Compiled Record of Discussions and Analysis

of the Joint Working Group on Deemed Values

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2.0 Introduction

2.1 Background

The Joint Crown and Industry Working Group on Under and Over Recovery examined the issue of whether deemed value revenue was a mandatory consideration of the Minister in setting a future cost recovery levy order. That Working Group recommended to the Minister of Fisheries[1] that a Minister-mandated review (similar to the 1999 cost recovery review) of the entitlement of rights holders to a proportion of revenues collected from deemed values be commenced in the second half of the 2003 calendar year. In accordance with this recommendation a Joint Working Group (JWG) was created to undertake the review.

In developing terms of reference for the JWG on deemed values it became apparent to both the Ministry of Fisheries (MFish) and seafood industry representatives that it would be more productive to broaden the scope of the review to include deemed value policies beyond distribution of deemed value revenues. Consequently the scope of the review was broadened to include policies for setting and adjusting deemed values and the information basis for those policies. The terms of reference for the group envisioned that a range of other matters that are closely related to the balancing regime that would inevitably be discussed in the review. These include the setting of total allowable catches (TACs) and total allowable commercial catches (TACCs) and the reporting, record-keeping and compliance regime.

2.2 Maximizing Value from New Zealand Fisheries

The purpose of the Fisheries Act 1996 is to provide for the utilisation of fisheries resources while ensuring sustainability. Utilisation means conserving, managing, using, enhancing and developing fisheries resources to enable people to provide for their social, economic and cultural wellbeing. Ensuring sustainability means *(a)* maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations and *(b)* avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment.

MFish has formulated a strategic goal for the New Zealand's fisheries resources consistent with the purpose of the Fisheries Act: "[To] maximise the value New Zealanders obtain through the sustainable use of fisheries resources and protection of the aquatic environment". The Ministry is developing a new management approach to meet its obligations under the law and to achieve its strategic goal. This approach to fisheries management aims, within sustainability constraints approved by Government, to enable fishers to obtain the best value from the fishery. Sustainability constraints are to be expressed through standards (other standards will encompass other objectives). Management of fisheries will be delivered increasingly through collaborative approaches involving the Ministry and stakeholders.

The quota management system (QMS) provides the institutional structure for managing commercial fisheries in New Zealand to maximize the value generated by the fish stocks while ensuring sustainable use. The QMS provides incentives for commercial stakeholders to generate the maximum economic value from the Total Allowable Commercial Catch (TACC).

However, the extent to which the value of the fisheries is maximized also depends on the extent to which the management approach provides for optimal catch strategies. TACCs provide a regulatory setting that ensures sustainability. The Ministry's strategic direction encourages stakeholders to participate more actively in management of their fisheries to maximise value within sustainability

[1] Report to the Minister of Fisheries from the Joint Crown and Industry Working Group on issues associated with the under and over recovery of cost recovery levies for the period 1994/95 to 2000/01, 11 February 2003

constraints. Ideally, institutions (e.g., fisheries plans) should be established to enable rights holders to set and adjust harvests to conform to optimal total catch levels. Maximizing benefits from commercial fisheries also requires that markets for quota and Annual Catch Entitlement (ACE) are efficient.

The deemed value system is a key component of the QMS. Deemed values are civil penalties paid to the Crown for landing catch of QMS stocks for which the permit holder owns insufficient ACE. They are returned to the permit holder if he or she subsequently acquires ACE and balances catches with ACE within 15 days after the end of the fishing year. When setting deemed values the Minister of Fisheries must take into account the need to provide an incentive for every commercial fisher to have or acquire sufficient ACE to cover catch.

Deemed values play primary roles – intended and unintended – in ensuring sustainability, protecting property rights associated with ITQs, reducing transactions costs, increasing flexibility in complying with TACCs and controlling abuses of market power.

Correctly operated, the deemed value system should increase the value generated by New Zealand fisheries by reducing transactions costs. The ability to pay deemed values in lieu of ACE eliminates the need for permit holders to own an ACE portfolio sufficient to cover all eventualities prior to fishing. This flexibility reduces capital costs for fishers and reduces the probability that TACCs will be underutilized simply due to those who require ACE being unable to obtain it via the market. The ability to pay deemed values when catches are landed and balance the catch retrospectively reduces transactions costs by allowing fishers to consolidate transactions rather than acquire catch rights before or immediately after landing fish.

Because fishers can legally catch and land most QMS stocks without first acquiring ACE[2], deemed values are a critical constraint to keep catches within the TACC. Deemed values will only constrain catches within the TACC (or below open access levels) if they remove all economic incentives for catching the stock in question. Consequently the deemed value regime can, intentionally or unintentionally, allow flexibility in balancing catch at the aggregate level.

As fish stocks fluctuate, "optimal" catches may as well. An inability to adjust catch limits within TACCs, or to adjust the TACC, may reduce the value generated by the fish stocks. This is particularly true for multispecies fisheries where "optimal" catch levels of different stocks are interdependent. If flexibility or responsiveness of the decisions on harvest levels are constrained by lack of timely information or by process issues, adding flexibility to the catch balancing regime at the aggregate level through the deemed value system may increase the overall value generated by a complex of species. This will be true as long as the net value of an additional unit of catch is higher than its *in-situ* value (the value of leaving that fish in the sea).[3] Deemed values set higher than the *in-situ* value of fish may not take away incentives to catch fish in excess of the TACC but will still provide incentives to limit catches to economically optimal levels.

Although allowing catches to exceed the TACC and to be balanced with deemed values in lieu of ACE may in some cases be welfare increasing, it also currently results in the transfer of rents from ITQ owners to the Crown and to fishers who utilize deemed values to balance catches (see graphical analysis Newell 2004, pg 52).

2.3 The Interrelationship of TACCs, Deemed Values and other Management Measures

Deemed values act as a de-facto substitute for ACE. If deemed values are lower than the market price for ACE that would prevail if catch were constrained to the TACC, they provide a means for fishers to

[2] For some QMS stocks, fishers are required have minimum ownership of ACE (e.g., rock lobster, oysters, paua, freshwater eels)

[3] The value of leaving fish in the sea includes its contribution to future benefits derived from the commercial fishery, but may also include value to other stakeholders.

expand catches beyond the TACC[4]. A decision to set, adjust, or not adjust a deemed value can, in some circumstances, be functionally equivalent to a decision to adjust the TACC. Thus deemed values and TACCs are inextricably linked and it is not possible to design and evaluate deemed value policies independent of TAC/TACC setting policies. Both the economic efficiency and distributional effects of deemed value policies depend on policies for setting and adjusting TACCs.

