

APPENDIX EIGHT

Aranovus Research Methodology

APPENDIX 8 ARANOVUS RESEARCH METHODOLOGY

1 In July 2007 the Ministry of Fisheries (MFish) contracted Aranovus Research Limited (Aranovus) to assess the socio-economic impacts of options proposed to mitigate the effects of fishing on Hector’s and Maui’s Dolphins, on commercial and recreational fishers, as outlined in the Threat Management Plan (TMP). The final report, entitled “A Socio-Economic Impact Assessment of Fishers: Proposed Options to Mitigate Fishing Threats to Hector’s and Maui’s Dolphins”, was delivered to MFish on 3 December 2007.

2 This attachment describes the research MFish contracted to Aranovus. It sets out the objectives, scope and methodology, and data analysis employed by Aranovus. It reports on the submissions that stakeholders made on the report and an ad hoc working group meeting held on February 4 2008.

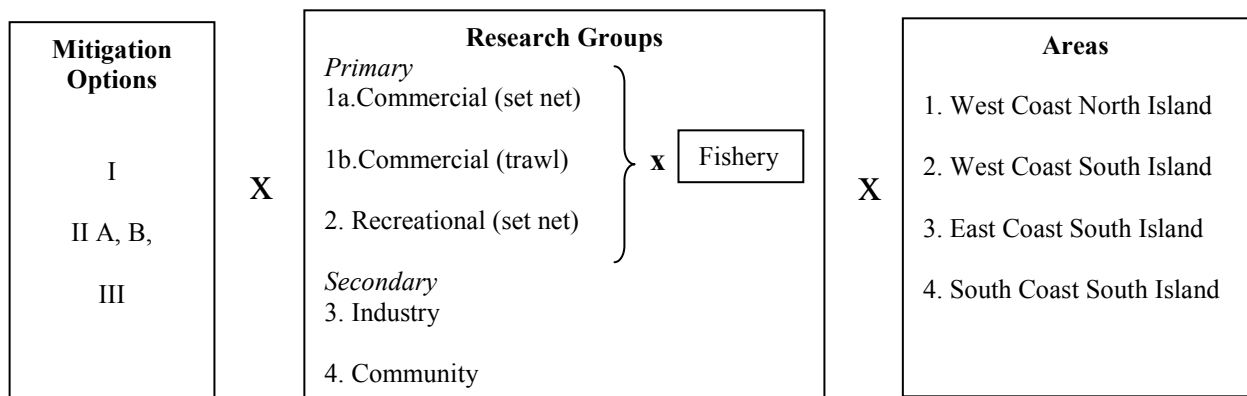
The Aranovus Research Objectives

3 The purpose of the research was to provide MFish with an independent assessment of the impacts of the proposed options, in order to inform policy analysis on reducing the risk of fishing to Hector’s and Maui’s Dolphins. The research objectives were:

- a) To survey relevant fishers (commercial and recreational) and other relevant industry participant across four distinct areas – West Coast North Island (WCNI), West Coast South Island (WCSI), East Coast South Island (ECSI) and South Coast South Island (SCSI).
- b) To use the survey information and relevant MFish information on catch levels and the value of catch and quota to determine the likely impact of the options on social, economic and cultural wellbeing of extractive user groups.
- c) To present an assessment of each option in terms of likely impact on relevant extractive users within each of the four areas.

4 The research was designed to capture qualitative and quantitative information from a number of sources representative of different spatial areas, different fisheries and for different types of fisher likely to be affected by options outlined in the draft TMP (Figure 1).

Figure 1: Research Design



Source: Aranovus Research proposal 10 July 2007, p.3

5 The primary research subjects were set net and trawl fishers that fished in one or more of four distinct regions defined by Hector's and Maui's Dolphin's range.

6 Three proposed options were assessed for each fisher group, in each region, ranging from the development of a voluntary code of practice to full set net and trawling bans from 2-18 nautical miles (nm) offshore, depending on the region. Several options had spatial and temporal variants and/or were comprised of a cluster of measures. In total, Aranovus analysed 15 different unique measures and over 40 different combinations of measures tested on three different fisher groups in four different regions of New Zealand (Aranovus p.28).

7 In effect, the Aranovus report consists of 12 surveys (three groups of fishers in four regions) where each survey targeted a population of commercial fishers (i.e. ~10-100 fishers) and a larger population of recreational set netters (i.e. ~100-500) in each region.

The Scope of the Aranovus Report

8 MFish identified commercial trawl, commercial set net, and recreational set net fishers as the core groups for which the impacts of the proposed mitigation options were to be assessed. Although the focus was primarily on fishers, MFish indicated that, where practicable, Aranovus should assess flow-on impacts to, for example, communities and service industries. The spatial areas for the Aranovus report were established using the options outlined in the draft TMP. MFish did not provide a temporal boundary for the project.

Methodology

9 Aranovus designed a methodology to collect empirical data from a broad range of affected fishers, while providing highly detailed information from a smaller sample. In the case of commercial fishers this, data was then triangulated with secondary data on catch effort and fish landings over the 2003/4-2005/06 fishing years. In addition Aranovus developed a web-based enrolment form that enabled fishers (and others) to read information about the research and select different levels of participation.

10 Aranovus used a rapid socio-economic impact assessment approach augmented with in-depth interviews and secondary data analysis to determine the impacts of the proposed plan (Aranovus p.29). Socio-economic impact assessment (SEIA) is a tool for assessing, in advance, the socio-economic consequences that are likely to flow from specific policy actions.

