of the fishing industry will be the only way to see the fishers paid more for their labour, the fishers left are efficient, they have to be. The good quota owners and fishers will work together. Forget markets and together make it work. A shared income rather than it all being allocated to the processor. See diagram - Small = Fisher's share; Medium = Processor's share; Large = Quota owners share
F20	Significant quantities of ACE do not become available until the last 2 months of the year.	Bigger companies hold on because of uncertainty of future catch. Removing the 10% underfishing rights would free up the market if companies knew they could not carry ACE forward. It is the single biggest impediment in the ACE market as removal would free up ACE for fishers who are overcaught.
F21	Manipulation of large ace holders	
F22	Expense.	Return some of the tonnage taken off fishers eg SNA and KAH - area 1 - both stocks very plentiful - lease costs would then be lower for businesses.
F23	Avoiding catching species for which stocks have recovered, i.e., MOK2, HPB2, RIG2, SCH2	Species trade-off, i.e., WAR2 for MOK2, WAR2 for RIG2, WAR2 for SCH2 HPB2 for SCH2
F24	Main ACE holders holding monopoly with species	Unsolvable at the moment due to the way system was set up.x
F25	Getting ACE holders to release quota early enough before October.	I think you just have to keep on to them.
F26	Incorrect TACC levels	MPI needs to be more active in setting TACC levels correctly/annually. x
F27	Cost. ACE can cost more than value of fish. Availability. Controlled by big corporations (large amounts)	
F28	The cost and availability of SNA1	Increase TACC Improve fishing practices to minimise undersize and poor quality SNA Installation of VMS to help MPI catch offenders who may be dumping fish they don't have ACE for.
F29		leave it to the company!
F30	Big Company and Block holdings command the availability	Small operators should have ability to source modest amounts of Quota in their area, instead of Large Company's dictating availability. i.e. Local iwi should have some say in how Quota is apportioned instead of the Administrators of a Block Holding hunting the highest

		dollar regardless of the cost in jobs and revenue to the coastal community it is sourced from.
F31	SNA1 ace is some times more expensive than the price of the fish	Price needs to be cheaper
F32	some ace prices are far to high if the ace owners keep demanding high prices for ace more fisherman will be selling up leaving no one to catch there ace	fisherman should agree on fixed ace prices for all areas it would stop some trucking of fish
F36	Lack of available information	Make Fred more accessible
F37	Non availability of plentyful species such as SNA , SPO , ELE to name but a few.	Faster increases in quota when its obvious the fishery is in good health and can sustain an immediate increase. Even if only temporary subject to good interactive consultation with the fishers , departments etc.
F40	Revise ACE on ELE3 and GUR	Increase TAC on above species. Area 3. xps
F42	Deemed values!	Making deemed values slightly below the port value. Not over the port values which in some cases could bankrupt the fisher. xps
F43	Don't have any issues with the ACE market. xps	
F45	Unfair balance of ACE to the big fishing companies.	Put a stop on the big fishing companies being able to own any more quota
F46	Complicated legal requirements	Being less complicated so buyers can do their own dealings on line
F48	Large monopoly of ace owners.	Shares being owned by fishers and aggregation being imposed, not rules changed to assist large maori and corporates control the work place access to ace
F49	The high lease prices	Make it fair for all parties concerned. 1/3 1/3 1/3 to all parties ,then we get a chance to have excellent boats , the fisherman takes alot of the risks ,
F50	finding it... people beening to greedy	??
F51	High cost of ace	Lower cost ace put on the market
F53	Bigger operators seem to be able to secure ACE easier than small operators Some species don't seem to have enough quota/ACE allocated to cover healthy fish stocks.	Quicker adjustments on available fish abundance to increase ACE tonnages.