Deemed values should be viewed as a means to allow flexibility in catch balancing at the individual level and temporary flexibility at aggregate level. The purpose of allowing temporary flexibility in balancing catches at the aggregate level could be to provide time for adjustment of management policies including TACCs. Ideally, fishery institutions (e.g., fisheries plans) should provide for flexibility in setting optimal harvest levels within the TACC.

Significant levels of catch in excess of TACCs should not be allowed to persist. If catch exceeds the TACC and is balanced with deemed values, it may be appropriate to raise deemed values to provide stronger disincentives to discourage non-balancing of catch with ACE.

However, in some cases, it may be welfare enhancing, and provided it can be achieved while ensuring sustainability, to raise the TACC of the overcaught stock. If overcatch is primarily the result of incidental catch when targeting other stocks, it may be appropriate to lower TACCs of those target stocks, but it may also be that the cost of doing so would be greater than the benefits of reducing incidental catch. Furthermore, since this would effectively sanction all ACE owners of that stock rather than those responsible for the incidental catch, it may be preferable to look for other ways to reduce incidental catch either through regulations (e.g. time-area closures or gear restrictions), quota and ACE owner agreements, voluntary codes of practice, or economic incentives including higher deemed values.

Multispecies fisheries pose the most significant problems for the deemed value system as they do for the QMS in general. Even for single species fisheries, setting TACCs at levels that maximize benefits to society is difficult and requires a great deal of information that is expensive to acquire. Setting TACCs for multispecies fisheries is considerably more difficult because generating maximum benefits for a group of species is likely to require tradeoffs between species. Information requirements for setting TACCs optimally are much greater, not least because it is necessary to understand the technical-economic relationships among species[5]. The likelihood and degree that TACCs in multispecies are out of balance can be expected to increase as new species are introduced into the QMS. Many of these are likely to be low value species for which there may be little information to determine appropriate TACCs.

Section 14A,B of the Fisheries Act 1996, provides some flexibility in setting TACCs for multispecies fisheries. It allows some fish stocks to be purposely fished down below the level that supports MSY. However, the criteria enabling the use of section 14B, as set out in section 14A, are extremely strict[6], and this may be why it has not been used. It may be beneficial to relax the requirements for applying 14B, particularly the need for approval of quota owners representing 95% of the stock. A balance must be achieved to protect minority interests, but 95% approval is likely to be prohibitively high. Section 14A of the Act already contains other stipulations designed to protect minority interests including a requirement to (a) Specify the concerns (if any) of the quota owners who do not support the proposal; and (b) Specify what arrangements are in place to address those concerns.

[4] The total available ACE and the TACC may differ in some cases since quota owners for most stocks can carry forward up to 10% of unused ACE from the prior year. To simplify the discussion we assume that total ACE equals the TACC.
[5] The degree to which the cost of harvesting one species is affected by catches, either intended or unintended, of another species.
[6] Pgs 34-38 Newell 2004

2.4 Principles for Operation of the Deemed Value System

Deemed value is a de-facto substitute for ACE. In order to provide individual incentives to cover catch with ACE, deemed value should be set above the marginal value of ACE. The margin between deemed value and the price of ACE should be sufficient to more than offset transactions costs of acquiring ACE. The marginal value of ACE is be determined by the intersection of demand for ACE and the vertical supply curve determined by the sum of total ACE (which on average equals the TACC). In cases where quota owners have agreed to shelve ACE, it may be appropriate to consider the supply as the TACC minus shelved ACE.

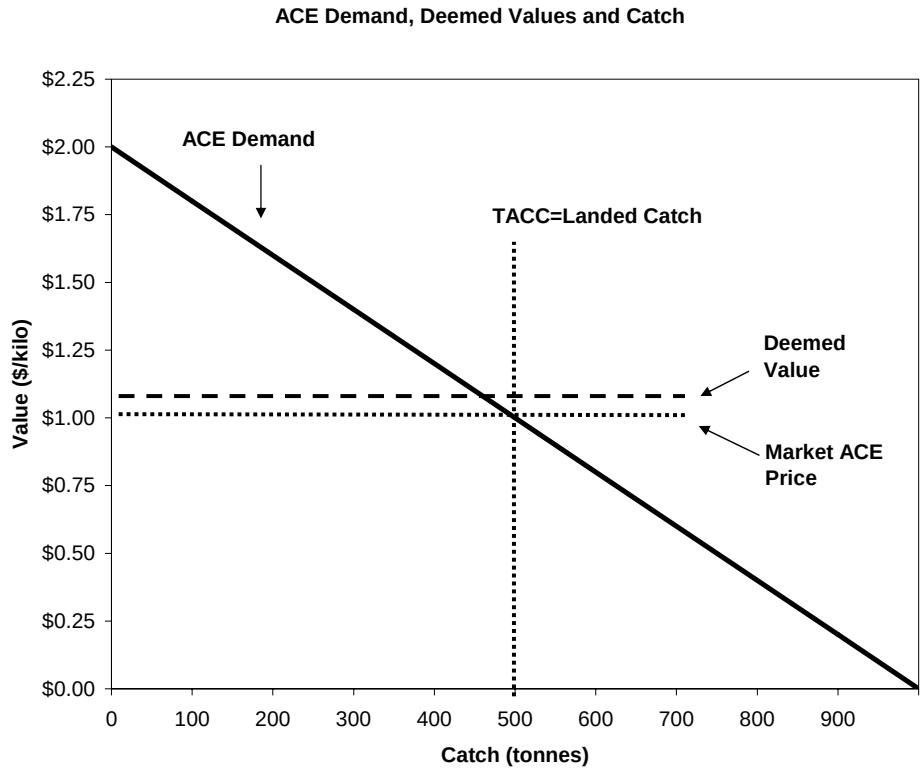

Figure 1: With deemed value set slightly above the Market ACE price that prevails where demand equals supply at the TACC, catch is equal to the TACC, all ACE is used and no deemed values are paid

Setting deemed values slightly above the marginal value of ACE should ensure that catch remains roughly equal to the TACC (unless the demand curve intersects the X axis to the left of the TACC in which case catch will be less than the TACC – i.e., there is insufficient demand). A significant level of catches in excess of the TACC (enabled by balancing with deemed values) implies that deemed values have been set below the clearing price for ACE demand at the TACC.
One of several actions should be taken in that case:

- Increase the deemed value
- Increase the TACC of the overcaught stock
- Decrease TACCs of stocks responsible for significant incidental catch of the overcaught stock
- Put in place other management measures to reduce incidental catch.

