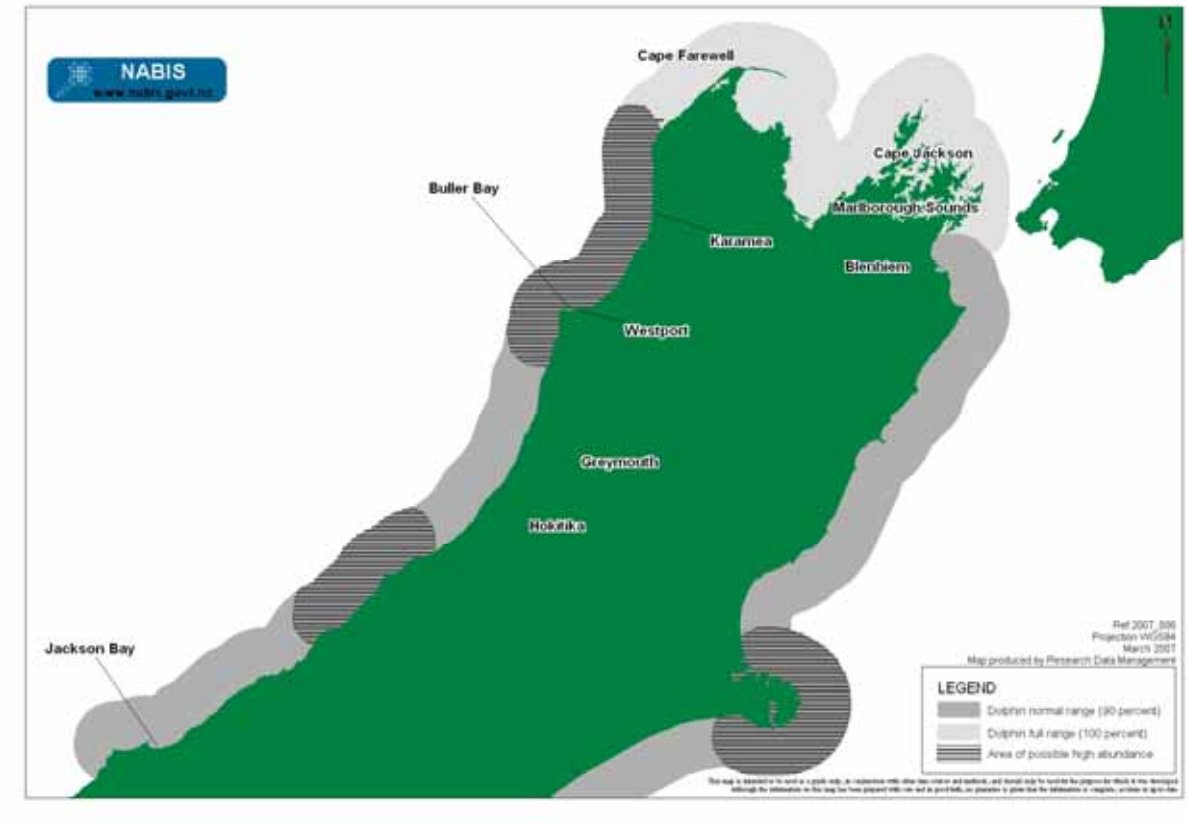
7.6. West Coast of the South Island

The West Coast South Island (WCSI) Hector's dolphin population extends between Cape Farewell in the north and Awarua Point in the south (just north of Fiordland). This area covers the southern part of Fisheries Management Area (FMA) 7 and includes Fisheries Statistical Areas 033, 034, 035, and 036. The WCSI population encompasses DOC's West Coast Conservancy.

All river mouths, estuaries, and lagoons are excluded from the WCSI proposals, as these areas are not part of Hector's dolphins range on the west coast.

7.6.1. Population characteristics

Hector's dolphins are present throughout the WCSI region but densities are higher in (i) Karamea to Punakaiki (including Buller Bay) (ii) Okarito Lagoon to Arnott Point and (iii) Neils Beach to Jacksons Bay (Map 19).



Map 19: Distribution of the WCSI Hector's dolphin population.

WCSI Hector's dolphins are most common in waters less than 20m deep and/or less than 2nm from shore (sightings outside 6nm are rare). They are regularly sighted within the surf zone during summer and are usually associated with murky waters around river mouths and estuaries. Hector's dolphins are not normally sighted in clearer offshore waters.

Based on observed movements of Hector's dolphins in other localities, it appears that individual dolphin groups are generally restricted to localised areas with little movement between areas. Seasonal offshore movement of individual dolphins along the WCSI is limited compared with the ECSI population (probably because the continental shelf drops away closer on the WCSI).

The WCSI population comprises about 5400 individuals[144] (95% confidence interval = 3613-8034), representing about 70% of the national species abundance. Groups typically include 4-6 animals but larger groups of up to 30-40 animals are relatively common in some places on the WCSI.

MFish cannot determine whether there have been changes in the WCSI Hector's dolphin population size over time because of the lack of comparative population surveys. However, genetic studies have not detected a decline in recent abundance.

7.6.2. Fishing threats

The WCSI Hector's dolphin population is susceptible to low levels of human-induced mortality. Population Biological Removal (PBR) analysis suggests 7 to 12 dolphins can be removed from the WCSI population each year (excluding natural mortalities)[145] without preventing the population increasing in size. PBR analysis using the Recovery Factor default value of 0.5 suggests that the population could sustain around 38 human-induced mortalities annually (not taking into consideration possible population fragmentation.)

As Hector's dolphins typically move only small distances over their lifetime, they are particularly susceptible to genetic fragmentation and this can affect the overall well-being of the WCSI population. Genetic fragmentation can occur when groups of dolphins are isolated throughout their range to such an extent that little mixing between groups occurs. Human-induced (non fishing-related and fishing-related) mortalities could exacerbate this threat. The main fishing threats to the WCSI Hector's dolphin population are set netting (amateur and commercial) and trawling (mid-water, bottom, and pair).

The DOC incident database lists 116 mortalities from the WCSI since 1988[146]. Of these reported mortalities, a cause of death was able to be assessed in 59 cases. Fishing activity is the identified cause of death in 29% of these cases (ie, 17 animals). There are another 23 mortalities that have been identified as "possible" or "probable" net entanglements. These incidents relate to carcasses that were not recovered from a net but where there is evidence of entanglement (for example, net marks). Definite human interaction with the dolphins was identified in 3 cases (5%) and in another 3 cases possible human interaction was identified. In 5 cases, the pathologist could not determine a cause of death. Of the remaining 57 cases, 13 were not assessed for cause of death, 26 animals were too decomposed or fragmented and the information is currently not available for 18 animals. Table 17 shows the number of cases where a definite cause of death was found.

[144] Based on stratified line transect aerial surveys over four periods since 1998 (Slooten *et. al.* 2004)

[145] When applying the Recovery Rate Goal; see Appendix 3 for a description of the PBR analysis for Hector's dolphins. PBR is only one of a number of factors in determining appropriate management action. There is currently debate around the inputs to the PBR analysis for Hector's dolphins, leading to a range of estimated potential removals. MFish and DOC propose to have the Hector's dolphin PBR analysis independently reviewed to resolve this issue.