11 Rapid assessments are undertaken quickly, often in only four to eight weeks depending on the particularities of a project and access to potentially affected parties and their capacity to provide useful information (Aranovus p.30). Rapid assessment involves limited engagement with affected parties. Short intensive interactions such as focus groups, interviews and questionnaires are often used to provide information on key impacts, identify which stakeholders will be affected and why, and to indicate the magnitude of impacts.

Focus groups

12 Focus groups are a research method involving a group discussion, usually with six to twelve participants. Interaction between members is a key feature of this research method, and it is generally characterised by dynamism and energy as people respond to the contribution of others. A strength of focus groups is that participants share and test their ideas within the group. Information generated is both quantitative and qualitative and relates to the group's attitudes, experiences, behaviours/practices and reactions, as well as indicating the degree of consensus or difference within a group.

13 In this project, focus groups with separate stakeholders were the norm. In the case of focus groups involving commercial fishers, a number of industry participants in addition to fishers (small and large processors, Licensed Fish Receivers (LFRs), marine services, retailers, national and regional fisher representatives and politicians) attended. Often a far greater number attended than was initially invited. Most Focus groups lasted two to three hours (Aranovus p.46).

14 In addition to notes and audio-recordings, Aranovus used *Decision Explorer* software to capture the thoughts and responses of the group in the form of what they refer to as belief maps, or cognitive maps or causal maps (Aranovus p.46).

15 A total of 18 focus groups took place between August and October 2007 involving 247 participants. All focus groups used the same facilitator/researcher so consistency was maintained across the focus group process. There were nine focus groups with commercial fishers and nine with recreational fishers spread across the different groups (commercial set net – CSN, commercial trawl – CT, commercial set net and trawl – CSN/CT, and recreational set net fishers – RSN) and regions as shown in Table 1 (Aranovus p.45).

Table 1: Focus group summary

Coast	CSN	CT	CSN/CT	RSN	Total
WCSI			1	3	4
ECSI			4	4	8
SCSI	1	1		1	3
WCNI	1		1	1	3
Total	2	1	6	9	18

Source: Aranovus, p.45

In-depth interviews

16 Seventy-nine in-depth interviews were conducted throughout the data collection period across the different regions and groups as shown in Table 2. Interviewees were recruited by volunteering to be interviewed through a web-based enrolment form, by phoning Aranovus directly, during focus groups or were approached by Aranovus following a recommendation (i.e. snowballing). All interviews were carried out by Aranovus staff.

17 In-depth interviews were semi-structured and followed a similar format to the focus groups. Interviews involved detailed discussion of fishing practices, how and why these practices had developed, sensitivity to change, opportunities and constraints, exit strategies, affect of options on income and costs, and affects on family, community and suppliers. Interviewees were asked about their own interactions with Hector's/Maui's Dolphin, attitudes and beliefs regarding the proposed options and suggestions for resolving the problem (Aranovus p.46).

Table 2: Interview summary

Total		79
WCSI	CSN	1
	CT	12
	RSN	4
ECSI	CSN	10
	CT	15
	RSN	13
SCSI	CSN	4
	CT	5
	RSN	2
WCNI	CSN	6
	CT	2
	RSN	1

Source: Aranovus, p.47

Questionnaires

18 Twelve different questionnaires were developed to accommodate the wide range of fisher – area - options/measures combinations. In addition, an option booklet for each region was provided with each questionnaire (the Aranovus report includes an appendix that contains samples of all twelve questionnaires).

19 Questionnaires were lengthy and sought both quantitative and qualitative information and aimed at eliciting information about current fishing practice and how the options would affect this. The recreational questionnaires sought information on the value that set netting provided beyond the material benefits. Tables 3 and 4 show that 569 questionnaires were distributed with an overall return rate of 41% (236 questionnaires). The return rate was fairly consistent between regions but varied from 22-74% between fisher types. Almost 60% of questionnaires were issued to recreational fishers (Aranovus p.47-48).

Table 3: Questionnaire sampling by region

Coast	Issued	Returns	Response
Total	569	236	41%
WCSI	138	49	36%
ECSI	217	89	41%
SCSI	57	24	42%
WCNI	157	74	47%

Source: Aranovus, p.48

Table 4: Questionnaire sampling by fisher type

Coast	Fisher	Issued	Returns	Response
Total		569	236	41%
WCSI	CSN	9	2	22%
	CT	41	12	29%
	RSN	88	35	40%
ECSI	CSN	46	18	39%
	CT	65	22	34%
	RSN	106	49	46%
SCSI	CSN	12	5	42%
	CT	22	15	68%
	RSN	15	4	27%
WCNI	CSN	38	28	74%
	CT	5	2	40%
	RSN	114	44	39%

Source: Aranovus, p.48

Data Analysis**Primary Data**

20 Primary data was both quantitative and qualitative. Data collected from interviews, questionnaires and focus groups was sorted around key themes, quantified (where appropriate) and summarised by fisher group and region. These group–region summaries from the different primary data methods were compared in a triangulation process to generate a detailed group specific description of behaviour and impacts while indicating the magnitude and extent of deviations.

21 In most cases the regional summaries for commercial fishers were developed from a compilation of sub-region data (e.g. Kaikoura, Lyttelton, Timaru and Port Chalmers, Bluff, Greymouth, Westport, New Plymouth, Kaipara, Manukau) because that was where the majority of data was sourced and because that is where, within a region, the majority of fishers were based. These sub-regions were aggregated to give regional summaries as was required by the research scope. While data from recreational fishers is weighted toward provincial centres, data (especially questionnaires) was received from recreational fishers from a wide range of locations outside these centres.