When incidental catches can be returned to the sea with very low mortality rates, it may be desirable to allow discarding catch that does not require balancing with ACE. It is not clear that there are any

circumstances where discarding of dead fish without balancing would be desirable. Such cases bring into question the rationale for including the species in the QMS and may undermine the QMS system. Therefore, great care should be taken before utilizing this remedy.

The management action chosen in response to overcatch of a TACC should attempt to maximise the value generated by the fisheries concerned while ensuring viability of all stocks. However, it should be recognized that this might result in transfers of wealth between parties even when overall benefits are increased. For example increasing the TACC of a stock A in order to relax the constraint it applies on catches of stock B may, in the long run, result in a transfer of wealth from ITQ owners of stock A to those of stock B. In general it will be preferable if the parties involved can reach an agreement, which may include compensation in some form. If management actions with allocation impacts are imposed without regard for distributional effects or without compensation, this may create incentives for rent seeking that can waste resources and lead to solutions based on the relative influence of the respective parties rather than efficiency.

Operation and outcomes of the deemed value system must be integrated more closely with processes for setting TACCs and other management measures. Compliance activity should be responsive to threats to compliance created if deemed values are greater than landed price and fishers should be made aware of this to reduce the likelihood of illegal discarding.

The operation of the deemed value system probably needs to operate differently depending on whether a stock strategy or a fisheries plan is being used to manage a fishery. For stocks managed primarily by the Ministry of Fisheries, the Minister sets a TACC that meets the sustainability and utilisation purpose of the Act and then sets deemed values supportive of that TACC. Under a *Fisheries Plan*, quota owners collectively within the TACC can determine utilisation objectives. The Crown should set deemed values consistent with the aggregate catch intended in the fishery plan provided bycatch quota owners are not restricting supply to extract monopoly rents from target quota species and undermining the utilization objectives of the Fisheries Act.

3.0 Specific Issues with Operation of the Deemed Value Regime

3.1 Is it desirable to create decision rules for how deemed values are set originally and adjusted in response to events?

The JWG agreed that it is not desirable to have prescriptive policies that dictate how deemed values are set initially or adjusted in response to specific events (e.g., TACCs being exceeded or port prices changing should not automatically trigger a specific percentage change in the deemed value). It is advisable to have clear policies and guidelines that require action in response to specific events such as overcatch of a TACC, but the policies should not dictate the response too tightly.

The policies might specify the types of actions that should be considered and the outcomes that actions should be trying to achieve. The outcomes and potentially the range of actions that might be taken may differ based on stock characteristics (e.g., shared on not shared, bycatch or target, sustainability risks exist or don't, whether there is a fishery plan in place). Policies should describe the "degrees of freedom" the Ministry has in dealing with events such as overcatch of a TACC, and the role of industry and government in mitigating that overcatch.

To flesh out policies and how they might differ depending on the fishery characteristics, the JWG has included in Appendix B case studies that explore the operation and the consequences of the proposed deemed value policies for different stock characteristics (e.g., shared on not shared, bycatch or target, sustainability risks exist or don't, stock strategy or fisheries plan).

3.2 Should stakeholders have a more direct role in setting deemed values?

Primary responsibility for both catch limits and supporting deemed values should rest with the same party, though the Minister (and Ministry) should maintain an oversight role even in cases where management is delivered primarily through a fisheries plan.

Where a fishery plan is in place, the stakeholders would presumably have primary responsibility for designing catch balancing policies, which may or may not include deemed values.

In the absence of a fishery plan, primary responsibility for both TACC setting and deemed values rests with the Minister (and the Ministry). It may be advisable for the government to seek advice from stakeholders about appropriate deemed values when formulating it's advice to the Minister, but that input would not necessarily be a formal part of the process except at the consultation stage (as it is now).

For shared fisheries, even when a fishery plan is in place (provided that plan does not include agreements with other stakeholders), it is likely that the Ministry/Minister would maintain a more active or primary role in determining deemed values.

3.3 What information do we need to set deemed values?

ACE prices, port prices, export prices, and cost recovery levies are all important informational inputs into the decision making process. Bycatch rates relative to target catches may also be relevant to determine the shadow value of the bycatch as a constraint on the target fishery. The most important information for determining the need for and amount of adjustment of deemed values is the degree to which deemed values were used to as a substitute for ACE in the prior year (i.e., catch exceeding the TACC). It is not clear that it is necessary to institute a formal procedure to determine ACE prices (such as an ACE price survey carried out by the Ministry or its agent). Doing so is likely to be costly and may result in strategic behavior that biases results. However, the Ministry may want to analyze disaggregated ACE trading data beyond simply relying on average or the range of ACE prices reported in the bluebook and might seek information from other sources to ground truth the ACE prices.

3.4 Should deemed values differ during the year (interim deemed values) or across individuals (differential deemed values) and when should they be set?

Interim deemed values: The JWG discussed whether interim deemed values should be set at 50% of annual deemed values as they are currently. It was noted that interim deemed values set lower than the cost of ACE reduce the incentives for fishers to acquire ACE before or directly after landing catch since cash outlays are reduced. Deemed values should provide the ability for individuals to reduce transactions costs by consolidating acquisitions of ACE (rather than acquiring ACE before or after each trip), but should not provide financial incentives to avoid acquiring ACE until the end of the fishing year. However, if deemed values are well above ACE prices, then a lower interim deemed value may be appropriate so that deemed values are still utilized to lower transactions costs as they were designed. For some stocks with concentrated ownership deemed values may need to be set significantly above ACE price in which case it may be advisable to set an interim deemed value at a lower level. The same may be true for certain "high value" species such as lobster and paua if deemed values continue to be set at 200% or port price. Current deemed values for other species are probably often well above ACE prices. Until policies for setting deemed values are changed (to target values slightly above ACE values), interim deemed values below annual deemed values may continue to play an important role.