[146] The DOC incident database lists Hector's dolphin mortalities reported to DOC. An unknown number of mortalities probably go unreported.

Table 17 Total number of reported Hector's dolphin mortalities in the West Coast Conservancy and their attributed cause of death (since 1988)

Cause of death	**Number**	**Percentage of reported deaths with confirmed cause**	**Percentage of total reported mortalities**
Known set net entanglement	13 (9 known recreational, 4 from unknown set net)	52% (36% recreational, 16% unknown)	11% (8% recreational, 3% unknown)
Known trawl bycatch	4 (2 incidents, each resulting in 2 mortalities)	16%	3%
Trauma (unknown source)	3	12%	3%
Natural	5	20%	4%

Fishers are required by law to report dolphin entanglement (Marine Mammal Protection Act 1978) but MFish knows that not all entanglements and mortalities are reported (the fishing-related mortalities in Table 17 are likely to be underestimates). For example, MFish has received reports of dead Hector's dolphins hidden in areas immediately above high tide in the Buller Bay area – presumably by fishers attempting to hide evidence of entanglement. As such, MFish cannot determine the actual extent of mortalities caused by fishing.

Most fishing-related dolphin mortalities on the WCSI occur between early spring and late summer. MFish cannot determine whether this incidence pattern is correlated with increased fishing activity *per se* or with a higher likelihood of people reporting beached carcasses during the warmer summer months. However, MFish believes it is reasonable to expect that fishing (particularly amateur set netting) outside the summer months poses a lower risk to dolphins because of lower effort and a decrease in number of Hector's dolphins very close to shore (including the surf zone).

7.6.2.1. Set nets

The vulnerability of Hector's dolphins to entanglement in fishing gear, particularly in inshore set nets, has been well established through a combination of interviews and autopsies of bycaught and beach-cast animals. Hector's dolphin has a close inshore distribution which results in an overlap with commercial and amateur set net fisheries, and Hector's dolphins are known to have been entangled in set nets throughout their range. Illegal set net practices (eg, staking set nets on the beach and nets set directly off the beach) increase the chance of dolphin entanglement. From the beach, amateur fishers generally position set nets 90° to the shore and into the surf zone where dolphins occur, particularly over summer.

On the WCSI, set nets are responsible for 52% of reported Hector's dolphin mortalities where the cause of death is known (13 animals) – see Table 17.

Amateur set nets

Low levels of amateur set netting occurs along the WCSI and this is largely due to the exposed nature of the inshore environment - seas are often rough for long periods of time that preclude fishers from using set nets. There are occasional long periods of calm weather, particularly during the summer, when fishers are able to use set nets to catch fish. Main target species are elephant fish, tarakihi, and rig. Most set netting occurs in close proximity to towns and settlements.

Anecdotal information suggests most amateur set netting along the WCSI is undertaken by visitors to the area during the summer months. The WCSI is becoming an increasingly popular holiday destination and

the number of fishers visiting the coast has increased (particularly in areas around Jacksons Bay, Granity, Hector). Visiting fishers will often take advantage of calm weather during summer and set nets regularly during their stay. Some local fishers suggest most amateur set netting problems (eg, net loss, excessive soak time) are due to visitors' unfamiliarity with local conditions (eg, nets placed in inappropriate locations or left at sea in rough weather). Most set nets are generally set directly from shore with few nets set from boats due to the exposed nature of the coast.

There is anecdotal information to suggest that some fishers illegally set nets due to either local sea conditions or because they perceive the risk of being caught is low. These nets are staked into the ground (often using railways sleepers permanently buried into the sand) and/or stranded at low tide. Often these nets are left to continuously fish over many days (including overnight).

On the WCSI, amateur set netting is the main known cause of reported Hector's dolphin mortality. Of the reported mortalities on the DOC incident database amateur set nets are responsible for at least 36% (9 animals) of cases where set nets were attributed as the cause of death. MFish cannot determine if the remaining 4 confirmed set net mortalities were caused by commercial or amateur set nets.

Commercial set nets

Commercial set netting on the WCSI overlaps with Hector's dolphin distribution. Fishers target rig and school shark but take other species in smaller quantities (eg, gurnard, moki, stargazer, and elephant fish).

Approximately 12 commercial set netters (operating about 12 vessels) fish on the WCSI. However, only 3 to 5 who target rig and school shark reside on the WCSI and restrict their fishing activities to local areas. The remaining fishers predominantly fish in Golden and Tasman Bays, but will fish along the northern WCSI when sea conditions are suitable.

Most rig catches (about 60%) in the regional target set net fishery come from Golden and Tasman Bays. Much of the remaining catch comes from Cape Foulwind to Awarua Point on the WCSI (ie, Statistical Reporting Areas 033 to 034). Most school shark catches (about 75%) in the regional target set net fishery come from northern Cape Foulwind to Cape Farewell area (ie, 035 and 036). Much of the remaining catch comes from Golden and Tasman Bays (038).

Most set netting for rig occurs within relatively shallow inshore waters, with catches mainly taken during spring and summer, and tapering off between March and August. School shark catches are usually taken in deeper waters, although some catches are taken close to shore in some areas. There appears to be little seasonality in target school shark set net catches although catches tend to be higher between January and April.

Table 18 below characterises the main commercial set net fisheries on the WCSI using estimated catch and effort data reported from statistical reporting areas 033, 034, 035, and 036 over the past three fishing years. Not all the catch and effort (and value) listed in Table 18 can be attributed to the WCSI area that overlaps with Hector's dolphins because the statistical reporting areas cover a much wider area. However, the characterisation illustrates the nature and extent of set netting on the WCSI and helps to assess potential costs to fishers of measures to avoid, remedy, and mitigate the adverse effects of fishing on Hector's dolphins (see later in section). Additional fishery characterization for selected WCSI fisheries is in Appendix 4.

Table 18 WCSI set net characterisation from estimated catch and effort reporting in statistical reporting areas 33, 34, 45, and 36. Value is estimated from the port price for the corresponding year[147].

Fishery		**2003-04**	**2004-05**	**2005-06**
School shark	Catch (tonne)	63	58	68
	Fishers	10	10	9
	Vessels	10	10	9
	Value ($)	$109,578	$111,650	$117,300
Rig	Catch (tonne)	40	39	59
	Fishers	10	10	8
	Vessels	10	10	8
	Value ($)	$118,400	$102,960	$156,350
Spiny dogfish	Catch (tonne)	1	4	10
	Fishers	2	3	3
	Vessels	2	3	3
	Value ($)	$498	$1,760	$4,700
Flatfish[148]	Catch (tonne)	0.6	0.2	0.7
	Fishers	6	5	5
	Vessels	6	5	6
	Value ($)	$1718	$626	$2279

There have been no confirmed Hector's dolphin mortalities in the commercial set net fishery off the WCSI. However, MFish considers commercial set netting is a threat to the population because nets are set in the same areas where Hector's dolphins occur and there are confirmed reports in other set net fisheries where commercial set nets have caught Hector's dolphins (ie, ECSI). MFish cannot determine whether the absence of reported dolphin entanglements on the WCSI reflects zero interactions between commercial set nets and dolphins or fisher non-reporting.