APPENDIX B – ISSUES AND SUGGESTIONS – SNA1

Fisher	Issues	Suggestions
FSNA1	Expense.	Return some of the tonnage taken off fishers eg SNA and KAH - area 1 - both stocks very plentiful - lease costs would then be lower for businesses.
FSNA2	The cost and availability of SNA1	Increase TACC Improve fishing practices to minimise undersize and poor quality SNA Installation of VMS to help MPI catch offenders who may be dumping fish they don't have ACE for.
FSNA3	SNA1 ACE price is driven by operators who bycatch SNA and need to lease ACE rather than pay deemed value. This price can be the full wharf price as they make their profit on their other species. Quota owners then capitalise the value paid for 1 kg of ACE across the total SNA ACE. This has then overvalued the SNA quota share resulting in fishers paying 40% of gross sales in rental of access.	Increase SNA1 TACC to ease supply/demand pressure on ACE Review SNA catch by method and purpose, i.e., targeted or by-catch. Find balance in deemed value price, i.e., deterrent vs. by-catch tool.
FSNA4	If one doesn't have Quota and has to rely on ACE buying to cover catch, it is very difficult to operate as a Fisher these days. All one ends up at the end of ones fishing life is a worn out boat, that can't afford the expenses to replace or keep up to safety standards, no matter how much a person trys. People that were given Quota in 1984 and eventually sold out for millions, should not of been able to have sold to the big Companies that now have full control over any future Quota and ACE. These people were allowed to rape the sea, go were they like to fish and fish as much as they liked.	The one thing you have not asked for in your survey is fish in different Areas which makes a big difference. Like fishers in Area 8 can't fish there if they have no SNA8, which is in abundance, and yet there is Trevally, John Dory, Rigfish etc; in plenty, so gives a false impression of the fishery.
FSNA5		Leave it to the company!
FSNA6	SNA1 ace is some times more expensive than the price of the fish	Price needs to be cheaper
FSNA8	Availability of stocks in holding.	Provide fisherman also with information directly via email etc.
FSNA9	complicated fishserve site	Education I will ring fishserve and ask the staff what to do
FSNA10	SNA1 is in high demand with LFR, Fishers and some wholesalers paying more for SNA1 ace than what the fishers are getting payed for the fish.	Increase in the amount of ace for SNA 1 and SCH 1.
FSNA11	The ACE is controlled by a few people so they charge as much as they can get without regard for the people catching. As fisherman leave the industry they are not being replaced as its to expensive for new people to enter the industry. As fisherman leave the remaining fishers are given more ace to try and keep them viable, but the problem is the cost of catching is going up and the return goes down.eg ace for SNA1 is \$5, market price of fish \$7 leaves \$2 for fisher,, 20 years ago ace \$1.50 fish price \$5 to \$6 return to fisher \$3.50 plus.	price of ace set to 10% of port price, that being an average of the prices paid for that species, e.g. tar1 average price \$5 ace price \$0.50c this is how Sanfords charge there fisherman within the company. they have lots of young fisherman coming through
FSNA14	Price expected from ACE holders vs the price fishers can receive for the fish	Not really unless ACE holders drop their prices
FSNA15	ACE is being traded as a commodity. Therefore manipulating the market. Only those actively fishing should be able to lease ACE. Prices for species such as SNA1 are at ransom levels because fishers cannot fish or target other species without SNA1 ACE.	Increase the TAC of SNA1. Ban gill netting in SNA1 area to protect the inshore reefs for the use of recreationalists. Ban trawling of Great Exhibition Bay to protect the incoming SNA1 school fish from bulk slaughter each year at the beginning of the quota year.
FSNA17	To control/ manipulate the market the big companies secure the controlling species by holding the main by catch species e.g. Sch1 and hpb1 and ski1. Causing fishers to not land them this leads to poor data and poor science thus poor management.	Lower the deemed values significantly to be able to record the changes and magnitude. These changes could provide a correction factor for previously recorded data.
FSNA18	if you will be able to get the wanted ace & the cost of it	