Secondary Data

22 Secondary data analysis was only undertaken for commercial fishers. There is very limited secondary data available for recreational fishers. The dataset used for the secondary data analysis was sourced from MFish's *catch_by_client database*. Detailed data files were provided to Aranovus by MFish for the fishing years 2003/04, 2004/05 and 2005/06 for each of the four regions and included information for the relevant statistical areas (Aranovus p.52)

23 Set net, ring net and drift net fishers were extracted from the secondary data to produce a "Set Net Dataset" file. Trawl fishers were similarly extracted to produce a "Trawl Net Dataset" file. For trawl fishers, only bottom trawl fishers were extracted for WCSI, ECSI and SCSi as information from fishers surveyed by Aranovus indicated that this was the only method used to target inshore species. All trawl methods were considered for WCNI. Only secondary data from the 2005/06 fishing year was used in the analysis. This was partly due to the time constraints on the research and partly because the 2005/06 data represented the most current data for each fishery.

24 The aim of the analysis was to generate a range of information on commercial set net and trawl fishers that enabled an estimation of:

- a) The direct economic value of the set net or trawl fishery to fishers, and a measure of the potential direct economic loss as a result of the impacts of the options.
- b) The number of fishers likely to be affected, the distribution of the impacts amongst the fishers and the relative magnitude of the impact for individual fishers. This was achieved by comparing each fisher's relative contribution to the total fishing method catch and their reliance on that fishing method (i.e. what other methods did they use and what contribution to their total catch was attributed to these different methods).
- c) Relative magnitude of the impacts at an industry level. The analyses also allowed the inshore set net and trawl fisher information to be put into a broader context by comparing it with industry wide data (i.e. total catch, total catch species, total fishers and all set net fishers) for each region.

25 The analysis of secondary data for trawl fishers and set net fishers was undertaken as detailed below, with some variation between these two groups as noted (this section draws extensively on the Aranovus report pp.54-61).

Commercial trawl

26 Summary inshore bottom trawl statistics were produced for each region. They include the following information:

- a) Total catch (all methods) is the total green weight (kg) of catch summed from all the species and methods for each region for 2005/06.
- b) Total bottom trawl catch was calculated by summing the catch of all species caught by bottom trawl for WCSI, ECSI and SCSI. WCNI total includes species caught by bottom pair trawl and mid water trawl.
- c) Total inshore bottom trawl catch is the sum of the catch of all inshore species caught by bottom trawling.
- d) Value of inshore bottom trawl species was calculated by multiplying port price listed for each inshore BT species by the total catch (kg) of each inshore species for each region.
- e) Weight bottom trawl catch/total catch gives the proportion of the total catch that is made up of bottom trawl catch.
- f) Weight inshore bottom trawl/bottom trawl catch shows the contribution that inshore bottom trawl catch makes to the total bottom trawl catch.
- g) Weight inshore bottom trawl/total catch shows the contribution that inshore bottom trawl catch makes to the region's total catch.
- h) Total fishers (all methods) is the total number of fishers in each region.
- i) Bottom trawl fishers were all fishers who used bottom trawling as a method.
- j) Inshore trawl fishers were those who had some percentage of their total trawl catch came from inshore species.
- k) Exclusive inshore fishers were those for which inshore species made up >80% of their total catch.
- l) Inshore bottom trawl fishers/total fishers is the proportion of total fishers that are inshore bottom trawl fishers.

Distribution of catch among fishers

27 Inshore bottom trawling catch and total catch from all other methods was calculated for each individual fisher. This was used to calculate the percentage of their total catch that came from inshore bottom trawling. The results were ranked and showed the relative contribution of each fisher to the total catch.

Economic value and potential loss of value under the options proposed in the draft TMP

28 **Total Economic Value** - these tables show the total economic value from inshore bottom trawling for each region determined by multiplying catch weight (kg) by 2005/06 port price (supplied by MFish) for the main fish species.

29 **Loss of Value to Fishers** - this analysis was informed by the primary data as the secondary data did not have sufficiently detailed spatial and temporal data to assess the options. A percentage loss of each fish species under each proposed option was estimated and this value used to calculate the dollar loss under each option. The percentage loss estimates were based on information provided by inshore bottom trawl fishers. The percentages used for this calculation are given in Table 5.

Table 5: Percentage loss of inshore bottom trawl catch under each proposed option for each region.

a) West Coast South Island

Species	Catch (kg)	% Catch lost	
		Option 2	Option 3
FLA (all)	587401	5	60
GUR	322226	20	35
RCO	1716406	20	35
TAR	685443	20	35
SPO	30019	0	50
ELE	20053	0	50

b) East Coast South Island

Species	Catch (kg)	% Catch lost	
		Option 2	Option 3
FLA (all)	715341	5	60
GUR	565706	20	35
RCO	2704180	20	35
TAR	1030002	20	35
SPO	38441	0	30
ELE	741346	0	30

c) South Coast South Island

Species	Catch (kg)	% Catch lost	
		Option 2	Option 3
FLA (all)	200855	0	50
GUR	95576	20	40
RCO	66305	20	40
TAR	15381	20	40
SPO	6984	0	20
ELE	50159	0	20

d) West Coast North Island

Species	Catch (kg)	% Catch lost	
		Option 2	Option 3
BAR	2266206	20	60
FLA	6688	20	90
GSH	8005	20	90
GUR	501571	5	50
JDO	63011	5	80
KAH	124697	10	80
SCH	50192	5	50
SNA	732013	10	80
SPD	10208	5	50
TAR	125933	5	50
TRE	1009770	10	80
WAR	5510	10	100

Source: Aranovus, p.56-57

Commercial Set Net

30 For the WCNI, only set netters and ring netters were considered, as drift netting made up a negligible portion of the total catch (Aranovus estimated the value of WCNI drift netting as \$96,170). In all other regions, set netting only was considered. Drift netting was excluded to ensure the comparability of across the regions.

