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Tracey Steel
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Dear Tracey

Thank you for the opportunity to comment on the 2009 Initial Position Paper relating to the Operational Plan for the squid fishery around the Auckland Islands (SQU6T). The concerns I raise below relate to how information/data/evidence from different sources are perceived and assigned weight in formulating the IPP annually. I also highlight that fishing-related mortality of New Zealand sea lions could be completely removed from SQU6T by reclassifying the squid fishery from a trawl fishery (SQU6T) to a jig fishery (SQU6J). This prudent move would eliminate the need for millions of dollars to be spent on setting, and defending, an annual fishing-related mortality limit (FRML).

Identifying "best available information"

In the absence of a Population Management Plan (PMP) for New Zealand sea lions, fishing-related mortality of NZ sea lions in SQU6T is managed under the Fisheries Act. The Act has the purpose of balancing the utilisation of the squid fishery (SQU6T) against the sustainability of the NZ sea lion population, such that "the Minister may take such measures as he considers necessary to avoid, remedy, or mitigate the effect of fishing-related mortality on sea lions" (IPP 2009, s 17). Furthermore, the Act states in s10 that the Minister when making his decision is required to take into account the following "information principles" that:

(i) "decisions should be based on the best available information";
(ii) "decision makers should consider any uncertainty in the information available in any case";
(iii) "decision makers should be cautious when information is uncertain, unreliable, or inadequate";
(iv) "the absence of, or uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of this Act."

[IPP 2009, s 18b]

Despite these clear principles to guide the Minister's decision making process, there does not appear to be a consistent application of these principles for all information used in formulation of the IPP or setting of a FRML. Furthermore, in the production of the current IPP and previous final papers given to the Minister, on which he bases his decision, MFish has consistently produced an abridged version of the "best available information". Consequently, the Minister does not have access to the "best available information", rather he receives a version of this information that MFish has authorised.

"Best available information" & setting the Predetermined Strike Rate

A good example of the use of inferior information is the setting of the predetermined strike rate (currently 5.65%), which is used to assess performance against the fishing-related mortality limit. The strike rate is based on "the modelled assessment of the mean strike rate for SQU6T vessels for each of … three fishing seasons: 2003-04, 2004-05, 2005-06", because since 2003 the use of SLEDs has ruled out the determination of the actual strike rate (IPP 2009, s 81). Strike rates in these years are based on poor observer coverage: 31%, 29%, 28% of trawlers had observers (Chilvers 2008a). Consequently, MFish tries to set a meaningful strike rate by modelling strike rate data from less than a third of the fleet and from boats that use SLEDs, which allow NZ sea lions, of unknown condition (see below), to escape the nets. This is despite the existence of a much more reliable estimate of actual strike rate, which was made when 100% observer coverage occurred and no functioning SLEDs were present (see below). This "best available information" is not presented to the Minister in his decision making process.

In 2000/01, observer coverage was 100% and SLEDs were in use but had their cover nets tied down, hence all sea lions killed in the nets stayed in the nets. In this year, a total of 38 individuals were killed, which equates to a strike rate of over 11%. This data, therefore, represents the "best available information" for setting the strike rate, yet it has been ignored due to false arguments that the NZ sea lion catches in that season were not representative and "clumped". [Data on NZ sea lion foraging locations demonstrates high site specificity (Chilvers 2008b) and no overlap between the two foraging strategies (benthic & pelagic foraging: Chilvers & Wilkinson 2009), hence this data cannot be considered "clumped".] Instead, the ridiculous situation exists in which the most reliable data ("best available information"), which incidentally cannot ever be repeated due to now uniform SLED use, is disregarded in favour of modelling poor quality data. The result is that a strike rate of 5.65% is used to assess performance against the FRML, instead of a truer estimate of over 11%. Consequently, the number of sea lions killed each year in the fishery is most likely grossly underestimated.

"Best available information" & setting the SLED Discount Rate

Another example of "best available information" being disregarded is in the setting of the SLED Discount Rate. The IPP acknowledges that the efficacy of SLEDs remains uncertain: "Recently, all vessels in SQU6T have used SLEDs; however there is some uncertainty about their efficacy" (IPP 2009, s 7). Despite this uncertainty, the SLED Discount Rate was increased from 20% to 35% in the 2007/2008 season, based on "improvements" to SLED design and necropsy information of NZ sea lions that did not escape trawl nets via SLEDs. It is important to note that

necropsied NZ sea lions died in the nets as they did not successfully exited out the SLED in the trawl nets, hence the SLED did not perform its design function – sea lion exclusion. It is also incorrect to referred to changes to SLED design as "improvements", given there is no evidence to suggest that any modifications have resulted in higher efficacy of SLEDs (see below), plus NZ sea lions continue to be drowned in trawl nets.