MFish notes there is uncertainty around cause of death in reported Hector's dolphin mortalities – the DOC incident database lists 4 set net mortalities not attributed to either amateur or commercial set nets. Commercial fishers may be responsible for some of these mortalities. In addition, the database includes 23 more mortalities where the cause of death is unknown but are "possible" and "probable" net entanglements, and some of these may be commercial set net related.

There has been no observer coverage of the WCSI commercial set net fishery and, as such, levels of bycatch cannot be quantified with certainty. Scientists have undertaken population modelling using data collected from the ECSI population (biological information and bycatch rates) and WCSI commercial set net effort data to estimate the impacts of commercial set netting on the WCSI Hector's dolphin population (the absence of data for other threats precludes their inclusion in the analysis). Some of this work indicates that the WCSI population will have a positive growth rate under current levels of

[147] Port prices are calculated by surveying Licensed Fish Receivers (LFRs) to see what they are paying for each species. Survey replies may be skewed because (i) industry know they are used to set cost recovery levies (ii) the survey does not differentiate harvest method – fish caught by one method over another may command a price premium (iii) ownership structure can influence port price and (iv) port price does not reflect price differential for different grades of fish.

[148] Includes all flatfish species codes.

commercial set net mortality[149]; whereas other studies indicate the WCSI population has declined and will continue to decline under *status quo* management[150]. The main reason for the differences in results is that the former study took into account the spatial dynamics of the WCSI commercial set net fishery (i.e. a more spatially realistic approach), which led to less overlap between commercial set net effort and Hector's dolphin distribution compared to other studies, which have taken a broader spatial scale approach. The contrasting results from these studies highlight the uncertainty around the impacts of commercial set netting on the WCSI population. MFish welcomes stakeholder submissions on this issue.

Customary set nets

MFish understands that no or very little customary fishing using set nets occurs along the WCSI. The DOC incident database lists no mortalities attributable to customary set net fishing on the WCSI. MFish believes the use of set nets for customary fishing on the WCSI poses a low risk to Hector's dolphins. MFish welcomes submissions from tangata whenua on this issue.

7.6.2.2. Commercial trawling (mid-water, bottom, and pair)

Commercial trawling is responsible for some reported Hector's dolphin mortalities on the WCSI. Of the reported mortalities listed in the DOC incident database at least 16% (4 animals) where the cause of death is known are attributed to trawling (see Table 17 above). These 4 mortalities occurred in 2 separate events in 1988; each resulting in the death of 2 Hector's dolphins.

There are approximately 50 trawl fishers operating about 57 vessels (under 46m) on the WCSI. These fishers catch a wide range of inshore fish species including red cod, barracouta, tarakihi, stargazer, flatfish, and red gurnard. Most fishers operating within inshore areas target barracouta in deeper waters typically 6nm+ from shore. Many of these same fishers also catch a wide range of other species inside 6nm at varying water depths including flatfish, red cod, tarakihi, stargazer, and elephant fish.

Trawling can occur relatively close to shore dependent on species targeted and water depth relative to shore. For example, flatfish is mainly targeted in water depths less than 30m (using low headline height fishing gear). Red cod is mainly targeted in water depths between 20 and 50m and tarakihi between 50 and 100m. Commercial vessels trawl throughout the WCSI but MFish cannot determine the precise location of individual trawl events using existing data – although much trawl effort is concentrated between Westport and Hokitika[151].

Table 19 below characterizes the main commercial trawl fisheries (vessels <46m) on the WCSI using estimated catch and effort data reported from statistical reporting areas 33, 34, 35, and 36 over the past three fishing years. Not all the catch and effort (and value) listed in Table 19 can be attributed to the WCSI area that overlaps with Hector's dolphins because the statistical reporting areas cover a much wider area. However, the characterization illustrates the nature and extent of trawling on the WCSI and helps to assess potential costs to fishers of measures to avoid, remedy, and mitigate the adverse effects of fishing on Hector's dolphins (see later in section).

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[149] Secchi, E. R. (2006). Modelling the population dynamics and viability analysis of the Franciscana (*Pontoporia blainvillei*) and Hector's dolphins (*Cephalorynchus hectori*) under the effects of bycatch in fisheries, parameter uncertainty and stochasticity. PhD thesis, University of Otago.

[150] For example, Slooten, E. (2007). Conservation management in the face of uncertainty: Effectiveness of four options for managing Hector's dolphin bycatch. *Endangered Species Research*: 3, pp 169-179.

[151] WCSI inshore trawl fisheries are managed as part of the wider Fisheries Management Area 7 (FMA 7) that includes the top of the South Island and WCSI, but fishers report estimated catches by finer scale Statistical Reporting Areas.

Table 19 WCSI trawl characterisation captured from estimated catch and effort reporting in statistical reporting areas 33, 34, 45, and 36. Value is estimated from the port price for the corresponding year[152]. Analysis excludes vessels >46m except for * that may include vessels greater than 46m

Fishery		**2003-04**	**2004-05**	**2005-06**
Red cod	Catch (tonne)	1067	1899	1690
	Fishers	53	44	46
	Vessels	63	50	51
	Value ($)	$659,574	$1,130,200	$1,013,711
Barracouta	Catch (tonne)	845	884	648
	Fishers	41	35	30
	Vessels	52	35	34
	Value ($)	$354,033	$247,426	$187,936
Tarakihi	Catch (tonne)	594	574	675
	Fishers	38	30	28
	Vessels	45	36	31
	Value ($)	$1,164,403	$995,717	$1,333,960
Stargazer	Catch (tonne)	354	437	436
	Fishers	33	40	37
	Vessels	38	34	30
	Value ($)	$460,615	$465,748	$472,924
Warehou	Catch (tonne)	422	401	359
	Fishers	32	29	25
	Vessels	38	32	28
	Value ($)	N/A	N/A	N/A
Red Gurnard	Catch (tonne)	406	423	322
	Fishers	55	46	47
	Vessels	64	53	53
	Value ($)	$585,850	$613,982	$451,102
Flatfish	Catch (tonne)	389	505	572
	Fishers	50	43	43
	Vessels	61	50	48
	Value ($)	$1,112,913	$1,580,060	$1,862,334
Spiny dogfish	Catch (tonne)	112	148	112

[152] Port prices are calculated by surveying Licensed Fish Receivers (LFRs) to see what they are paying for each species. Survey replies may be skewed because (i) industry know they are used to set cost recovery levies (ii) the survey does not differentiate harvest method – fish caught by one method over another may command a price premium (iii) ownership structure can influence port price and (iv) port price does not reflect price differential for different grades of fish.