31 For each region the following variables have been summarised:

- a) Total catch (all methods) is the total green weight of catch summed from all the species and methods within each region for 2005/06.
- b) Total set net catch refers to the total green weight of all species caught by set net for 2005/06 for each region and was determined by summing the individual set net catch records.
- c) Value of set net species is the set net catch multiplied by port price for each species and summed for each species that makes up the top 95% of the total set net catch.
- d) Weight set net catch / Total catch is the total set net catch weight divided by the total catch weight from all species and all methods to show what proportion set netting contributes to a region's total fish catch.
- e) Total catch species is the number of different species caught by set net in each region.
- f) Species in 90% and 95% total catch is the number of different species that make up 90% and 95% of the set net catch. These two measures provide a good indication of the number of species that make up the set net fishery in each region and in particular show the how the set net fishery is reliant on a limited number of species for the bulk of its value.
- g) Total fishers (all methods) is the number of commercial fishers (all methods) in each region.
- h) All set net fishers is the number of fishers who used set netting as a fishing method.
- i) Exclusive set net fishers are those who used set netting to catch >80% of their total catch weight.
- j) Set net fishers/All fishers is the percentage of fishers who use set netting as a fishing method compared to all fishers.

Distribution of Catch Among Fishers

32 Fish catch from set netting and total catch from all other methods was calculated for each individual fisher within each region. This was used to calculate the percentage of each fisher's total catch that came from set netting. The results were ranked and showed the relative contribution of each fisher to the total set net catch. The fishers were grouped into percentile groups and the number of fishers in each group is given in the table (see Tables 6 and 7) along with the percentage of the total set net catch that group contributes.

Table 6: Distribution of set net catch among fishers for each region

a) West Coast South Island

			Individual SN fisher catch / Total individual fisher catch			
Individual SN catch as % Total WCSI SN catch	Number of fishers	% Total WCSI SN catch	100-75 %	75-50 %	50-25 %	25-0 %
>20%	2	43	1	-	1	-
11-20%	2	24	-	1	-	1
6-10%	4	32	3	-	1	-
2-5%	0	0	-	-	-	-
0-1%	4	1	3	-	-	1
Totals	12	100%	7	1	2	2

b) East Coast South Island

			Individual SN fisher catch / Total individual fisher catch			
Individual SN catch as % ECSI Total SN catch	Number of fishers	% Total ECSI SN catch	100-75 %	75-50 %	50-25 %	25-0 %
>20%	0	0	-	-	-	-
11-20%	1	18	1	-	-	-
6-10%	5	42	5	-	-	-
2-5%	11	32	4	3	2	2
0-1%	44	8	27	2	2	14
Totals	62	100%	37	5	4	16

c) South Coast South Island

Individual SN fisher catch / Total individual fisher catch

Individual SN catch as % Total SCSI SN catch	Number of fishers	% Total SCSI SN catch	100-75 %	75-50 %	50-25 %	25-0 %
>20%	3	85	3	-	-	-
11-20%	0	0	-	-	-	-
6-10%	1	8	-	-	-	1
2-5%	2	6	-	1	1	-
0-1%	5	1	1	1	1	2
Totals	11	100%	4	2	2	3

d) West Coast North Island

Individual SN fisher catch / Total individual fisher catch

Individual SN catch as % Total WCNI SN catch	Number of fishers	% Total WCNI SN catch	100-75 %	75-50 %	50-25 %	25-0 %
>20%	1	21	1	-	-	-
11-20%	-	-	-	-	-	-
6-10%	2	16	2	-	-	-
2-5%	11	28	10	1	-	-
0-1%	93	35	66	6	11	10
Totals	107	100%	79	7	11	10

Source: Aranovus, p.93-94

Table 7: Distribution of drift net catch among fishers for WCNI Only

			Individual DN fisher catch / Total individual fisher catch			
Individual DN catch as % Total DN catch	Number of fishers	% Total DN catch	100-75 %	75-50 %	50-25 %	25-0 %
>20%	2	82	2	-	-	-
11-20%	1	17	-	-	1	-
6-10%	0	0	-	-	-	-
2-5%	0	0	-	-	-	-
0-1%	1	1	-	-	1	-
Totals	4	100%	2	0	2	0

Source: Aranovus, p.95

33 These tables identify the number of fishers likely to be impacted (i.e. number of fishers), the level of each fisher's catch which could be impacted by the options (e.g. 100-75%, 75-50% etc), the contribution to the regional set net catch by each set net fisher (i.e. % Individual SN catch as % of Region Total SN Catch) and the collective contribution to the regional set net catch by groups of set netters (i.e. % Total Region SN Catch) in different individual contribution bands.

Economic Value and Potential Loss of Value Under the Options

34 ***Total Economic Value*** - these tables show the economic value from set netting for the region determined by multiplying catch weight (kg) by 2005/06 port price (supplied by MFish) for the main fish species. The main fish species included were those that made up 95% of the total set net catch for WCSI, SCSI and WCNI and 90% of total set net catch in ECSI. The longer list of species for the ECSI reflects the diversity of marine environments and fish species caught by set net on such a long stretch of coast.