Differential deemed values: Differential deemed values are meant to provide increasing individual and aggregate disincentives to take catch that can not be covered with ACE. If deemed values were set too low to keep total catch within 20% of an individual's ACE, differential deemed values provide

increasing penalties as overcatch increases. However, they can clearly create some economic inefficiency and may hinder the functioning of the ACE market. Economic efficiency can only be achieved when all individuals face the same marginal cost for ACE. Differential deemed values result in de facto ACE prices that differ across firms which implies that an efficient allocation of catch has not been achieved. Also, since firms with larger ACE holdings effectively pay lower average deemed values for a given level of overcatch, they face the same marginal cost of overcatch only at higher total levels of overcatch. Another perverse effect of differential deemed values is that they may decrease the incentives for ACE holders to sell ACE to those who need it to cover catch until the end of the fishing year. If individuals are then facing differential deemed values they may be willing to pay up a higher price for ACE.

If the key recommendations made here on principles for setting deemed values are implemented and have the desired effect, then differential deemed values may rarely be used. In the meantime, it would seem imprudent to remove an existing tool that may continue to prove useful in particular circumstances. However, care should be used in applying differential deemed values.

Retroactive increase in deemed value: In his report, Richard Newell (2004) suggested increasing deemed values for all fishers when aggregate catches exceed the TACC and charging that higher deemed value on all prior catches as well. This idea was rejected by the JWG. It would create difficulties for fishers since they would not know the deemed value they actually faced when fishing. If the increase was not retroactive it could create a race to fish.

Timing of deemed value setting: Currently deemed values are set well before the beginning of the fishing year and thus fishery managers can not utilize information on catch levels for the current fishing year relative to TACCs when determining the appropriate deemed value. It may be advantageous to wait to set the deemed values until levels of overcatch/undercatch for the prior year are known. However, if consultation is required, it might then be necessary to wait until after the beginning of the fishing year to set or at least to announce deemed values. It might be problematic to have deemed values change after the beginning of the fishing year. If there was an expectation that deemed values were going to increase, it would create incentives not to balance catch with ACE until they changed to ensure the lower deemed values applied to any catch that potentially could not be covered with ACE. If the new deemed value was announced after the fishing year had begun and was made retroactive to the beginning of the fishing year, it might create some problems for business planning including ACE pricing decisions. A compromise might be to announce provisional deemed values before the fishing year started subject to change early in the fishing year if new information at the end of the fishing year suggests the need for it.

3.5 How should operation and outcomes of the deemed value regime be integrated with the TACC setting process and other aspects of the management regime?

The JWG considered whether stock assessment working groups providing advice on TACCs should also provide advice on deemed values. The JWG agreed that working groups should not directly consider deemed values or provide advice on setting them. Deemed value decisions should remain with fishery managers, but fishery managers may need to request additional information from working groups in order to use deemed values effectively. For example, fishery managers may need more information about the risks of the fish stock falling below certain thresholds as total catches are increased. If small TACC overruns cause significant risks, more aggressive deemed value policies may be called for. On the other hand if risks are small it may be reasonable to use less aggressive deemed value policies, particularly with highly variable stocks where current abundance and appropriate TACCs may be uncertain. Managers may also need to request more information about the relationships between fish stocks. For example, how will an increase or decrease in the TACC of one stock affect catches of another stock? This information may be used in setting an appropriate TACC for the other stock or adjusting the deemed value of either.

The use of deemed values may differ somewhat for stocks managed under fishery plans. In general deemed values should be set slightly above the marginal value of ACE at the TACCs using best available information. Unforeseen circumstances such as increase in abundance or changes in prices or costs may result in deemed values being used to balance catch in excess of the TACC, but this would be unintentional and adjustments would be made (to TACC, deemed value or other management measures) in the subsequent year to avoid continued TACC overruns. Fishery plans might use deemed values differently. For example deemed values might be set well above the marginal value of ACE at the TACC in order to keep catch well below the TACC if stakeholders are shelving quota. In some cases a fishery plan might substitute some other catch balancing mechanisms for deemed values.

The JWG considered whether deemed values should be integrated with the compliance regime. For example, should compliance be targeted on fisheries where deemed values are set well above port price and or should deemed value revenues be used to pay for the extra compliance costs. The JWG agreed that there should be no direct linkages between deemed value policies and compliance policies and no financial linkage. As a matter of course, compliance should be responsive to situations where deemed value create strong incentives to discard, but specific actions should not be dictated. Under stock strategies, fishery managers may purchase additional compliance services in these cases. Under a fishery plan framework, stakeholders may want to implement special monitoring services purchased directly from a service provider (e.g., observer or VMS).

3.6 Distribution of Deemed Value Revenues

One of the primary issues being considered by the JWG is whether and how deemed value revenues should be returned to quota owners. The deemed value system plays a critical role in protecting the property rights of quota owners and ensuring sustainability, so it is important that any distribution of revenues from deemed values not compromise the incentives deemed values create to encourage individuals to balance catch with ACE and to constrain the overall catch within the TACC. However there may be ways to utilize or distribute deemed value revenues that will strengthen property rights and provide benefits to quota owners and the fishing industry as whole. We discuss below the reason for redistribution of deemed values to quota owners and issues associated with that possibility.

3.6.1 Reasons for Return of Deemed Values to Quota Owners

Currently all deemed value payments are transferred to the general fund and do not provide any benefit to the fishing industry. Yet catch in excess of the TACC balanced with deemed values diminishes the value generated by the fish stock for quota owners both in the short-run and the long-run. Deemed value is a perfect substitute for ACE so the price of ACE and the deemed value (assuming an efficient market) should not diverge unless the deemed value exceeds the ACE price that would constrain catch to the TACC. In the short-run, the deemed value can undercut the ACE price that would have prevailed if catch was limited to the TACC This reduces the revenue that quota owners could generate by selling ACE (area A in Figure 2). Some savings accrue to those purchasing ACE or using deemed values to cover catch as they effectively pay less for ACE than they would have were deemed values set high enough to constrain catch to the TACC. Some fishery rents are transferred to the Crown, which keeps the deemed values for catch that is not balanced with ACE (area C in Figure 2).