Processor	Issues	Suggestions
PSNA1	Price. Some organisers pay prices that are not good economically. No. of players. Businesses using ACE to catch fish pay high prices because effort made to squeeze companies out but quota holders that trade need to realise that without the smaller businesses the ACE price they would receive would plummet so they need to ensure smaller businesses don't get priced out and still get ACE.	Education of market economics to ACE holders and the ACE holders looking beyond the now for a return and look at big picture. X
PSNA4	Its a sellers market so the pricing can be horrific!	Cap the pricing but I'm not really sure that thats fair to those that own the ace.
PSNA6	Not enough sna1 available outside big companies - this really limits our business - without sourcing sna1 often at inflated prices we can't have our fishermen catching all the other fish we need. End up paying the full wholesale price for a landed snapper just to secure the ace to go out and get it caught on the basis we will make money off the "by catch " which in reality are the target species	Need an increase in sna1 ace availability - tacc increase - there is heaps of snapper there and boats have to avoid areas / move / stop fishing if they get a load of snapper without mix
PSNA7	I think the market itself is OK but that the TAC is too rigid and does not adjust fast enough for changes in the stock levels.	A more proactive attitude towards monitoring catch levels V stocks so as to make more regular adjustments. A current classic example is SNA7 which has come back so strongly in the last couple of years that fisherman are being forced out of fishing due to the lack of SNA7 ace meaning they cannot now fish.

Broker	Issues	Suggestions
BSNA1	I see huge common demand for many stocks creating competitive interest in them. Snapper stocks dictate the fishers plans for the year and the lack of their availability and high pricing means that the fishers are out there for the value of their by-catch, if they are able to go fishing at all - given the effects of the deemed value structure on their operations. Lack of availability of key stocks drives prices up. Several industry players will pay top price for lwi ace packages at the beginning of the season (as a safeguard) and if these stocks are not caught the ace is in the market place with an expectation of recovering the amounts paid. I think the TACC's do not accurately reflect the abundance of fish available and any change to them is too slow to be of use to the fisher out on the water.	Closer monitoring of the situation as the fishing year progresses and mechanisms in place to make changes in an efficient way. A major overhaul of TACC's throughout the QMS. At this stage, it could only be identified as a Quota System, the management leaves us struggling. As a broker, I am constantly expected to be a magician, to procure ace where there isn't any available. As an industry we constantly hear from MPI "increase our exports", yet the requirements of the first link in the chain - the ability to cover the landed catch legally - are not available to us for the reasons given above. I think a lot could be achieved with a QMS/Deemed Values working group involving key fishing operators (owner operators/businessmen) around a table in Wellington. This would give you some solutions to the problems faced by industry.
BSNA2	There are no real issues just not enough ACE available for the main fish stocks that are caught in area.	Not sure if there is a answers - an increase in the TACC in some cases will only help for a short while but fishers will always fish to the limit available. In the case of SNA8 - 28N rights still exist and if the TACC is increased then most of any increase will go to one operator who is still in the industry and they will still control the ACE therefor not assisting those that need it now to catch other fish stocks in the area. Maybe have a more flexible system like in season TACC like they do for some fish stocks - squid, red cod could be one answer that might work for those fish stocks which are fully caught each year.

Quota Holder	Issues	Suggestions
QHSNA2	I cannot speak outside Northland but there is an urgent need to bring some TACCs in line with long term sustainable catches. The most important ones to address are FLA1, GUR1, TRE1, and possibly JDO1 and TAR1 are worthy of discussion.	Reduce TACCs on above species. This will create long term advantages. It will allow a rebuild by leaving additional breeding stock in the water in the "good" years. It will stop desperate fishers going to sea when the SNA ACE has run out looking to catch left over ACE in species that do not exist. It will add value to those stocks. It will reduce the tonnage of ACE that has no value and is a liability. It will give some credibility back to the QMS. Recreational fishers will support the move. The Ace in the above species that is unable to be sold has NO value. This move will restore value to the reduced ACE. Fishers will be able to catch it and ACE sellers will be able to sell it. The MPI will build goodwill because currently it looks as though TACCs in these species have been set just for revenue gathering. That is, levies are being collected on quota that 23 years of the QMS illustrates doesn't exist.
QHSNA3	The volume of free ACE in the market is very low, as most ACE is controlled by the handful of fish companies and IWI. Access to ACE from Fish Companies and IWI always comes with strings attached so it is not an open market.	Changes the law to make it compulsory that annually 10% of all ACE has to go into a Government controlled ballot where it can be tendered for in the order of access. So private Fishers and possible new entrants to the industry get to bid in the first round, then Large Fish Companies, IWI and the amateur sector get to bid on the remaining ACE stocks. This will help stabilise existing fishers plus open up the industry to new entrants.
QHSNA4	The large number of stocks for which there are no commercial fisheries and, consequently, no ACE markets	Don't introduce stocks to the QMS unless and until they form a commercial fishery
QHSNA5	TACC inertia. TACC's not reflecting the stock available. FLA1 might as well not be in the QMS as TACC has not come near to constraining catch (to my knowledge) anytime this century. I average 50% of my FLA1 ACE unsold. The imbalance between fish and ACE available for SNA1 is compromising the ability to target other species such as JDO1 and TRE1..	Manage for complexes of stocks. More nimble response to TACC setting, especially for species like FLA1 which are short lived and vary greatly in stock size year to year.
QHSNA7	I lease out ACE and have no issues in finding buyers	
QHSNA9	Too few inshore fishermen and small owner operators qualified to fish between the 50 and 100 k limit M	Make it easier for inshore fishermen to gain their qualifications and to buy ACE
QHSNA11	Owner of SNA1 ACE only. No problem of selling the lease for it	N?A