35 ***Loss of Value to Fishers*** - this analysis was informed by the primary data as the secondary data did not have sufficiently detailed spatial and temporal data to assess the options. A percentage loss of each fish species under each proposed option was estimated and this value used to calculate the direct economic loss under each option (see Table 8 below). The percentages used for the catch value lost under each option are based on information provided by set netters surveyed. Fishers were asked to estimate and explain the loss of catch likely under each option.

Table 8: Percentage loss of set net catch under each proposed option for each region

a) West Coast South Island

		% Catch lost						
		Option 2A			Option 2B			Option 3
		0-2 nm			0-4 nm			0-6nm
Species	Catch (kg)	D-F	O-M	J-D	D-F	O-M	J-D	J-D
SCH	68247	1.8	3.5	5	3.5	6.5	10	35
SPO	59087	29	70	75	32	79	85	95
LIN	38739	0	0	0	0	0	10	25
SPD	10010	0	0	10	0	0	30	65
ELE	5895	44	78	80	50	87	90	100
WAR	3499	9	26	40	15	45	70	100

b) East Coast South Island

		% Catch lost			
		Option 2A	Option 2B	Option 3	
		0-2 nm	0-4 nm	0-12 nm	
Species	Catch (kg)				
SPD	282677		10	20	80
TAR	199287		70	80	90
SPO	168609		80	90	100
ELE	162174		50	70	80
HPB	140026		70	80	90
SCH	126767		5	10	75
BSH	122673		70	80	90
MOK	52136		5	10	20
LIN	50670		70	80	90
BFL	25389		50	60	75
FLA	24482		50	60	75

c) South Coast South Island

		% Catch lost		
		Option 2A	Option 2B	Option 3
Species	Catch (kg)	0-2 nm	0-4 nm	0-12 nm
SCH	315836	5	10	75
SPD	123710	10	20	80
SPO	84083	50	80	100
ELE	23301	90	100	100
CAR	15529	5	10	50

d) West Coast North Island

		% Catch lost		
Species	Catch (kg)	Option 1	Option 2	Option 3
GMU	623,107	19	69	100
SCH	210,926	0	1	100
SPO	158,619	11	30	100
FLA	152,558	9	64	100
YBF	91,902	2	73	100
KAH	43,385	10	59	100
TRE	32,428	14	62	100
SPD	21,697	0	2	100

Source: Aranovus pp.60-61

36 Because butterfish and flatfish are minor species in ECSI and SCSi, options 2A and 2B in the report are effectively 2nm and 4nm bans. Temporal restrictions are sub-options for Option 2A and 2B for WCSI.

37 Data analysed for the WCNI included drift netting and ring netting.

38 For the WCNI, Option 1 was assumed to only affect the harbours with 0% loss of catch for Statistical Area 44 (Kaipara Harbour) and 75% loss of rig (SPO), school shark (SCH), spiny dogfish (SPD), 50% loss of grey mullet (GMU), 30% loss of kahawai (KAH) and trevally (TRE) and a 20% loss of flatfish (FLA) and yellow belly flounder (YBF) in the Manukau Harbour. These percentages were then applied to the catch weight of those species in the Manukau Harbour Statistical Area before these catch reductions were converted into a percentage loss applying to the whole WCNI region (see Table 8d).

39 WCNI Option 2 losses were calculated from catches from the Manukau Harbour and Kaipara Harbour; with an additional 2% total catch allowance added to account for other losses due to other harbour closures. Losses were then estimated as 60% loss due to the no night setting provisions of Option 2 and a further 20% loss due to attendance requirements.

40 WCNI Option 3 losses were assumed to be 100% with an allowance also made for the part of Statistical Area 40 affected. This allowance was calculated as 20% of the catch weight of species caught in Statistical Area 41 added to those species total catch weight.

Overlapping Participation

41 Occasionally in social research there is concern about the level of overlap by participants in the different primary data methods. This concern is due to a perception that this double-dipping reduces the robustness of the data. Most researchers face the question of quantity or quality and where possible attempt a compromise, such as the extensive and intensive approach taken in the Aranovus report. It is entirely appropriate, given the research circumstances, to gather as much information from as many affected parties as possible by all methods and not to deny participation. However, it is important under such conditions to ensure that individuals only participate in each method once, as was the case in the Aranovus report.

42 With surveys it is typical for questionnaires to be completed by all participants that attended focus groups or were interviewed. This not only provides a general description of each participant, but also allows a more reflective and private response to questions. It also gives the respondent time to collect quantitative information for certain questions that they may have answered from memory.

43 Aranovus observe that in this survey, the frequency and degree of overlap varied between regions. The average overall overlap was approximately 30% for commercial trawl fishers, 50% for commercial set netters and 30% for recreational set netters. For commercial trawl fishers, 60%-70% of participants from all regions were involved in only one method. For commercial set net fishers the rates of participation in a single method only are approximately 50% (WCSI), 30% (ECSI), 45% (SCSI) and 65% (WCNI). Participation rates in a single method only for recreational set netters are approximately 80% (WCSI), 65% (ECSI), 50% (SCSI) and 85% (WCNI) (Aranovus p.49).

Validity of Responses

44 In any research that involves drawing out participants' opinions and judgements, there is a concern about the validity of responses. Respondents may exaggerate the impacts of a proposal (negatively or positively) to favour a desired outcome. Forums such as focus groups are often subject to game playing by participants as they are public performances that are both enabled and constrained by social conventions and the expectations of other participants. For example, participants may make a claim based not on what they know, but rather on who is in the room and what they would want the researcher to hear.