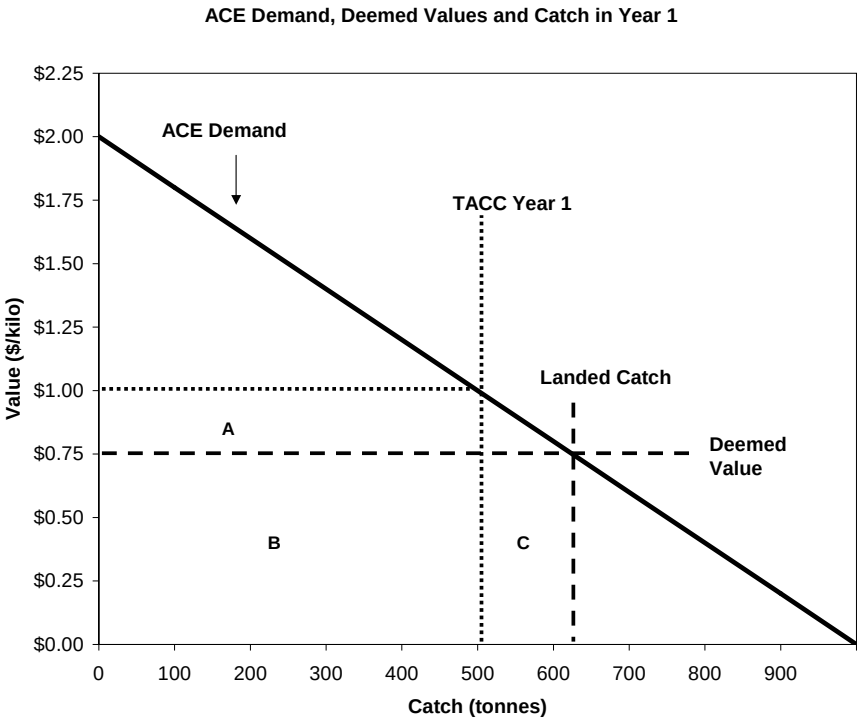

Figure 2: In year 1, the clearing price for ACE at the TACC was $1 per kilo. However, the deemed value is set at $0.75 at which price equilibrium catch is 625 tonnes. Quota owners are unable to attain a sale price above $0.75 and the value of their 500 tonnes ACE falls from a total of $500,000 to $375,000 (area B) representing a loss of $125,000 (area A) to quota owners. A total of $93,750 (area C) in deemed values is generated and transferred to the Crown.

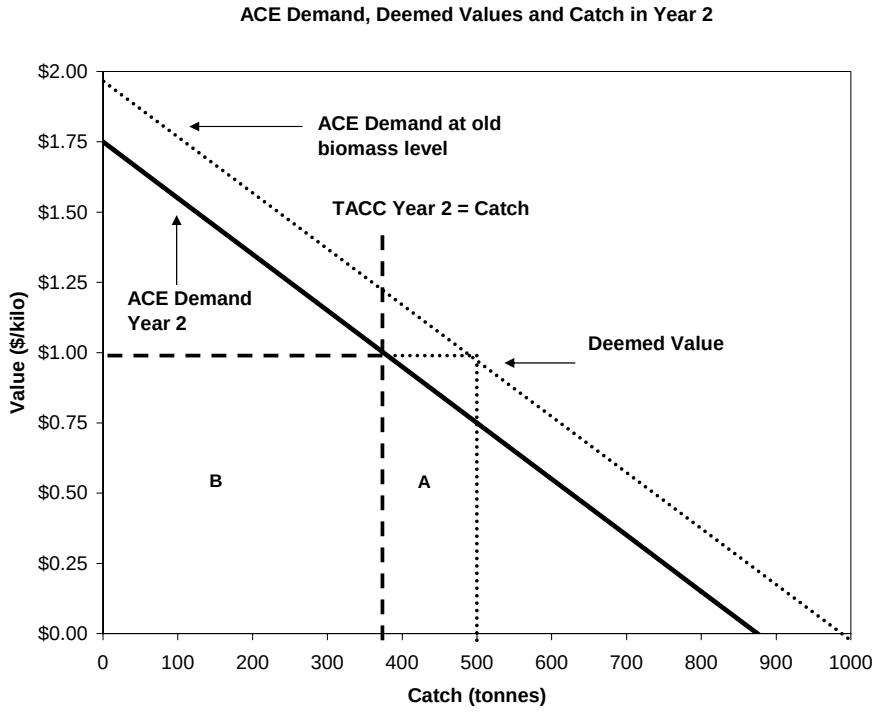

Figure 3: In year 2, the TACC is reduced to 375 tonnes to account for the overcatch of 125 tonnes in year 1. The demand curve shifts down as a result of increase harvest costs caused by reduced abundance. This time the deemed value is correctly set at the clearing price for ACE of $1, so catch is constrained at the TACC. The value of the ACE allocated to quota owners totals $375,000, (area B) representing a loss of $125,000 (area A) relative to what would have occurred had the TACC remained at 500 tonnes with an equilibrium price of $1.

The increased catch above the TACC also reduces future ACE and associated catch that would have accrued to quota owners by either causing future reductions in the TACC (Figures 3-4) or displacing TACC increases that would have been possible. The value of ACE is also reduced by a reduction in the stock size, which decreases catch rates and increases cost per unit of catch. As Figures 2-4 illustrate, the potential loss to quota owners from catches that exceed the TACC and are covered by deemed values exceeds the deemed values transferred to the Crown[7]. A return of those deemed values provides only partial compensation for the overcatch that was accommodated with deemed values.

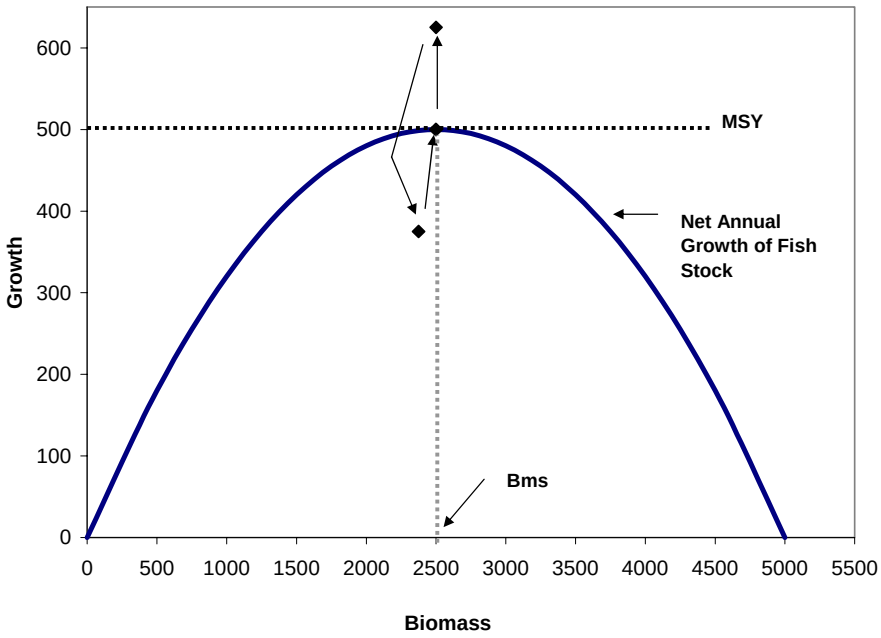

Figure 4: If catch is increased to from the MSY of 500 tonnes to 600 tonnes, the stock biomass declines. Catch has to be reduced (in this case to 375 tonnes) and the stock rises back to the biomass level that produces MSY (Bmsy). At that point the catch can be maintained at 500 tonnes keeping the biomass in equilibrium.