Not Specified	Issues	Suggestions
NSSNA1	Excessively high lease prices for most stocks	Lower deemed values those stocks and remove the ratcheting up of deemed values penalties
NSSNA2	TACC SNA1 too low	Increase TACC SNA1

APPENDIX C – THE COMPARISON OF DEEMED VALUE AND ACE PRICE

Comparison of Deemed Value Rates to ACE Price for Arbitrage Fishstocks 2005-06

Fishstock	DV Savings	Catch vs ACE %	DV Rate Low	DV Rate High	ACE Price (\$/Kg)		Port Price (\$/Kg)
					Average	High	
LIN7	189,464.10	110.60%	2.21	4.42	1.47	3.00	2.23
HOK1	185,387.76	103.99%	0.59	1.18	0.52	0.70	0.61
BAR5	122,656.71	125.89%	0.19	0.38	0.14	0.15	0.29
SNA8	86,538.19	110.30%	4.25	8.50	2.67	4.00	3.92
TAR8	45,085.19	115.04%	1.43	2.86	0.75	1.00	2.42
WAR3	28,566.83	129.36%	0.25	0.50	0.22	0.35	0.92
STA5	27,436.45	98.75%	1.01	2.02	0.40	1.01	1.24
GUR3	24,269.03	114.60%	0.85	1.70	0.34	0.70	1.27
STA7	14,348.04	97.30%	1.45	2.90	0.80	1.00	1.07
HPB3	12,364.55	117.33%	1.50	3.00	0.89	1.52	2.22
BYX2	5,774.61	101.86%	1.66	3.32	0.92	1.40	1.78
SNA2	4,375.32	122.42%	3.00	6.00	2.56	3.50	3.73
EMA7	3,548.95	112.67%	0.26	0.52	0.14	0.20	0.36
OEO4	3,136.69	97.54%	0.78	1.56	0.36	0.55	0.80
KIN8	2,007.09	112.08%	8.90	17.80	5.44	9.00	3.87
TAR2	1,137.60	100.07%	1.58	3.16	1.12	1.80	2.26
GUR8	1,065.82	62.77%	1.13	2.26	0.56	1.00	1.40
KIN2	423.91	109.45%	4.92	9.84	1.51	2.50	3.32
KIN7	212.53	99.29%	8.90	17.80	2.08	8.00	1.40
BNS2	87.72	105.41%	2.18	4.36	1.44	2.50	2.58
BCO3	78.74	109.70%	1.92	3.84	0.89	2.00	3.12
SKI1	64.10	109.35%	2.64	5.28	1.34	3.01	2.42
TAR7	30.88	97.17%	0.83	1.66	0.51	0.85	1.53
KAH3	14.79	56.80%	0.61	1.22	0.10	0.53	0.43
LIN1	9.80	82.71%	1.69	3.38	0.74	1.52	1.47
FLA1	1.49	76.78%	1.50	3.00	0.37	1.50	3.35
SQU1T	0.88	91.49%	0.88	1.76	0.19	0.50	0.77
DV Savings	758,087.77						