45 Aranovus considers that in this research the techniques used and the triangulation of methods and questions reduced the possibility of manipulation at the group and individual level. For example, in focus groups and interviews the researchers persistently asked participants to validate their responses if they were considered to be exaggerations. Researchers also asked questions in different ways to help respondents to formulate their responses. Confirmation of a response was always sought from the group or individual, and sometimes by another participant. In addition, because the questioning began with a description of current fishing practice before applying the options, it was difficult to exaggerate impacts without raising attention because the context had been set in advance (Aranovus p.50). Moreover, before Aranovus met with commercial fishers it had spent time analysing the secondary data on catch effort and landings by individual commercial fishers in each region.

46 Aranovus is of the opinion that fishers intended to give honest responses. In some cases, where quantitative estimates were required fishers had to make best estimates on the spot. The accuracy and context of such measures were often discussed which helped respondents determine an estimate more accurately.

REVIEW OF THE ARANOVUS RESEARCH REPORT: SUMMARY OF SUBMISSIONS

47 A number of stakeholders (e.g. SeaFIC, Challenger Finfish, SE Fin Fish) raised concerns that the Aranovus research would be completed after the due date for submissions on the draft TMP. For example SeaFIC noted that:

“The material from Aranovus should be incorporated into the IPP as should the Ministry’s analysis of this material and its views on how the socio-economic impacts affect the balance between sustainability and utilisation. Further, principles of good consultation as set out by the Courts require that submitters be given adequate opportunity to see and comment on the Aranovus material and the Ministry’s thinking on it.”

48 SeaFIC (and a number of other submitters) believed that the public should have an opportunity to comment on the Aranovus report as it could form a crucial part of the advice to the Minister.

49 Given the volume of submissions made on the draft TMP and the level of detail contained within, the Minister extended the time available for Ministry staff to develop final advice to mid March 2008. Recognising that the timeline for advice had been extended, MFish took the opportunity to seek comment on the Aranovus research.

50 On December 14 2007 MFish notified some 900 stakeholders and iwi organisations that the Aranovus research was available for public comment (the report was also placed on MFish’s website). Due to an administrative error some stakeholders were not notified until December 20th 2007. Submissions closed on 21 January 2008.

Submissions received

51 MFish received 14 submissions on the Aranovus research.

a) Auckland Conservation Board (ACB)

b) Challenger Finfisheries Management Company Limited (Challenger)

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e) Egmont Seafood Limited (ESL)

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i) Nga Motu Marine Reserve Society Incorporated (Nga Motu)

j) Northern Fisheries Management Stakeholder Company Limited (NFMSCL)

k) Royal Forest and Bird Protection Society of New Zealand (F&B)

l) Sanford Limited (Sanford)

m) Seafood Industry Council (SeaFIC)

n) Venture Taranaki Trust (VTT)

Summary of position

52 **ACB** submits that the Aranovus report appears to be one sided and confined to the negative socio-economic impacts to fishers. ACB submits that the Aranovus report does not address the positive effects of reducing the commercial fishing inshore take.

53 **Challenger** submits that the report does not reflect the full economic impact that the measures proposed under the draft TMP would impose on the fishing industry. Challenger supported the submission made by SeaFIC.

54 ██████████ submits that the report does not meet minimum scientific standards, and is heavily biased.

55 ██████████ submits that the Aranovus report has some serious design problems. ██████████ identified the target audience addressed, the timing of the survey, the questions posed, the way these questions were presented and the way the data were analysed as particular problems.

56 **ESL** submits they are disappointed that the Aranovus report has only looked at the economic and social impacts to the fishers and has not attempted to quantify the impacts on the down stream individuals, businesses or communities which would be directly affected both economically and socially by the options in the draft TMP.

57 [REDACTED] submit that the impacts on the ECSI outlined in the Aranovus report seem to be consistent with what they would expect them to be on inshore fishers in boats 10 to 18 metres in length.

58 [REDACTED] submits he has never caught a dolphin in 35 years of fishing.

59 [REDACTED] submits that the Aranovus report does not include the benefits from increased marine protection and questions the independence of the report. [REDACTED] believes the survey questions were leading and emotive and these introduced bias into the report. [REDACTED] also believes that the report understates the impact of human activities upon the dolphins. [REDACTED] submits that the report is one-sided, and diminishes the international importance of this issue, and applies favour and bias to the fishing sector.

60 **Nga Motu** submits that if the level of economic loss detailed in the Aranovus report was regarded as the cost for avoiding species extinction, this could be achieved through compensation to affected fishers. Nga Motu submits that most of the respondents were recorded as being in their late forties or fifties and compensation may be a way to accelerate a change in fishing culture.

61 **NFMSCL** submits that, despite some issues, the Aranovus report confirms their view that the proposed options of the draft TMP will have significant socio-economic impacts on the commercial fishing industry. NFMSCL supported the submission made by SeaFIC.

62 **F&B** submits that the Aranovus report provides useful data and information on the nature and extent of fishing practises in areas that overlap with Hector's and Maui's dolphins plus the perceived impacts of options in the draft TMP on fishers but has many methodology limitations that need to be recognised.

63 **Sanford** submits that, despite some issues, the Aranovus report confirms their view that the proposed options of the draft TMP will have significant socio-economic impacts on the commercial fishing industry. Sanford supported the submission made by SeaFIC.

64 **SeaFIC** submits, despite the limitations placed on Aranovus, the report confirms the views forwarded by the fishing industry that the proposed options will have significant socio-economic impacts on the commercial fishing sector.

65 **VTT** submits that the findings of the Aranovus report demonstrates clearly the significance of the impact from any change in the management of fishing resources would have on the regional commercial fishing economy and the wider regional economy.