3.6.2 Scope of Deemed Values Redistributed

There has been some discussion of whether deemed values paid on catches above the TACC should be treated differently than those paid on catches within the TACC (that could have been covered by ACE but were not). In either case, the removal of fish without catch rights infringes on the property rights of quota owners to the extent that it reduces their future allocations of ACE. This is true whether or not total catch is above or below the TACC. Nonetheless, Forfeiting deemed values on catches that could have been covered by ACE provides positive incentives to quota owners to make ACE available in the market and thus improve liquidity in the ACE market. The JWG therefore favours an approach where deemed values collected only on catches in excess of the TACC are returned to quota owners.

The exception to this approach would be where quota owners have decided, through a collective management mechanism, to voluntarily maintain catches below the TACC if they believe it will increase the sustainable value of the fishery. In this situation quota owners should be compensated for

[7] Depending on the elasticity of ACE demand, the deemed value revenue may be more of less than the initial reduction in the value of ACE in the first year. However, the net loss to quota holders after reductions in the TACC in subsequent years will exceed the deemed value revenues generated as long as demand is downward sloping.

unauthorized catches that compromise their ability to do so. Thus, at least in the case where quota owners are acting collectively to shelve quota, deemed values below the TACC but above the desired total catch level (i.e., TACC minus shelved quota) should be returned to quota owners.

3.6.3 Preventing Perverse Incentives

There is a risk that returning deemed values directly to quota owners in proportion to their quota holdings may weaken or eliminate incentives for fishers to cover catch with ACE and to constrain aggregate catches with the TACC. We suggest that this would only be the case in limited circumstances and adjustments could be made for those cases. The rationale for this conclusion is supported by the game theoretic analysis in Appendix C.

The primary issue of concern is that it may be the quota owners themselves that are paying the deemed values as a result of landing catches in excess of their ACE holdings. If they are given back their money, would then have incentives to overfish the TACC? Would they not have the power to effectively set the TACC?

The above argument is valid only if quota owners collectively agree to exceed their ACE holdings by the same proportion. If one company owning 10% of total quota for a stock unilaterally landed catches that exceeded its ACE and paid deemed value, it would recover only 10% of the deemed value payments it made while the rest of the deemed value revenue would be distributed to the other quota owners. Effectively, the deemed value price paid would be the nominal deemed value multiplied by the proportion of total quota held by all other quota owners (90 percent of the nominal deemed value in the example above). If there is significant concentration of quota ownership for a given stock it might be necessary to increase the nominal deemed value to maintain effective deemed values at the appropriate level. For example, in a fishery with ten quota owners each owning 10% of the quota, a deemed value of $1.11 would be effectively the same as a deemed value of $1.00 without proportional redistribution of deemed value revenues.

Only if all quota owners exceeded their ACE in equal proportion, would the deemed values be exactly redistributed to those who paid them. This would obviously require the quota owners to conspire to overfish the TACC. But, presumably this would not be in their best interests if the TACC was set at the optimal economic yield already. As the discussion accompanied by Figures 1-3 illustrates, the deemed values generated in the example fail to fully compensate quota owners and presumably would not be in their best interest. There may, however, be cases where the appropriate TAC from a societal standpoint might be lower than the optimal economic yield (from the perspective of the quota owners). We explore below whether return of deemed values in this case might result in deliberate overcatch enabled by return of deemed values to quota owners.

One case where the economically optimal TACC (from the perspective of quota owners) might differ from the socially optimal TACC could result with a very slow growing species such as orange roughy. Because of its very slow growth rate, and depending on the discount rate of quota owners, it could be economically optimal to mine this fish stock or to pulse fish it (e.g. fish it down well below Bmsy and then let it recover with no fishing before fishing again). If commercial stakeholders were free to set the TACC they might choose to follow a less conservative policy than would government. By acting collectively, quota owners could effectively set the TACC by agreeing to overcatch their ACE holdings in equal proportion so that each company's deemed values would come back to them. However, acting individually, a quota owner who landed catch in excess of ACE would stand to lose the majority of the deemed value payments made since they receive back only the proportion equal to the proportion of total quota they own. The deemed value is reduced by this rebate and will only be an effective deterrent as long as the deemed value after the rebate is greater than the economic value generated by the catch.

Ways to address perverse incentives:

(a) The Minister can take other *actions to curtail overfishing*. If the deemed value system and the redistribution of deemed values to quota owners was being manipulated to undermine the catch balancing regime, the Minister could set overfishing thresholds that would stop individuals from fishing without ACE.

(b) The return of all deemed values to quota owners might unfairly affect *other user groups* is some cases. Where there are substantial recreational or customary fisheries for a particular stock, the excess catch on which deemed value is charged might infringe on those rights as well by reducing abundance and catch rates. Again, the deemed values still provide individual incentives that are only slightly weakened by return of revenues to quota owners and can be mitigated by a corresponding increase in the deemed value. As with the prior example, attempts to act collectively to effectively increase the TACC could be addressed through overfishing limits if necessary. The situation of shared fisheries is discussed in more detail below,

(c) Redistributing deemed value revenues to quota owners in proportion to quota holdings will favour larger quota owners. Deemed value would effectively vary across quota owners. Those with a higher proportion of total quota would face lower effective deemed values as they would receive a proportionally higher refund of any deemed value payments they made. The fact that different fishers face a different effective price for ACE (since deemed values are a perfect substitute for ACE) may result in some allocational inefficiency. One possible method to avoid reducing effective deemed values for quota owners with substantial shares of the total quota would be to return only a share of deemed values paid by others. For example, consider a situation where 5 quota owners each own 20% of the total quota and one quota owner exceeds his ACE and pays $10,000 in deemed values. Each of the four other quota owners would receive 20% of that revenue, $2,000 each for a total $8,000, while the quota owner paying the deemed value would receive nothing. This scheme is not without problems however. It may create incentives for quota owners to disassociate quota ownership from fishing activities since deemed value paid by non-quota owners would presumably still be returned to quota owners. This would be undesirable and may outweigh any benefits of the scheme relative to simply returning deemed values in proportion to quota holdings.