Comparison of Deemed Value Rates to ACE Price for Arbitrage Fishstocks 2006-07

Fishstock	DV Savings	Catch vs ACE %	DV Rate Low	DV Rate High	ACE Price (\$/Kg)		Port Price (\$/Kg)
					Average	High	
BAR7	177,615.73	126.51%	0.19	0.38	0.11	0.18	0.19
STA5	60,872.57	100.87%	1.01	2.02	0.42	1.00	0.92
RCO7	24,999.33	102.70%	0.49	0.98	0.14	0.50	0.52
LIN7	18,877.11	98.91%	2.21	4.42	1.72	3.00	1.36
STA7	18,853.65	100.15%	1.45	2.90	0.69	1.00	0.95
OEO4	15,272.83	100.04%	0.78	1.56	0.50	0.80	0.80
GUR3	13,859.95	123.57%	0.85	1.70	0.50	1.13	1.09
BYX2	10,113.52	104.30%	1.66	3.32	0.87	1.40	1.78
KIN7	6,321.42	177.75%	8.90	17.80	3.93	5.72	1.88
TAR7	5,443.59	99.91%	0.83	1.66	0.48	0.95	1.53
HPB3	3,513.61	115.77%	1.50	3.00	1.02	2.00	4.56
SKI2	2,992.66	123.44%	1.50	3.00	0.61	1.50	3.14
WAR3	2,246.99	124.03%	0.25	0.50	0.19	0.30	0.92
KIN8	1,870.42	103.93%	8.90	17.80	4.87	8.00	4.31
TAR8	1,575.67	112.42%	1.43	2.86	0.87	1.30	2.42
ORH2A	1,357.44	99.94%	4.00	8.00	2.04	2.75	3.04
SNA7	1,179.03	112.81%	2.01	4.02	1.05	1.50	4.67
SPO7	1,154.94	118.85%	2.80	5.60	1.00	1.93	3.19
SNA8	782.17	102.09%	4.25	8.50	2.71	5.63	4.67
SNA2	686.88	104.50%	3.00	6.00	2.30	4.20	4.67
ORH7B	253.44	102.68%	3.20	6.40	0.67	1.50	3.35
BCO3	191.68	108.61%	1.92	3.84	1.38	2.30	2.94
DV Savings	370,034.63						

Comparison of Deemed Value Rates to ACE Price for Arbitrage Fishstocks 2007-08

Fishstock	DV Savings	Catch vs ACE %	DV Rate Low	DV Rate High	ACE Price (\$/Kg)		Port Price (\$/Kg)
					Average	High	
SPO2	36,019.32	116.85%	2.70	11.00	1.74	3.00	2.82
KIN8	25,609.57	121.23%	8.90	17.80	4.67	9.00	5.33
STA7	16,304.79	99.18%	1.45	2.90	0.74	1.14	1.09
LIN7	12,680.58	99.80%	2.38	6.00	1.77	2.80	3.07
LIN5	6,550.60	110.04%	2.38	6.00	1.33	2.80	3.07
BCO4	4,484.39	97.43%	1.34	2.68	0.32	0.80	3.76
ORH2B	2,423.15	113.14%	3.86	7.72	2.02	2.60	2.99
TAR4	715.01	101.53%	0.84	1.68	0.41	0.65	1.84
SKI1	590.03	101.12%	2.64	5.28	1.42	3.00	1.54
PAU5B	540.00	99.56%	60.00	120.00	26.37	34.00	44.39
KIN2	389.38	58.67%	4.92	9.84	1.58	2.81	5.33
SPO7	80.60	102.54%	2.80	5.60	1.30	1.93	2.82
ORH7B	1.09	594.80%	3.20	5.00	0.81	1.40	2.99
DV Savings	106,388.51						