Statement of Impacts

66 **Challenger, ESL, NFMSCL, Sanford, SeaFIC and VTT** submits that the report significantly understates the impact of the measures not only at the aggregate national level but also at the fisher level.

67 **F&B** submits that the economic impact of the options in the draft TMP was assessed using total economic value or landed value, which both greatly exaggerates the true value of the fishery and does not reflect the cost of the draft TMP options.

68 **Challenger, ESL, NFMSCL, Sanford and SeaFIC** submits that the impact assessment should be based on the cost to the nation, not to the fisher. Accordingly, the prices used should be the export FOB (Free on Board) prices adjusted to a green-weight

price, not port prices.

69 [REDACTED] submits that a more accurate assessment of economic impact would have been to assess income not landed value.

Timeframe

70 **Challenger, ESL, F&B, NFMSCL, Sanford and SeaFIC** submits that Aranovus was not given enough time to produce a comprehensive assessment of the socio-economic impacts of the options in the draft TMP.

71 [REDACTED] submit that bias has been introduced into the Aranovus report as it was carried out at a time when passion was running high due to the release of the draft TMP. In this context fishers would be expected to give answers that exaggerate impacts not trivialise them.

72 **SeaFIC** submits it would have expected an impact assessment to have been completed prior to the release of the draft TMP.

Knowledge Restrictions

73 **Challenger, NFMSCL and Sanford** submits that it is unfortunate that the research provider chosen by MFish had limited knowledge and experience of the commercial fishing industry.

Independence

74 [REDACTED] submits that the Aranovus report is based solely on input from fishing industry and MFish.

75 [REDACTED] submits that the independence of the report should be questioned since it was commissioned by MFish and the methodology was not peer reviewed.

Lack of Validation

76 [REDACTED] and **F&B** submit that there has been no validation of what fishers said and no means by which the accuracy of the interviewee's claims could be checked.

Representation

77 **NFMSCL, Sanford and SeaFIC** submit that it is unclear how representative the data collected is and therefore how representative the Aranovus report findings are, and that this is acknowledged in the report. NFMSCL submits it is critical to determine representation to ensure that the correct amount of weighting is placed on the report when MFish is considering each option and the economic impacts.

Economic Benefit

78 **ACB, F&B and [REDACTED]** submit that the report does not take into account the economic benefits of better environmental protection such as increased tourism benefits, better recreational fisheries and reducing the pressure on inshore fisheries. [REDACTED] also submits that the report fails to account for the benefit of having both fisheries and dolphins' population in a good state for future generations to enjoy.

Qualitative Information versus Catch Loss Estimates

79 **SeaFIC** submits that there is a disjunction between the qualitative information received through the questionnaires and the catch loss estimates provided in the assessment. SeaFIC submits that Aranovus should have correlated the qualitative comments with its consideration of catch loss estimates.

Total Catch versus Affected Catch

80 **SeaFIC** submits that catch loss estimates appear to reflect the direct effects of the proposed draft TMP options on catch within the affected areas. They do not appear to reflect the wider effects that would be associated with the collapse of a fishing business.

Opinion versus Fact

81 [REDACTED] submits that the interview process was a survey of fishers' opinions only. He submits that these opinions are not data in any scientific sense and should not be treated as fact.

Self Reporting Bias

82 [REDACTED] **F&B and [REDACTED]** submit that the Aranovus methodology was designed to elicit emotions. They believe that the strongly felt views of fishers need to be qualified with the limitations of self-reporting and the bias that it introduces. The term "premature death" is sighted as an example of this.

Leading Questions

83 **F&B and [REDACTED]** submit that Aranovus asked leading and emotional questions to fishers and that this introduced unhelpful emotive bias into the report.

Double Counting

84 [REDACTED] **F&B and [REDACTED]** submit that some fishers could contribute their views more than once if they trawled and set net for fish. Also they could have been interviewed individually, contributed in the focus groups and filled in a survey form.

Data provided by the Ministry of Fisheries

85 [REDACTED] questions why the data provided by MFish was only up to the end of the 2005/2006 fishing year.

Cost of Switching Fishing Methods

86 [REDACTED], F&B and [REDACTED] submit that the Aranovus report assumes that when fishers are stopped from set netting, they would not switch to another fishing method. [REDACTED] submit this assumption is wrong and the key question that should have been asked is how much cost would there be in changing methods from gillnetting to something else.

Fishing Methods Limitations

87 **NFMSCL and Sanford** submit that the Aranovus report excludes the impacts of other methods of fishing such as Danish seine, purse seine, and mid water trawl which by definition would be included in the management options proposed in the draft TMP.

88 **SeaFIC** submits Aranovus assumed that the only trawl fishers affected in the South Island will be those using inshore bottom trawlers targeting flatfish. SeaFIC disagrees with this assumption as all trawl fishers whose fishing activities may be subject to the proposed options will potentially be affected.

Species Limitations

89 **ESL** submits that has Aranovus has excluded WAR8 from the tables calculating the economic value of set net catch for the WCNI. ESL submits that warehou is very important to Taranaki set net fisherman during the winter months and should have been included in the analysis.

90 **SeaFIC** submits that in the SCSi and WCSi regions additional species such as blue cod and stargazer are taken in significant quantities by inshore trawl fishers in the areas to be affected by the draft TMP and should have been included in the analysis.

Estimation Technique

91 **SeaFIC** submits it would like further explanation from Aranovus on how it estimated the catch loss estimates.