3.6.4 How to Redistribute Deemed Value Revenue

The JWG suggest that deemed value revenues paid on catches in excess of the TACC be returned to quota owners in proportion to their quota holdings at the beginning of the fishing year. The sum of deemed values to be returned would (assuming no differential deemed values have applied) would be equal to the annual deemed value multiplied the difference between the total catch and the total available ACE. In general, total available ACE should be equal to the TACC. In the case of a formal shelving program, total available ACE would not include shelved ACE.

One alternative to distributing deemed value revenue directly to quota owners would be to allocate this revenue to a special purpose fund associated with the stock on which the deemed values were paid. Such a fund might be used for research or other purposes and managed by an advisory group composed on stakeholders (quota owners, managers and possibly non-commercial stakeholders in the case of shared fisheries). This proposal would provide some compensation to quota owners by offsetting cost recovery levies to the extent the activities funded would have been funded through those levies. However, this scheme may tend to create incentives for overspending on research (or other activities funded by these revenues) and could create perverse incentives for fishery managers since research budgets would effectively be inflated with deemed value revenue. For this reason it is not recommended by the JWG.

3.6.5 Shared Fisheries and Redistribution of Deemed Value Revenue

The working group had some difficulty agreeing on the return of deemed value revenues collected in fisheries that are significantly shared with extractive users that do not hold quantified individual rights (recreational fishers and Maori customary fishers). The Ministry acknowledges the imprecision of management of non-commercial fisheries in terms of knowledge of the total take of stocks and about effectiveness of the management regime. However, over-catch by the commercial sector does have a detrimental effect on non-commercial as well as commercial interests in the stock. Because of the fishing techniques used, non-commercial interests are more likely to be adversely affected in the short term by any localised depletion and consequent changes in catch rates. However, the return of a share of revenues to non-commercial fishers would be impractical due to the dispersed nature of rights and their lack of quantification at the individual level.

The Crown, through the Ministry of Fisheries, currently funds that proportion of costs associated with non-commercial interests in fisheries. Thus any deemed value revenue attributable to the non-commercial interest in a stock should be retained by the Crown. The impact on their interests caused by over-fishing of a stock could be recognised by way of using deemed value revenue to fund research or management action directly related to the status of the stock or to addressing over-catch of that stock.

The aggregate catch quantity allowed for non-commercial uses, along with any other sources of fishing mortality such as illegal and unreported catch, is the difference between the TACC and the TAC (if a TAC has been set for the stock). If part of eligible deemed value revenues for shared stocks are to be returned to commercial quota owners, the proportion should be equal to the ratio of the TACC to the TAC, with the remainder retained by the Crown to provide research and services that address the interests of the non-commercial sectors. This might include offsetting the Crown's share of regular research expenditures for the stock.

The JWG notes an important transitional issue that must be resolved. There are some stocks in the QMS that do not currently have TACs set for them – only TACCs – including some shared stocks. This problem is being addressed as stocks are reviewed.

3.7 Retroactive Return of Deemed Value Revenues

Assuming the JWG's recommendations concerning repatriation of DV revenues are accepted, an issue arises as to the date from which the repatriation should commence. There was a delay in initiating the review, which was to have commenced in the second half of 2003. This delay was due principally to the work programme commitments of the Ministry (particularly the scampi enquiries). Had the review commenced earlier, the JWG may have reached its conclusions early enough for policy to have been changed in time to take effect for the 2004/05 fishing year. The Terms of Reference of the review noted that "Recognizing the delay in initiating the review, the recommendations may consider the possibility of applying the outcomes of the review as if the review had been completed by 1 October 2004."

There are arguments both against and for any retroactive repatriation of deemed value revenue.

Argument against retroactive repatriation:

1 The proposed revenue repatriation is part of a package of measures, other elements of which may well see (or have seen, if applied in the past) an increase in DV rates and changes in TACCs. These changes as an integrated package and that it would be wrong in principle to apply only one aspect retrospectively;

2 The changes to the regime are intended to bring about behavioural changes, the most important of which is to encourage fishers to harvest within the TACC. The retrospective application of part of the regime would not alter past behaviour;

3 While the Crown acknowledge that there were delays in resolving this issue, they saw the delays as having been legitimate with the issues worked through in good faith and were in part due to an increase in scope of the matters that needed to be considered by the JWG.

Arguments for repatriation of deemed value revenues paid in the 2004-05 fishing year:

1 On the introduction of cost recovery in 1995, the Crown had sought to avoid (recover) the full cost imposed on the Crown by the existence of a commercial fishing industry (the "avoidable cost" regime), yet gave no credit for the substantial DV revenues it received from the existence of the Industry;

2 These issues came to a head in 1998 when Industry brought a legal challenge to the cost recovery regime, which in part challenged the Crown's refusal to give any credit for DV revenue. The proceedings were discontinued so as to allow a Select Committee Inquiry to occur into the cost recovery regime;

3 That Select Committee Inquiry acknowledged that there was a considerable ambiguity in the legislation and recommended that the Government clarify it. The resulting amendments did not come into force until 1 February 2001 (and were not retrospective), leaving the position relating to the DV revenue between 1995 and 2001 unresolved;

4 Industry took the issue forward in the context of the Joint Working Group on the Under and Over Recovery of Levies (2001-2003), which finally reported in February 2003. Rather than delaying the completion of the Unders and Overs JWG report any further, it was recommended that a separate JWG process be undertaken to consider whether quota holders should be entitled to a proportion of the revenues paid as deemed values;

5 There was however a delay in initiating this review, which was to have commenced in the second half of 2003. This delay was principally due to the work programme commitments of the Ministry (particularly the scampi inquiries). Had the review commenced earlier, as had been the expectation of the JWG on Unders and Overs, this JWG may have reached its conclusions earlier enough for policy to have been changed in time to take effect for the 2003/04 fishing year;

6 The potential for this delay was recognised when the terms of reference for this JWG were established. They noted that "Recognising the delay in initiating the review, the recommendations may consider the possibility of applying the outcomes of the review as if the review had been completed by 1 October 2004". Industry had understood this potentially allowed for the 2003/04 deemed value revenue to be brought to account in this process;

7 While Industry acknowledges that the scope of this review has expanded and makes a range of more general recommendations concerning the deemed value regime going forward, the Industry did not believe that it would be prejudiced by the fact that this review was not completed in the time originally contemplated. In the interim the Crown has effectively

continued collect deemed values on catch in excess of the TACC, and has retained 100% of that revenue.