Fishery		2003-04	2004-05	2005-06
	Fishers	15	14	17
	Vessels	21	15	21
	Value ($)	$55,626	$65,209	$52,694
School shark*	Catch (tonne)	47	40	36
	Fishers	40	34	31
	Vessels	49	38	36
	Value ($)	$81,883	$77,000	$62,100
John dory	Catch (tonne)	35	37	40
	Fishers	27	19	22
	Vessels	31	22	22
	Value ($)	$133,295	$146,175	$158,485
Snapper	Catch (tonne)	25	35	27
	Fishers	28	25	21
	Vessels	34	30	24
	Value ($)	$98,539	$133,536	$94,343
Trevally	Catch (tonne)	24	28	26
	Fishers	16	16	17
	Vessels	20	20	18
	Value ($)	$15,979	$25,271	$22,310
Rig	Catch (tonne)	16	21	30
	Fishers	42	36	35
	Vessels	51	39	40
	Value ($)	$48,296	$54,367	$79,656
Elephant fish	Catch (tonne)	6	22	20
	Fishers	29	28	31
	Vessels	31	33	34
	Value ($)	$13,419	$30,250	$28,200
Sea perch*	Catch (tonne)	12	7	11
	Fishers	18	18	14
	Vessels	25	22	24
	Value ($)	$10,200	$5,110	$6,600

Despite the lack of recent reported trawling-related mortalities, MFish considers there remains the potential for trawling/dolphin interactions because commercial trawling occurs inside 6nm. MFish relies on fishers to report dolphin interactions because Fisheries Observer coverage in the inshore WCSI trawl fishery is very limited – it is possible that some interactions are not reported.

Anecdotal information indicates inshore trawl fishers regularly see Hector's dolphins when setting and retrieving trawl gear on the WCSI. These fishers consider their activities do not pose a risk to dolphins because of the type of net they use (low headline nets (<1m high), no wing doors, smaller sweep area),

together with low tow speed (4-6kn) that enable dolphins to easily swim away from an approaching net. Some fishers consider their nets do not catch dolphins as MFish would have received reports of trawl-related dolphin mortalities given the very extensive trawling effort along the west coast in the past 20 years.

7.6.3. Existing threat management – status quo

There are no specific legislative or regulatory measures on the WCSI to avoid, remedy, or mitigate the effects of fishing on Hector's dolphins. However, nationally applicable set net regulations may help reduce the chance of fishing-dolphin interactions. In addition, there are voluntary mechanisms that apply to non commercial and commercial set netters on the WCSI that may also reduce the likelihood of interactions.

7.6.3.1. Set Nets

Amateur set nets

Regulations that apply nationally to amateur set netting may help reduce the chance of Hector's dolphin entanglement. The following amateur set net rules apply throughout New Zealand:

⇒Amateur nets must not exceed 60m in length[153]

⇒The use of stakes to secure amateur nets is prohibited[154]

⇒Amateur set nets must not be set in a way that causes fish to be stranded by the falling tide[155]

⇒Amateur nets must not be set within 60m of another net[156]

MFish promotes a voluntary set net code of practice (CoP) for amateur fishers on the WCSI to reduce the likelihood of Hector's dolphin entanglements. The code encourages good set netting practices, including:

⇒Using a net designed for the fish species being targeted

⇒Deploying a net with anchors that are suitable for sea conditions to prevent losing nets

⇒Setting a net that can be easily retrieved

⇒Staying with and regularly checking the net

⇒Avoiding setting nets when Hector's dolphins are present

⇒Deploying a net for the shortest soak time possible

⇒Avoiding setting nets overnight

Commercial set nets

Regulations that apply nationally to commercial set netting may help reduce the chance of Hector's dolphin entanglement. These measures include:

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[153] r 12(1)(a) of the Fisheries (Amateur Fishing) Regulations 1986
[154] r 11 of the Fisheries (Amateur Fishing) Regulations 1986
[155] r 10 of the Fisheries (Amateur Fishing) Regulations 1986
[156] r 12(1)(c) of the Fisheries (Amateur Fishing) Regulations 1986

⇒Commercial fishers cannot use more than 3000m of net per day[157]

⇒Commercial fishers must service their net while it is set at least every 24 hours[158]

The Challenger Finfisheries Management Company Limited (CFMC) has developed a voluntary set net CoP for all commercial set net fishers represented by the Company[159]. The CoP in FMA 7 and encourages set net fishers to implement practices that minimise interactions with Hector's dolphins. These practices include:

⇒Avoid setting nets in shallow estuaries, harbours and river mouths when water is cloudy or discoloured

⇒Avoid setting nets when Hector's dolphins are around and maintaining a lookout when gear is deployed

⇒Encourage the use of acoustic pingers on nets

⇒Keep set net duration to a minimum

⇒Set nets as tight as possible

⇒Recover nets as quickly as possible.

7.6.3.2. Commercial trawling (mid-water trawling, bottom trawling, and pair trawling)

There are no specific legislative, regulatory, or voluntary management measures to avoid, remedy, or mitigate the effects of trawling on Hector's dolphins on the WCSI.

7.6.4. Additional threat management

This section of the consultation document considers whether additional threat management is necessary to manage the effects of fishing on WCSI Hector's dolphin population by:

⇒Discussing the effectiveness of current threat management; and

⇒Relevant considerations for the Minister when determining whether measures are necessary to avoid, remedy or mitigate the effects of fishing on the WCSI population.

7.6.4.1. Effectiveness of current threat management

Amateur set nets

Hector's dolphin entanglements in amateur set nets continue to occur on the WCSI under existing set net regulations and voluntary CoP measures.

MFish has direct evidence of 9 Hector's dolphin mortalities caused by amateur set nets since 1988.

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[157] r 65(3) of the Fisheries (Commercial Fishing) Regulations 1986
[158] r 2BB of the Fisheries (Challenger Area Commercial Fishing) Regulations 1986
[159] CFMC is the regional commercial stakeholder organisation for Fisheries Management Areas (FMA) 7 and 8. FMA 7 (WCSI, Tasman Bay, Golden Bay, and the Marlborough Sounds) encompasses the WCSI Hector's dolphin population.

MFish is unable to effectively monitor amateur set netting and therefore cannot determine if these mortalities reflect non-compliance with regulatory and voluntary measures, or whether the mortalities occur despite existing measures.

Commercial set nets

MFish cannot determine if existing regulatory and voluntary measures are effective at avoiding, remedying, or mitigating Hector's dolphin mortalities from commercial set netting on the WCSI. MFish does not monitor or assess effectiveness of these measures or monitor compliance with these measures.

There have been no confirmed Hector's dolphin mortalities caused by commercial set nets on the WCSI since 1988. The absence of reports may be due to the effectiveness of existing mandatory and voluntary measures, the failure of fishers to report dolphin entanglements, and an inability to determine cause of death.

MFish considers risk to Hector's dolphins from commercial set net activity exists because:

⇒There are 4 known set net mortalities since 1988 that cannot be attributed to amateur or commercial fishers

⇒Commercial set nets are set in the same areas where Hector's dolphins occur on the WCSI and

⇒There are confirmed reports from other localities that commercial set nets have caught Hector's dolphins (eg, ECSI).

Commercial trawling (mid-water trawling, bottom trawling, and pair trawling).

MFish considers there is a risk of Hector's dolphin entanglement in the WCSI trawl fishery (there are no measures in place to manage this risk). The DOC incident database lists 4 trawling-related Hector's dolphin mortalities on the WCSI (in 1988) and there is more recent evidence of trawl-related mortalities in the ECSI inshore trawl fishery (see ECSI section).

The absence of more recent reports from the WCSI, despite extensive trawling effort, may signal a comparatively low risk of inshore trawl fishing on the population (*cf* set nets) or a failure by fishers to report any dolphin interactions.