In 2001/02, SLEDs were sown shut to capture (but drown), all individuals that exited nets via the SLEDs. Necropsy indicated that 55% of individuals had injuries that significantly comprised their chances of survival (Wilkinson et al. 2003). Since this time, individuals that escape via SLEDs have not been available for necropsy, as they are ejected out of the net. Consequently, no information can now be obtained on potential injuries produced by SLEDs or NZ sea lion survivability.

Deepwater Group Ltd and the New Zealand Seafood Industry Council Ltd (DWG/SeaFIC) have spent considerable money on modifying SLED design (DWG/SeaFIC 2008/2009 submission, s 86), which they argue should result in the raising of the SLED Discount Rate from the current 35% to 50%. While MFish is not proposing to increase the Discount Rate this season (IP 2009, s 87), it is apparent that MFish deems modifications to SLED design may favourably contribute to a future SLED Discount Rate review (IPP 2009, s 88). Money may well have been spent on modifying SLEDs, but the real test is not in NZ sea lions just escaping nets, but escaping and surviving. After all, this is the aim of having SLEDs in trawl nets – to mitigate fishing-related mortality. Therefore, strong evidence must be presented that modified SLED design has improved NZ sea lion escapement and survival, rather than just allow drowned, seriously injured or unharmed individuals to be removed from the trawl nets.

The benefits of modifications to SLED design are currently unclear as NZ sea lions are still being caught and drowned in nets with SLEDs. Also, there is no evidence that a high proportion of NZ sea lions that may escape via the SLED will go onto survive. Necropsy data of NZ sea lions drowned in SQU6T, which could shed light on this matter, are inconclusive. Necropsy analysis requires freshly deceased (unfrozen) material, which presently is unavailable. Furthermore, as noted above, since 2001/02 necropsy data has only been available for NZ sea lions that did not escape trawl nets via SLEDs. Despite this, DWG/SeaFIC points to this necropsy data as proof of survivability (DWG/SeaFIC 2008/09 submission, S 86.1), and hence SLED efficacy. While MFish is cautious about the necropsy data, they allude to future necropsy data favourably contributing to SLED Discount Rate reviews (IPP 2009, s 98).

Video footage is also touted as "significant" evidence of SLED efficacy and used in arguments for an increase of the SLED Discount Rate (DWG/SeaFIC 2008/2009 submission, s 86.2). MFish also alludes to video footage favourably contributing to future SLED Discount Rate reviews (IPP 2009, s 88). Recently (2008-09) video footage showed a NZ sea lion and a fur seal escaping a trawl net through a SLED (IPP 2009, s 90). Despite no information available on the health of the NZ sea lion (IPP 2009, s 92) and concerns with the use of white light, which is known to attract sea lions, similar footage has been suggested as "significant information relating to SLED efficacy" (DWG/SeaFIC 2008/09 submission, s86). Based on the available information, concluding that SLEDs (improved or otherwise) have more than minimal efficacy is

the same as concluding that smoking is not a health hazard because there is a 100 year old chain smoker.

The "best available information" simply does not support SLEDs having high efficacy. Therefore, there was (and still is) no justification for increasing the Predetermined SLED Discount Rate from 20% to the 35% rate awarded by the then Minister in 2007/2008. Based on the considerable uncertainty in the evidence and the "information principle" of taking a cautious approach when faced with uncertainty outlined in s 10 of the Act (IPP 2009, s18b, (iii)), the present Minister should return the Predetermined SLED Discount Rate to the 20% mark set prior to the 2007/2008 season.

NZ sea lion decline & the fisheries management response

There is now no doubt that the New Zealand sea lion is in decline at the Auckland Islands and has been for the last 10 years. The evidence has been peer-reviewed in the international scientific literature (Chilvers 2008a) and acknowledged by the Ministry of Fisheries (IPP 2009, s 16). Furthermore, the IUCN has reclassified the NZ sea lion as vulnerable due to population decline and the New Zealand threat status of the species is presently being reviewed (IPP 2009, s 15). Yet despite the evidence of a population decline, there has been no change in the blunt instrument (FRML) available to the Minister to mitigate NZ sea lion mortality in the SQU6T fishery. In fact, the FRML has been significantly higher in recent years than any years before (data in Chilvers 2008a: 2005 = 115; 2006 = 96; 2007 = 91). Based on this, past Ministers must not have "take[n] measures under s 15(2) that he considers are necessary to avoid, remedy or mitigate the effects of fishing-related mortality on any protected species". In the current IPP, the proposed FRML ranges from 52 to 90. The Minister should therefore set a FRML that indicates he has attempted to mitigate the effects of fishing-related mortality: the FRML should be set at 52.