In the end both parties acknowledge that there is some force in the opposing arguments. To avoid the need for a split recommendation on this issue, the JWG agreed to recommend two potential options. Option 1 would return deemed values only once the recommended changes for setting and adjusting deemed values are implemented. The expectation is that this would occur for the 2005-06 fishing year. If at that time, deemed value policies had been changed but there was a delay in acquiring formal approval or amending legislation to allow repatriation of deemed value revenue, deemed value revenues would be returned directly to quota holders once formal approval was acquired or legislative changes enacted.

Option 2 would allow for the return of deemed value revenue for the 2004-05 fishing year. To avoid distorting the incentives provide by deemed values in the current fishing year, the JWG recommends that deemed values paid in the 2004-05 fishing be used to offset generic cost-recovery levies for the 2005-06 fishing year rather than be returned to quota owners of the stock they were paid on in proportion to quota ownership as is recommended in future years.

Appendix A: Objectives and Functions of Deemed Value in the Management System

The JWG identified five primary roles that deemed values play . These can be succinctly described as: 1) protecting property rights associated with ITQs; 2) ensuring sustainability; and 3) reducing transactions costs; 4) increasing flexibility of the TACCs setting regime; 5) controlling abuses of market power. While deemed values may be used in all of these roles, they are only one of a suite of mechanisms that are used to address these problems. Not all these roles are consistent with the way s75 of the Act is worded, although they may be consistent with the purpose of the Act. We discuss each of these roles in turn.

Protecting property rights: The primary consideration in setting deemed values according to the 1996 Fisheries Act is to provide incentives for individuals to hold or acquire sufficient ACE to cover their catch. Deemed values are, in effect, the fence around the property of quota owners. If deemed values are set below the level at which ACE holders would be willing to sell their ACE, the deemed value undermines the value of the ACE as an asset. They may also reduce the benefits for non-commercial fishers. If aggregate catches exceed the total ACE available and are balanced with deemed values, those catches presumably reduce the future catches that may be available to ACE owners and non-commercial fishers, and may also reduce the value of quota and noncommercial fishing allowances if CPUE falls and per-unit harvest costs rise.

Ensuring Sustainability: Since it is possible to fish without first acquiring ACE, and to legally cover catch with deemed values, deemed values clearly play an important role in limiting catches to avoid overexploitation. However, it must be noted that setting a deemed value high enough to discourage catches that can not be covered with ACE may lead to illegal and unreported discarding of catches in some circumstances. A range of mechanisms in the Act can address situations where there is a need for strong disincentives to discard (e.g., overfishing thresholds, observer coverage, permit revocation). If unreported discards are substantial they may have direct effects on sustainability and undermine the accuracy of the stock assessment. Assuring compliance when deemed values are well above the gross value of the fish landed is likely to be difficult and costly (as is the case with any mechanism to ensure compliance in such a situation).

Lowering Transactions Costs: Deemed values allow business entities to balance catch with catch rights after the fact. This allows an entity to maintain an ACE portfolio consistent with their expected needs rather than one sufficient to cover the highest possible need for each stock. Deemed values reduces the risk that a TACC will not be fully utilized due to a failure to distribute ACE to those who can use it caused by high transactions costs. Deemed values allow fishers to reduce the number of transactions required to acquire ACE since they do not need to acquire ACE at any point their catch exceeds ACE holdings. They can consolidate transactions, wait for better purchase opportunities and need only fully balance catches after the conclusion of the fishing year.

Flexibility in complying with TACCs: In multispecies fisheries it is difficult to set TACCs that will lead to maximum economic yield (MEY) from the combined stocks. Even in single species fisheries managers may fail to adjust TACCs optimally due to information deficits or inefficient processes. Acquiring information for TACC setting is expensive. The problem can be particularly acute in multispecies fisheries where information on the state and productivity of individual stocks must be supplemented with information on the degree to which harvest costs and feasibility of different stocks are related. If the catch balancing regime is rigid (and rigidly enforced), TACCs of some stocks may constrain catches of others stocks below their TACCs. This may not always be desirable in terms of generating the most value out of the complex of stocks. Although their The Fishery Act 1996 provides flexibility to set TACCs to achieve optimal use of a group of related fish stocks, this allowance is not currently being used. Allowing deemed values to substitute for ACE essentially allows flexibility in complying with TACCs that can reduce the economic inefficiency of not getting TACCs set at the optimal levels.

Limiting market power: If the balancing regime is strict, and there is significant concentration of ownership of quota/ACE, it might be possible for a quota owner or a cartel of quota owners to earn monopoly rents by restricting supply of ACE. High or ramped deemed values leading to higher ACE price, while important to ensuring sustainability, may reinforce the market power of some quota/ACE owners. Since deemed values are a substitute for ACE, they could be used to limit the ability of a quota owner or cartel of quota owners to restrict the supply of ACE below the TACC to extract rents from others in the fishery. While deemed values may be used to address market power concerns, this is not their intention. If intervention is required, tools that protect the market from anti-competitive behaviour should be investigated.

Conflicting Objectives: The fact that deemed values can and do play multiple roles suggest that they could be used to achieve multiple policy objectives. An accepted proposition of economics, originally proposed by Jan Tinbergen, is that when policy desires to achieve several objectives simultaneously, at least as many instruments as objectives are necessary for policy optimization (especially when tradeoffs between objectives are required). This suggests that we may need either to identify alternative policy tools to deal with the different problems/roles deemed values are meant to address or we need to make deemed value policies flexible enough to be adjusted to deal with different problems in different fisheries. The latter means that the balancing regime might be used in a specific way depending on the circumstance of an individual fishery. Care is needed to ensure that we are not still relying on deemed values to solve more than one problem for a given fishery (where action to achieve one objective conflicts with achieving another objective). As noted earlier, deemed values are only one of a suite of policy instruments available to deal with the problems discussed above. Careful consideration must be given to how deemed values policies complement or conflict with other policy instruments. Allowing flexibility in the use of deemed values places greater emphasis on the quality of decision making and may also motivate rent seeking behavior.