However, there has been some limited coverage of the WCSI inshore trawl fishery in the current fishing year (2007-07). Ninety tows have been observed with no Hector's dolphins observed caught.

Low levels of Fisheries Observer coverage in the WCSI trawl fishery means MFish cannot determine the actual extent of trawl-related mortalities.

7.6.4.2. Need and scope for additional threat management

Whether the Minister considers it necessary to implement further measures to manage the effects of fishing related mortality on Hector's dolphins depends ultimately on the balance between sustainability and utilization the Minister considers appropriate. MFish considers that the following are relevant to the Minister's considerations:

⇒Hector's dolphin is a threatened species.

⇒The WCSI population is the largest Hector's dolphin population in New Zealand.

⇒PBR analysis indicates that the WCSI population can withstand 7-12 human-induced mortalities

per year and still increase in size, while the current abundance of around 5400 individuals could be maintained at mortality levels closer to 38 animals per year when applying the recovery factor default value of 0.5 and not taking into consideration possible population fragmentation

⇒There is no genetic evidence of a recent decline in abundance

⇒Fishing is the most significant known threat facing Hector's dolphins on the WCSI (being attributable to 86% of all Hector's dolphin mortalities with a confirmed cause since 1988)

⇒Set netting has caused around 52% of the dolphin deaths on the WCSI since 1988 where cause of death can be determined

⇒Trawling poses a risk to dolphins but existing information suggests there is a low probability of interaction

⇒An unquantified number of fishing-related mortalities go unreported

⇒The genetic continuity (and overall wellbeing) of the population may be susceptible to fishing impacts (through localised depletion) and

⇒The effectiveness of current measures is uncertain but there is evidence that fishing-related Hector's dolphin mortalities are continuing under the current regulatory and voluntary measures.

The WCSI Hector's dolphin population is the biggest of all of the populations. Total number of recorded mortalities which can be directly attributed to fishing are 17 since 1988. However, this information is uncertain due to lack of observer coverage of commercial fishing activity and lack of incentives to report dolphin mortalities from commercial and non-commercial fishing.

The effect on the population of fishing related mortality is probably the lowest of all of the Hector's dolphin populations given the size of the WCSI population. Based on population size, and level of recorded information on impacts of fishing, the need for action to reduce fishing-related mortality immediately is less for the WCSI population than for other Hector's dolphin populations. However, there is considerable uncertainty in information on population status and trends. There is no scientific information to indicate whether the WCSI population is increasing, maintaining current population size, or decreasing.

Despite uncertainty in information on nature and extent of known risks, and the effect of those risks on the population and subsequently the species as a whole, MFish consider the Minister could take action to avoid, remedy or mitigate the effects of fishing-related mortality if he considered it necessary. Such action could be taken having regard to:

⇒Uncertainty in information on the nature and extent of impacts of fishing on the population linked to the ability to manage past, present and future effects of fishing meaning the Minister could be cautious to prevent impacts of fishing causing or exacerbating any current or future decline in the population (and consequently the species overall)

⇒A desire to reduce fishing-related mortality as far as possible to maximise potential for the WCSI population to contribute to an increase in the numbers of Hector's dolphins overall

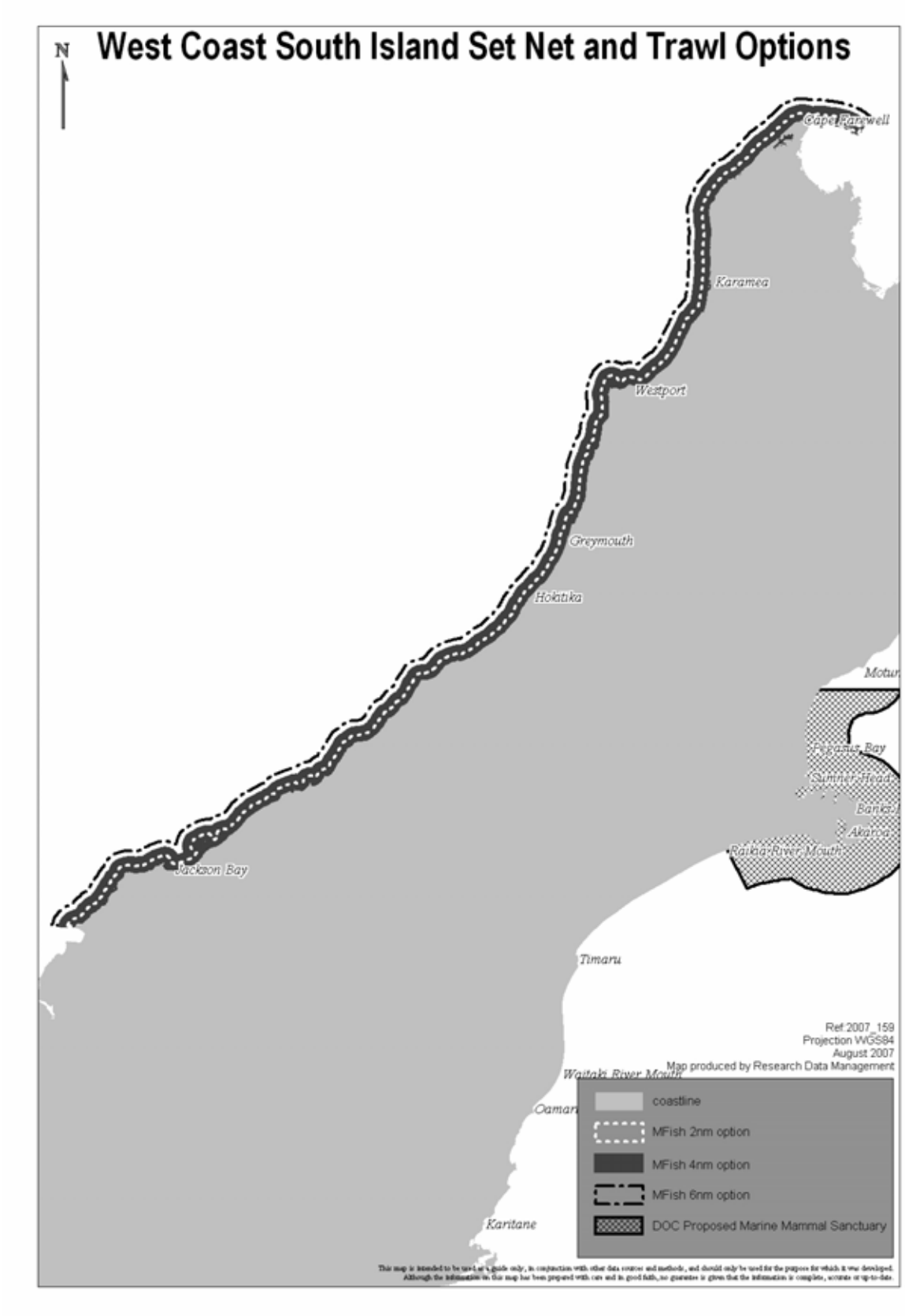
⇒Societal values which would suggest human-induced mortalities (including fishing-related mortality) should be reduced as far as possible.