Comparison of Deemed Value Rates to ACE Price for Arbitrage Fishstocks 2008-09

Fishstock	DV Savings	Catch vs ACE %	DV Rate Low	DV Rate High	ACE Price (\$/Kg)		Port Price (\$/Kg)
					Average	High	
HPB3	3,986.82	112.75%	2.30	4.60	1.24	2.30	3.07
LIN7	2,374.05	97.12%	2.38	6.00	1.78	2.85	3.07
SPO2	1,505.74	121.73%	2.70	5.40	1.59	2.70	3.63
SCH7	940.43	98.67%	1.73	3.46	0.92	1.66	2.19
SNA7	117.90	96.29%	8.00	16.00	2.53	6.00	4.98
SCH8	63.00	102.32%	1.75	3.50	1.08	1.70	2.19
KAH2	55.29	105.15%	0.61	1.22	0.20	0.50	0.23
BYX2	6.64	98.08%	1.66	3.32	0.99	1.20	1.78
DV Savings	9,049.87						

Comparison of Deemed Value Rates to ACE Price for Arbitrage Fishstocks 2009-10

Fishstock	DV Savings	Catch vs ACE %	DV Rate Low	DV Rate High	ACE Price (\$/Kg)		Port Price (\$/Kg)
					Average	High	
SPO2	5,856.84	131.24%	2.70	5.40	1.71	2.50	3.63
GUR3	5,224.94	111.71%	1.50	3.00	0.84	1.60	1.71
SNA1	318.24	98.27%	13.00	26.00	4.06	7.40	5.14
BCO2	34.71	60.02%	1.79	3.58	1.01	1.67	3.76
SSK1	8.82	96.01%	0.30	0.60	0.20	0.30	0.36
RSK7	0.16	109.00%	0.30	0.60	0.17	0.25	0.42
DV Savings	11,443.71						

Comparison of Deemed Value Rates to ACE Price for Arbitrage Fishstocks 2010-11

Fishstock	DV Savings	Catch vs ACE %	DV Rate Low	DV Rate High	ACE Price (\$/Kg)		Port Price (\$/Kg)
					Average	High	
BAR5	57,530.09	102.54%	0.25	1.00	0.14	0.18	0.38
ELE3	18,492.59	109.76%	1.41	2.82	0.86	1.45	2.19
BCO3	12,360.94	106.79%	3.75	7.50	1.25	3.00	4.50
LIN7	5,567.45	109.21%	2.38	6.00	1.72	2.51	2.48
LIN1	3,421.80	101.76%	2.38	6.00	0.92	1.51	2.70
SPO2	1,903.39	119.64%	2.70	5.40	1.56	3.00	3.38
MOK1	812.69	98.13%	0.88	1.76	0.76	1.00	2.01
SK11	201.42	106.55%	1.50	3.00	1.27	2.00	1.79
GMU1	17.47	82.02%	1.21	2.42	0.52	1.00	3.42
KAH1	1.00	86.91%	0.66	1.32	0.32	0.55	0.76
BYX2	0.40	106.92%	1.66	3.32	1.05	1.50	1.79
DV Savings	100,309.24						

Comparison of Deemed Value Rates to ACE Price for Arbitrage Fishstocks 2011-12

Fishstock	DV Savings	Catch vs ACE %	DV Rate Low	DV Rate High	ACE Price (\$/Kg)		Port Price (\$/Kg)
					Average	High	
LIN7	356,907.22	111.49%	2.38	6.00	1.81	2.55	2.46
SNA2	27,438.00	104.40%	5.60	16.60	3.75	5.86	6.17
RCO3	13,067.40	108.68%	0.50	1.00	0.12	0.50	0.73
GSH4	7,129.30	120.14%	0.40	0.80	0.11	0.30	0.25
ORH2A	5,245.60	100.16%	5.00	10.00	2.25	2.85	2.76
SPO2	1,784.60	109.14%	3.00	6.00	1.58	2.77	3.38
LIN5	1,027.62	98.18%	2.38	6.00	1.19	1.80	2.35
ELE3	980.10	105.72%	1.65	3.30	0.77	1.79	2.54
ELE5	188.50	112.28%	1.65	3.30	0.71	0.80	2.31
MOK1	147.14	102.90%	0.88	1.76	0.73	1.00	1.91
GMU1	31.46	86.24%	1.21	2.42	0.45	1.00	3.63
RCO2	0.60	103.33%	0.28	0.56	0.12	0.25	0.77
DV Savings	413,947.54						