Use of the Agribusiness Report

92 **SeaFIC** submits it has significant doubts on the accuracy, reliability and robustness of that Agribusiness report and the cost structures developed. SeaFIC submits it would not have expected to see Aranovus use the output of the Agribusiness report in their review.

Lack of Definition or Accuracy

93 **SeaFIC** submits the Aranovus report provides data on the commercial catch levels in the WCNI, WCSi, ECSi and SCSi areas but it does not define those regions and whether they match the statistical areas used in the draft TMP. SeaFIC also submits it is difficult to ascertain from which source the assumptions, comments and conclusions in the report are derived.

Disclosure Standards

94 **SeaFIC** submits it is concerned by the lack of disclosure standards in respect of commercial details in the Aranovus report.

Missing Analysis

95 **Challenger, ESL, NFMSCL, Sanford, SeaFIC and VTT** submit that a full socio-economic impact assessment should include the impacts on quota owners, ACE holders, quota traders/brokers, licensed fish receivers, fish processors, fishing gear suppliers. They believe the current report does not cover all these groups.

96 [REDACTED] submit that Aranovus should have carried an economic impact assessment of areas where set netting restrictions are already in place, for example Akaroa.

97 **F&B and [REDACTED]** submits the Aranovus report should have assessed the impacts of the draft TMP options on all stakeholders, not just those in the fishing sector.

98 **SeaFIC** submits Aranovus collected information on the socio-economic impacts of the proposed options on the fishers but they did not attempt to identify, describe, summarise or interpret the results into a meaningful impact assessment. SeaFIC believes the Aranovus report fails to provide any meaningful value to consideration of the wider issues.

99 **VTT** submits that the executive summary is too long and does not include the main findings.

100 **VTT** submits that the analysis was undertaken at too high a level and should have focused on smaller geographical areas, for example Taranaki.

Inconsistencies

101 **F&B and [REDACTED]** submit that there are inconsistencies in the Aranovus report. The report states that 107 WCNI set netters are affected by the proposed options in the draft TMP while later in the report the number increases to 112 WCNI set netters.

102 **ESL** submit that the Option 2 presented at the Taranaki focus group meeting is different to that in the Aranovus report (pg. 92)

Compliance Issues

103 **F&B** submits that since ‘around 10% of fishers suggested that no change in their fishing practise would occur making their activity illegal’ (p.27); the draft TMP will need to provide a clear indication of how compliance and enforcement problems will be handled.

Compensation

104 **ACB and Nga Motu** submit that if the level of economic loss detailed in the Aranovus report were regarded as the cost for avoiding species extinction, this could be achieved through compensation to affected fishers or those fishers who wish to be bought out.

MINISTRY OF FISHERIES AD HOC WORKING GROUP TO REVIEW ARANOVUS METHODOLOGY

105 On February 4 2008 MFish held an ad hoc working group to review the Aranovus research and in particular the methodology used by Aranovus Research Ltd. The meeting was attended by fourteen stakeholders and representatives from a range of stakeholder organisations; including Sanford Ltd, SE Finfish, five MFish staff and two of the primary researchers from Aranovus Research Limited.

106 The working group was given as its purposes:

- a) to assess the process by which MFish commissioned the Aranovus research; and
- b) to assess the Aranovus research methodology.

107 MFish reviewed the written submissions on the Aranovus report prior to the meeting on 4 February. At the beginning of that meeting, MFish addressed two specific technical issues raised in the submissions.

- a) MFish agreed that port price was not an adequate measure of landed value and indicated that it would develop estimates of landed value that used export prices, port prices and other information (see paragraph 68).
- b) MFish agreed with comments that income is a better measure of economic impact than landed value and indicated that information on income multipliers from an input-output model would be used to derive income estimates from total revenues (see paragraph 69).

108 Comments by the *ad hoc* working group on the process by which the Aranovus research was integrated into the process of developing advice on the draft TMP included:

- a) There was strong support for re-establishing a permanent socioeconomic work group, rather than using *ad hoc* working groups.
- b) The short time frame for conduct of the work was criticised. That the research was conducted concurrently with the public consultation on the draft TMP was criticised.
- c) There was a wide-ranging discussion of the adequacy of data that MFish collects on fishing activity and economic returns from fishing. The lack of adequate data limits the ability of researchers to assess impacts of regulatory options.
- d) As reflected in submissions (paragraph 97), the process was criticised for not conducting socioeconomic research on stakeholders other than commercial and recreational harvesters.

109 The Aranovus research team presented a summary of their research methodology to the working group.

110 MFish asked the *ad hoc* working group to discuss the adequacy of the methodology in the Aranovus research. Many of the issues raised in this discussion were also covered in the written submissions.

- a) A major topic was whether the Aranovus research adequately reflected the ability of harvesters to reduce the impact of draft TMP restrictions by changing when, where, and how they fish.
- b) The adequacy of documentation on the qualitative assessment of impacts of draft TMP options, especially for impacts on trawlers (Aranovus, pp.69-75) and on set netters (Aranovus, Tables 12-15, pp. 87-91) was criticised.
- c) There was extensive discussion of about how successful were the Aranovus researchers in using the focus group methodology, in combination with secondary data, to distinguish the underlying facts from self-interested representations of facts.
- d) There was discussion of how best to estimate the potential loss of quota value under the draft TMP options.

111 In response to questions, MFish clarified that the working group was being asked to comment on a completed research project. This is unlike some MFish working group processes where preliminary research products are assessed by working groups.

112 MFish did not ask the working group to produce a consensus assessment of the Aranovus research. MFish did use both the written submissions and the *ad hoc* working group comments in its integration of the Aranovus research into its assessment of the likely impacts of the draft TMP.