However, MFish notes that FA96 does not oblige the Minister to take management action in relation to Hector's dolphins on the WCSI given the factors noted above. Need for action in relation to the WCSI population is at the discretion of the Minister having regard to the balance between sustainability and

utilisation he considers appropriate for this population and/or the species overall.

7.6.5. Options

This section outlines options to manage the effects of fishing on the WCSI Hector's dolphin population, if the Minister deems it necessary. Implicit in the Minister's decision is a careful consideration of the balance between sustainability and utilisation. Some options give more weight to sustainability relative to use. In considering the options the Minister should have regard to the information discussed above which outlines the nature of the effects of fishing-related mortality on the population, uncertainty in information, and basis for considering management action. The Minister should weigh up those factors and consider effectiveness and cost of measures when determining whether or not additional measures are necessary and what, if any measures should be implemented. Measures proposed for the WCSI are illustrated in Map 20.



Map 20 Measures proposed for WCSI

7.6.5.1. Status quo

The nature and extent of fishing threats to the WCSI population, and an analysis of effectiveness of current measures and consideration of the need for further measures have been outlined in the sections above. In light of this information, the Minister may consider that the risks of fishing-related mortality are acceptable and consequently further measures to avoid, remedy or mitigate the effects of fishing-related mortality on the WCSI population are not necessary. MFish notes that the *status quo* remains a valid option given uncertainty over the nature and extent of the impact of fishing-related mortality on Hector's dolphins and the impact of proposed measures on fisheries users. An analysis of the *status quo* has been presented above. No further analysis of the *status quo* is carried out in this option section.

7.6.5.2. Set netting

MFish proposes the following three options to manage the threats of amateur and commercial set netting on the WCSI population. The proposals are in addition to existing regulatory and voluntary measures and do not apply to river mouths, estuaries, and lagoons.

Status Quo – Existing management	
Option 1 – Implement mandatory and voluntary threat management measures inside 6nm from shore (MHW) between Cape Farewell and Awarua Point	
Amateur set netting	
Mandatory measures	Mandatory attendance with a set net; Maximum of one set net per person and per boat; No overnight setting of nets (between one hour before sunset to one hour after sunrise); and Maximum net length of 30m (fishers are permitted to use a net that has a maximum length of 60m when targeting flatfish within estuaries)
Voluntary measures	Hand in unused or unwanted nets to MFish
Commercial set netting	
Voluntary measures	Adherence to the existing voluntary set net code of practice
Mandatory measures	Additional monitoring of set netting

Option 2 – Amateur and commercial set netting is prohibited inside 2nm or 4nm from shore between Cape Farewell and Awarua Point with provision for some amateur set netting for 6 or 9 months. All sub-options have the additional set net measures as per Option 1		
Either:	**Option 2(A)**	Set net prohibition applies inside 2nm from shore – this option includes the following three alternatives: Prohibition applies all year round with set netting allowed for nine months of the year (1 March to 30 November) or Prohibition applies all year round with set netting allowed for six months of the year (1 April to 30 September) or Prohibition applies all year round
Or:	**Option 2(B)**	Set net prohibition applies inside 4nm from shore – this option includes the following three alternatives: Prohibition applies all year round with set netting allowed for nine months of the year (1 March to 30 November) or Prohibition applies all year round with set netting allowed for six months of the year (1 April to 30 September) or Prohibition applies all year round
Option 3 – All amateur and commercial set netting is prohibited inside 6nm between Cape Farewell and Awarua Point		

Analysis of amateur set netting options

Option 1

Existing amateur set net restrictions and code of practice measures will continue to apply with the addition of the following new mandatory requirements:

⇒Attendance with a set net;

⇒Maximum of one set net per person and boat;

⇒No overnight setting of nets (between one hour before sunset to one hour after sunrise); and

⇒Maximum net length of 30m (fishers will be permitted to use a net that has a maximum length of 60m when targeting flatfish in estuaries).

♦ *Effectiveness*

Option 1 will reduce the number and length of nets used at any one time and, therefore, lower risk of fishing-related mortality to Hector's dolphins by:

⇒Discouraging fishers from using set nets in preference for other fishing methods (MFish Compliance report that mandatory net attendance at Kaikoura during last summer produced a

notable decline in amateur set net usage)

⇒Reducing set net soak time (fishers will not be able to leave their set net)

⇒Enabling fishers to immediately remove their set net from the water if a dolphin appears in the vicinity, and enable fishers to attempt to release any net entangled dolphin.

Prohibitions on overnight setting will further reduce the risk of net entanglement.

MFish invites recreational fishers to hand in any unused or unwanted amateur set nets to remove latent effort in the amateur set net fishery. MFish could reward fishers who hand in nets with t-shirts, posters, school donations, etc.

Option 1 will leave residual risk because placement of nets within the water will still pose a threat to Hector's dolphins. However, MFish considers that overall risk reduces under Option 1.

♦ *Impacts on fishers*

Option 1 removes flexibility in the exercise amateur fishing activity. Option 1 will enable amateur fishers to continue to use set nets to target important recreational species, but limitations on fishing activity proposed in Option 1 may impact the amateur fishing experience, effort, and daily catch. For example, some amateur fishers set nets then move on to set additional nets or line fish in another area. Requirements to stay with nets will effectively prevent this activity.

MFish considers that lower overall recreational effort and catch is the most likely outcome even though Option 1 provides for greatest amateur set netting use along the WCSI in comparison with Options 2 and 3.

Option 2

Option 2 proposes to prohibit amateur set netting inside 2nm (Option 2A) or 4nm (Option 2B) between Cape Farewell and Awarua Point for a 12 month, 6 month, or 3 month period. Option 2 will give greater certainty of mitigating the risk of set nets to Hector's dolphins and is appropriate if the Minister considers residual risk in Option 1 (ie, ability to place set nets in the water) is too high.

♦ *Effectiveness*

The best available information suggests the WCSI Hector's dolphin population is restricted to 4-6nm from shore (and less than 100m depth), with the majority of dolphins found within 2nm or less than 20m depth. Hector's dolphins are regularly seen within the surf zone in many areas during summer. An amateur set net prohibition out to 2nm effectively encompasses waters out to about 15-20m deep in many areas and will protect a significant proportion of the population from the threat of set nets. Option 2B gives additional certainty that amateur set nets will not overlap with Hector's dolphin distribution. MFish understands that Hector's dolphins along the WCSI generally remain close to shore throughout the year, with little offshore movement during the colder winter months. As such, MFish believes there is little reason to alternate the closed areas between 2nm and 4nm between seasons to reflect seasonal movements of dolphins.

MFish understands the majority of amateur set netting occurs in summer when visitor numbers to the WCSI increases and recreational fishing effort increases accordingly. It is also during the summer period when the sea can be relatively calm for extended periods and conditions are more suitable for amateur set netting. MFish believes the greatest risk of dolphin entanglement by amateur set nets is in summer by virtue of highest amateur set net activity being largely undertaken by non-local fishers not familiar with local weather and sea conditions. A seasonal closure for the WCSI may significantly reduce the risk of

set net entanglement and allow some restricted set netting (ie, mandatory net attendance, no overnight fishing, etc) during all other times of the year when the risk of dolphin entanglement is much lower.