APPENDIX D – DEEMED VALUE INVOICED VERSUS DEEMED VALUE SAVINGS FOR ARBITRAGE FISHSTOCKS

Arbitrage Fishstock (FS)	Deemed Value Invoiced (DV)								Total DV per FS	DV Savings per FS
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12			
BAR5	490,974.74	46,165.44	446,870.13	27,292.38		74,688.50	1,340.18	1,087,331.35	180,186.80	
BAR7	3,236.86	727,495.39	1,692.90	59.36	2.11	2,325.31	535.39	735,347.33	177,615.73	
BCO2	290.34	316.47	6.80	159.67	237.64	32.94	6.09	1,049.94	34.71	
BCO3	53,146.98	49,778.69	64,474.41	1,464.00	34,075.05	98,610.08	23,097.38	324,646.58	12,631.36	
BCO4	7,517.40	14,397.64	68,230.03	39,571.45	993.75	21,481.13	6,431.25	158,622.64	4,484.39	
BNS2	196,538.95	1,600.56	152.70	14,850.00	98.70	420.15		213,661.05	87.72	
BYX2	61,296.56	118,568.49	1,349.18	3,499.94	63,485.57	227,958.11	57,457.96	533,615.81	15,895.17	
ELE3	120,574.74	46,854.30	178,242.33	184,105.11	132,928.24	164,368.28	136,131.80	963,204.80	19,472.69	
ELE5	24,436.17	36,491.40	81,270.09	86,595.30	61,283.34	19,203.35	48,586.30	357,865.95	188.50	
EMA7	116,329.36	7,710.14	2,674.83	196.40	108.42	4.52		127,023.68	3,548.95	
FLA1	1,485.06	3,531.84	2,029.62	2,177.82	2,288.10	6,457.68	5,326.92	23,297.04	1.49	
GMU1	2,067.41	22,039.52	8,456.01	821.11	4,612.04	7,761.81	14,156.47	59,914.36	48.93	
GSH4	2,630.24	4,603.94	60,112.34		41.96	342.04		97,995.14	7,129.30	
GUR3	142,676.65	217,519.01	106,550.02	214,622.40	212,759.72	69,966.66	17,275.74	981,370.19	43,353.92	
GUR8	891.34	2,779.57	156.17	7.23	331.32	196.85	605.68	4,968.15	1,065.82	
HOK1	2,714,835.30	347,099.12	1,115.62	645.96	4,716.48	39,256.76	2,594.25	3,110,263.49	185,387.76	
HPB3	138,631.08	166,146.24	44,876.59	131,915.86	63,522.14	9,289.84	486.50	554,868.24	19,864.98	
KAH1	1,291.09	7,600.30	12,520.97	1,625.05	4,821.78	2,559.27	1,461.98	31,880.43	1.00	
KAH2	4,893.79	3,251.67	1,148.87	42,691.68	259.25	1,404.05	141.64	53,790.95	55.29	
KAH3	415.17	541.51	677.71	92.77	440.05	234.24	336.96	2,738.41	14.79	
KIN2	41,327.02		3,240.51	670.10	1,303.21	5,953.00	134.81	52,628.65	813.29	
KIN7	10,438.99	71,292.20		113.92		742.26	110,228.28	192,815.65	6,533.95	
KIN8	53,642.44	30,809.31	79,546.78	35,639.16	66,350.92	19,347.53	393,395.49	678,731.62	29,487.08	
LIN1	1,316.92	174.07	101.78	30.94	715.10	48,219.67	7,936.01	58,494.49	3,431.60	
LIN5	356.14	41,680.54	2,761,529.69	5,629.23	25.44	409.17	160,925.24	2,970,555.44	7,578.22	
LIN7	768,081.17	195,885.03	103,080.02	19,941.73	215.06	1,030,196.67	1,051,748.40	3,169,148.08	585,870.51	
MOK1	9,835.97	6,954.92	5,917.47	6,489.54	2,059.68	8,479.71	16,062.41	55,799.71	959.83	
OE04	28,574.52	23,879.23	8,542.87			14,528.59	16,341.00	91,866.22	18,409.52	