In many regards, the lack of action on mitigating the effects of fishing-related mortality on the NZ sea lion has mirrored the response to climate change. Initially there were very good intentions, until the cost of fighting climate change was understood. Once the real cost was known, the scrutiny of the best evidence began. Those opposed to the cost, often big business, question the integrity of the data and unfortunately also the people who collected it. The argument becomes one that ascribes rising global temperatures not to man-made climate change, but rather a natural cycle. This appears to be happening in the management of sea lion fishing-related mortality too.

The management of fishing-related mortality has moved to one of questioning the data; suggesting the population decline is natural; and clear statements that there is no direct link between fishing-related mortality and the decline in pup production. Indeed, the present IPP states: "the cause of the decline is not yet known, however there is no information to determine whether fluctuations in sea lion pup numbers are the direct result of fishing activity" (IPP 2009, s 56). This stance is odd, given that the rationale for setting a FRML is to "avoid, remedy, or mitigate the *effect* of fishing-related mortality on sea lions". Clearly there must be an "effect" of drowning predominantly females in SQU6T and indeed the IPP presents extensive modelling

using the Breen-Fu-Gilbert model seek a harvest rule to that minimises the effect of fishing-related mortality on the NZ sea lion population.

Placing this ambiguity aside, it is unclear what evidence, beyond what is already available, could establish a direct link between fishing-related mortality and the NZ sea lion population decline, given the high burden of proof on such data implicit in MFish's interpretation of the "information principles" of the Fisheries Act.

A change to jig fishing removes the need for a FRML

There is one absolute solution to fishing-related mortality of NZ sea lions in SQU6T, which is to convert SQU6T to SQU6J, whereby squid are harvested via jigging techniques.

Jigging for squid is considered to be one of the most targeted fisheries with very little bycatch (Sauer 1995). Indeed, observations of interactions of fur seals and squid jigging in southern Australian waters indicate that no fur seals are killed in the jig fishing process (Arnould et al. 2003). With a change to jigging in SQU6T, fishing-related mortality would disappear overnight. Squid jigging is used in other southern ocean squid fisheries off southern Australia, South Africa and as far south as around the Falkland Islands. The Falkland Island squid jigging fishery indicates that jigging is a viable fishing method for squid in the rough sub-Antarctic waters. DWG/SeaFIC argues that management of SQU6T by the setting of a FRML dramatically limits the utilisation of the squid fishery: "…Industry continues to be constrained in its utilisation of the squid fishery through the Minister's imposition of restrictive FRMLs." (DWG/SeaFIC 2008/2009 submission, s 12). A move to jig fishing would allow what the Industry desires, unconstrained utilisation of the squid fishery, as there would be no fishing-related mortality of NZ sea lions and hence, no longer a need for a FRML.

So what is the hurdle to making SQU6T a jig only fishery (i.e. SQU6J) and halting fishing-related mortality of NZ sea lion in SQU6T? One assumes the Industry would be keen to see the back of the FRML. Furthermore, DWG/SeaFIC have expressed concerned at the amount of money spent on management of fishing-related mortality in SQU6T over the last decade (DWG/SeaFIC 2008/09 submission, S 10, 11); setting a FRML has cost, not just the Industry, but also the New Zealand tax payer, millions of dollars over the past decade.

Despite this, there is unlikely to be a push for or agreement for SQU6T being reclassified to SQU6J. Currently, fishing in SQU6T plays an important part in the profitability of the southern ocean fisheries, in that the trawlers that fish for squid in SQU6T go onto fish in other lucrative southern ocean fisheries ["Moreover, because the SQU6T fishery is a critical component of the wider deep water fisheries in the southern ocean, utilisation constraints imposed in SQU6T raise the costs of harvest in these other fisheries." (DWG/SeaFIC 2008/09 submission, S 68)]. A change to jigging would need the additional cost of specialist jig fishing boats, as well as increasing harvest costs of other fisheries. Consequently, Industry is highly unlikely to agree to this important change, despite bemoaning the perceived restrictive nature of a FRML on utilisation of the squid fishery (DWG/SeaFIC 2008/2009 submission, s 12).

Logically, the solution to fishing-related mortality in SQU6T would be to jig for squid (i.e. change SQU6T to SQU6J). However, due to economic considerations, the unsatisfactory annual process of setting a FRML (a view also held by the Industry) is likely to be with us for another decade. This is unless the Minister takes the prudent step of initiating the process to have SQU6T reclassified to a jig only fishery (SQU6J), and thereby, removing all fishing-related mortality of NZ sea lions. This action would be consistent with the current government's policy of reprioritising spending. Indeed, the considerable dollars spent setting, monitoring and defending a FRML (even in court) could then be put to other worthwhile endeavours. This action would also be a major benefit to the conservation of the New Zealand sea lion, as the population would longer need to withstand annual fishing-related mortality of a large number of females.

Thank you again for the opportunity to comment on the 2009 IPP. I trust my submission will be given your due consideration.

Sincerely

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