- *Impacts on fishers*

The proposed 2nm set net closure will effectively prohibit all amateur set netting on the WCSI. This is because most amateur fishers set their nets either directly from or very close to shore due to the exposed nature of the coast. MFish considers there is little merit in extending the closure out to 4nm as fishers are unlikely to travel further than 2nm miles from shore to set a single net given the risks associated with travelling significant distances from shore on the WCSI, together with the proposed requirement to stay with their net.

Restricting the proposed set net closure to 3 or 6 months (to coincide with the summer period) will mitigate impacts on some local recreational fishers who will still be able to set nets outside summer. MFish invites submissions from fishers that discuss the utilisation impacts of Option 2.

Option 3

Option 3 imposes a total prohibition on all set netting in all waters inside 6nm from shore.

- *Effectiveness*

Option 3 is the most risk averse option and is appropriate if the Minister considers it necessary to avoid interactions (with a very high level of certainty) between amateur set nets and Hector's dolphins (sightings of WCSI Hector's dolphins outside 6nm are rare). However, the majority of the population is found in waters less than 2nm from shore with only a few animals venturing out to 6nm such that the benefits of a 6nm closure (compared to less onerous options in Option 2) are marginal.

- *Impacts on fishers*

Option 3 is unlikely to prevent utilisation beyond the more onerous options in Option 2 - nearly all recreational fishers set their nets directly from, or very close to, the shore.

Analysis of commercial set netting options

Option 1

Option 1 requires commercial set net fishers to demonstrate adherence to the CFMC set net CoP inside 6nm from shore (MHW) between Cape Farewell and Awarua Point. Option 1 also requires a level of set net monitoring commensurate with residual risk to dolphins after application of the CoP. Part of this monitoring programme should revolve around CoP compliance monitoring.

- *Effectiveness*

Allowing set nets in areas and at times of the year where dolphins are usually present constitutes a greater, albeit unquantified, risk of fishing-related mortality than excluding set nets within parts, or the whole, of the dolphins range (ie. Options 2 and 3). Option 1 accepts that commercial set netting on the WCSI under the existing management arrangement poses an acceptable risk to Hector's dolphins.

MFish also notes that, because this option is the least risk averse, fishery monitoring would also provide additional certainty that CoP measures mitigate potential effects on Hector's dolphins. Low levels of observer coverage of the commercial set net fishery make it difficult to determine the success of industry's initiatives to mitigate Hector's dolphin mortalities, and therefore to assess the current level of risk to Hector's dolphins on the WCSI under *status quo* management.

- *Impacts on fishers*

Fine-scale set net distribution information available since 2006 (but not shown here) shows that most shark set netting occurs inside 6nm on the WCSI. There are approximately 12 set net vessels operating in the area covered by the SCSI Hector's dolphin section that may need to adopt monitoring under Option 1 (or elect to fish outside the area covered by the monitoring proposal). Fisheries Observers typically cost $800 to $1000 per day, and electronic monitoring equipment around $10,000 to install, such that total monitoring costs could potentially be expensive.

MFish believes Option 1 would only be a reasonable course of action providing there is sufficient certainty that all fishers comply with the existing CoP. MFish invites the industry to submit information on the current level of compliance with the code including ways to measure the level of compliance and what actions could be taken on individual fishers who do not comply with specific measures. MFish considers there is also a need for independent verification that fishers comply with the CoP, including the placement of fisheries observers and/or monitoring equipment on set net vessels fishing within the dolphins' range.

MFish invites submissions from fishers that discuss the utilization impacts of Option 1.

Option 2

Option 2 proposes to prohibit commercial set netting inside 2nm (Option 2A) or 4nm (Option 2B) between Cape Farewell and Awarua Point for a 12 month, 6 month, or 3 month period. Option 2 will give greater certainty of mitigating the risk of commercial set nets to Hector's dolphins and is appropriate if the Minister considers residual risk in Option 1 (ie, ability to place nets in the water) is too high.

- *Effectiveness*

The best available information suggests the WCSI Hector's dolphin population is restricted to 4-6nm from shore (and less than 100m depth), with the majority of dolphins found within 2nm or less than 20m depth. Prohibiting set netting within 2nm from shore effectively encompasses waters out to about 15-20m water depth in many areas and will protect a significant proportion of the population from the threat of set nets; this protection is further increased if the closure extends out to 4nm.

Measures proposed under Option 2 will largely prohibit the summer rig and school shark fisheries from the inshore area of the WCSI. When the fisheries are permitted, risk to Hector's dolphins will be managed by the CoP and additional fishery monitoring.

- *Impacts on fishers*

The proposed set net closures will have a significant impact on the commercial rig and school shark set net fisheries. Presently commercial fishers target rig and school shark on the WCSI across a range of water depths ranging from 5m out to 50m. The degree of impact will be less if the closure applies to 2nm from shore.

The majority of rig and school shark catches caught on the WCSI are taken by 3-5 resident commercial fishers based around the three main ports (Westport, Greymouth and Hokitika). These fishers generally operate small vessels (less than 13-15m in length) and carry up to 3-4 crew. These fishers generally operate in areas close to port on a 1-3 day basis, but some can fish further afield for up to 5-6 days. Most fishers target rig and school shark from their home port to maximise fishing efficiency (ie, reduce travel time, fuel and crew costs to a minimum). Several fishers from the top of the South Island also target rig and school shark on the WCSI and mainly restrict their activities to more northern areas (ie, around Cape Farewell). The economic return of the rig fishery has decreased in recent years as a direct result of a reduction in the SPO 7 TACC (ie, reduced from 350 tonnes to 221 tonnes at the start of the 2006-07

fishing year), as well as a voluntary quota shelving arrangement in response to concerns about overfishing.

In the last three fishing years (2003-04 to 2005-06), the set net rig fishery had an annual 'gross' value of about $118 400, $102, 960, and $156 350. For the same period, the set net school shark fishery had an annual 'gross' value of about $109 578, $111 650, and $117 300. MFish is unable to further quantify the economic impact of the proposed 2nm (Option 2A) and 4nm (Option 2B) set net closures on the rig and school shark fisheries without more information. MFish invites industry to provide information to better assess this impact. However, MFish believes these impacts will be lower if the closure applies to 2nm only, as fishers will still continue to catch rig and school shark within their local waters further offshore. Individual fisher set net positions have only become recently available and these clearly suggest that rig and school shark catches occur across a wide depth range with a significant proportion outside the proposed 2nm closure. This indicates that fishers have vessels that are capable of fishing offshore. As such, the proposed 2nm closure will impact on local fishers, but fishers will still be able to catch rig and school shark by moving further offshore.

MFish notes the proposed 4nm closure will have a bigger impact on local fishers and this may require them to significantly modify their fishing operations (including possibly acquiring a larger vessel) to continue to catch rig and school shark. MFish accepts there will be economic implications under the proposed closures as fishing costs will be higher as fishers will have to move away from existing fishing grounds. These impacts will be higher under the option of extending the closure out to 4nm.

MFish expects that set net effort would shift closer to Golden Bay as WCSI set net prohibitions became more extensive (ie, 2nm to 4nm). The target school shark fishery would probably be affected more by Option 2 because a greater proportion of the fishery is caught on the WCSI (although fishers can target school shark outside 4nm on the WCSI in deeper water than in rig fishery).