ORH2A		60,456.00			977.00	34,970.00	70,280.00	166,683.00	6,603.04	
ORH2B		32,385.40	98,603.08		103,178.80		460.00	234,627.28	2,423.15	
ORH7B		12,714.24	24,565.18	2,147.26				39,426.68	254.53	
PAU5B	28,200.00	20,460.00	12,480.00		15,972.00	1,320.00	594.00	79,026.00	540.00	
RCO2	516.41	1,770.85	22.42	56.46	508.75	957.41	13,094.92	16,927.22	0.60	
RCO3	1,426.52	9,707.46	494.60	422.92	18.04	330.92	280,520.94	292,921.40	13,067.40	
RCO7	373.81	96,292.53	654.21	124.75	179.54	164.25	102.12	97,891.20	24,999.33	
RSK7	336.16	2,094.84	4,828.12	13,882.00	9,184.67	2,205.17	568.78	33,099.74	0.16	
SCH7	3,806.55	3,169.01	5,014.92	8,211.27	10,052.20	32,633.61	398.59	63,286.17	940.43	
SCH8	1,164.45	14,371.49	834.40	51,471.84	420.42	27,229.30	242.55	95,734.45	63.00	
SKI1	64,637.13	31,081.67	44,897.11	2,107.26	49,246.38	30,693.42	38,980.68	261,643.64	855.55	
SKI2	8,794.92	113,697.00	25,599.51	46.50	1.50	194,734.20		342,873.63	2,992.66	
SNA1	326,825.20	10,758.80	27,459.64	227,154.20	422,912.88	2,152,350.20	82,411.68	3,249,872.60	318.24	
SNA2	238,268.40	71,781.48	35,442.50	20,750.00	474.50	41,155.00	92,007.90	499,879.78	32,500.20	
SNA7	289.84	80,210.66	1,460.40	8,180.50	1,301.20	5,738.60	109,808.20	206,989.40	1,296.93	
SNA8	617,355.68	218,181.57	30,744.20	353,543.70	28,859.00	735,409.50	95,998.40	2,080,092.05	87,320.36	
SPO2	59,361.75	36,240.75	88,092.41	77,870.92	100,081.01	66,161.34	51,545.78	479,353.95	47,069.89	
SPO7	1,765.34	191,633.23	28,559.10	36,498.90	38,180.40	32,669.64	22,414.08	351,720.70	1,235.54	
SQU1T	1,234.15	1,562,068.18	122.32	151.25	165.76	512.16	111.65	1,564,365.48	0.88	
SSK1	16,095.64	10,455.72	5,048.12	761.20	2,002.01	691.92	1,882.14	36,936.75	8.82	
STA5	86,263.66	110,330.95	18,693.28	595.09	10,389.99	720.94	6,471.19	233,465.10	88,309.02	
STA7	55,187.29	46,548.54	30,178.68	317.55	136,601.19	11,539.80	8,979.97	289,353.01	49,506.48	
TAR2	142,206.95	11,270.46	584.60	155.60	131,464.90	398,933.75	187.15	684,803.41	1,137.60	
TAR4	387.58	115.08	7,494.82	4.54	1.18	1.68		8,004.86	715.01	
TAR7	2,998.52	31,477.48	197.85	102.50	17,458.65	341.25	509.05	53,085.31	5,474.47	
TAR8	59,007.01	52,466.41	194.60	587.15	972.70	264.65	167.10	113,659.62	46,660.86	
WAR3	415,960.55	372,019.32	270.19	47.70	1,611.04	2.70	876.06	790,787.56	30,813.82	
DV Invoiced Arbitrage FS	7,130,195.87	5,398,925.66	4,537,102.69	1,626,099.16	1,739,890.75	5,646,169.58	2,981,621.65	29,060,005.37		
DV Savings	758,087.77	370,034.63	106,388.51	9,049.87	11,443.71	100,309.24	413,947.54		1,769,261.27	
Percentage of DV Savings to DV Invoiced	10.63%	6.85%	2.34%	0.56%	0.66%	1.78%	13.88%		6.09%	