The implications of the proposed commercial set net closures could be further mitigated if the restrictions applied over the summer months only. As school shark catches are generally taken throughout the year (although they tend to peak between January and April), a closure over the summer months would have a lower impact on the school shark fishery. However, the impacts would remain unchanged on the rig fishery, as most catches are generally taken during spring and summer. The benefits of implementing a seasonal closure are largely negated due to the presence of Hector's dolphins in inshore areas throughout the year, and therefore the risk of dolphin entanglement would remain.

The proposed set net closures will have no or very little impact on the set net ling fishery that occurs in waters more than 100m depth. This fishery occurs in areas well away from the Hector's dolphin range. Fishers will still be able to set net for ling under Options 2A and 2B.

MFish invites submissions from fishers that discuss the utilisation impacts of Option 2.

Option 3

Option 3 imposes a total net prohibition on all set netting in all waters inside 6nm from shore between Cape Farewell and Awarua Point.

- *Effectiveness*

This option provides the greatest protection to the WCSI population as all Hector's dolphins are found in waters less than 6nm from shore. This option would effectively eliminate the threat of Hector's dolphin entanglement with commercial set nets. However, the majority of the population is found in waters less than 2nm from shore with only a few animals venturing out to 6nm. As such, the benefits of a 6nm closure when compared to the proposed year round closure (sub-option iii) under Option 2 are marginal.

♦ *Impacts on fishers*

A proposed 6nm closure would effectively prohibit most, if not all commercial set net fishing for rig and school shark along the WCSI. These fisheries are generally found in waters less than 6nm and the proposed closure would have significant economic implications on affected fishers. While the risk of commercial set nets on Hector's dolphins would be eliminated (providing compliance is adequate) under this option, the impacts on the industry would be substantial. MFish expects that set net effort would significantly increase in Golden Bay as WCSI set net measures became prohibitive.

MFish is unable to quantify the economic impact of the proposed 6nm closure on these fisheries but considers the following points are important:

⇒Majority of rig and school shark catches caught on the WCSI are taken by 3-5 resident commercial fishers based around the three main ports (Westport, Greymouth and Hokitika). These fishers generally operate small vessels (less than 13-15m in length) and carry up to 3-4 crew. These fishers generally operate in areas close to port on a 1-3 day basis, but some can fish further afield for up to 5-6 days. Most fishers target rig and school shark from their home port to maximise fishing efficiency (ie, reduce travel time, fuel and crew costs to a minimum).

⇒The economic return of the rig fishery has decreased in recent years as a direct result of a reduction in the SPO 7 TACC (ie, reduced from 350 tonnes to 221 tonnes at the start of the 2006-07 fishing year), as well as a voluntary quota shelving arrangement in response to concerns about overfishing.

MFish does not know the extent to which Option 3 will impact on local support businesses (eg, Licensed Fish Receivers) and invites comments.

The Minister should consider whether the marginal benefits in Option 3 outweigh the economic costs when compared with Option 2. MFish invites industry to provide information to better assess this impact.

7.6.5.3. Commercial inshore trawling

MFish proposes the following options to manage the threats of trawl fishing on the WCSI population as follows. The proposed options apply to mid-water, bottom, and pair trawl as defined in regulation 3 of the Fisheries (Commercial Fishing) Regulations 2001.

Status Quo – Existing management
Option 1 – Develop and implement a voluntary code of practice and additional monitoring of trawling inside 6nm from shore (MHW) between Cape Farewell and Awarua Point
Option 2 - All trawling is prohibited inside 2nm from shore (MHW) between Cape Farewell and Awarua Point except vessels targeting flatfish with low headline height nets, and measures as per Option 1
Option 3 – All trawling is prohibited inside 2nm from shore (MHW) between Cape Farewell and Awarua Point and measures as per Option 1

Analysis of options

Option 1

Option 1 requires the trawl fishers to develop and implement a CoP to mitigate the risk of trawling (mid-

water, bottom, and pair) on Hector's dolphins. A comprehensive monitoring programme of commercial trawl activity to assess the extent to which trawl vessels interact with Hector's dolphins would also be implemented by Government under this option. The monitoring programme would also be used to independently verify fisher compliance with the CoP.

- *Effectiveness*

This option requires fishers to adopt 'dolphin safe-fishing' practices when trawling within inshore areas. These practices could include using trawl gear that reduces the likelihood of interacting with Hector's dolphins such as low headline gear, no wing doors and low tow speed. Other measures could include fishing away from areas where dolphins are sighted or known to occur, fishing away from discoloured or murky waters, and quickly retrieving trawl gear if dolphins appear, maintaining a constant lookout when gear is deployed, and keeping tow duration to a minimum, etc. This approach accepts the use of such voluntary measures would mean trawling throughout the dolphins' range poses an acceptable risk.

MFish believes this option is only acceptable providing there is sufficient certainty that all trawl fishers will comply with a CoP. MFish invites the industry to submit information about developing a code for trawl fishing on the WCSI including how the level of compliance could be measured, and what actions could be taken on individual fishers who do not comply with specific measures. Alternatively, this option may only be acceptable if there is independent verification that fishers comply with the code and this could include the placement of fisheries observers and/or cameras on trawl vessels fishing within the dolphins' range.

- *Impacts on fishers*

The main utilisation impact of Option 1 is the requirement for trawl fishers to comply with a CoP that will require a modification to their fishing practices when fishing within 6nm from shore. Possible implications could include retrieving trawl gear when dolphins appear within the vicinity of the vessel, and this may lead to lower catch rates as a result of reduced tow duration.

If the Minister was to determine a monitoring programme was necessary to monitor compliance with the CoP and to help determine the nature and extent of residual risk to Hector's dolphins from trawling, economic impacts could potentially be significant. MFish cannot determine with accuracy the number of vessels that need to cover monitoring costs that can, for Fisheries Observers, reach up to $1000 per day. There are approximately 57 inshore trawl vessels (<46m) operating on the WCSI that may require Fisheries Observer coverage under Option 1. Fishers could potentially avoid monitoring costs by shifting effort outside 6nm and only incur the costs if wishing to fish inside 6nm. Video monitoring equipment is also an option that MFish can investigate with fishers, although installation and operating costs are also expensive (eg, around $10,000 installation and $100 per day to operate).

Option 1 will provide for greatest commercial trawl fishing along the WCSI in comparison with Options 2 and 3. Option 1 will enable commercial fishers to continue to use trawl nets in all areas but require them to more actively manage their fishing operations to mitigate Hector's dolphin bycatch.

MFish invites submissions from fishers that discuss the utilisation impacts of Option 1.

Option 2

Option 2 proposes, in addition to Option 1, prohibiting trawling (mid-water, bottom, and pair) within 2nm from shore between Cape Farewell and Awarua Point. Under this option, vessels targeting flatfish using low headline gear (<1m high) would still be able to fish within the proposed 2nm closure.

- *Effectiveness*

All known trawl-related interactions with Hector's dolphins have occurred within 2nm of the shore[160]. MFish considers that this is likely to be because there are relatively higher dolphin densities in the close inshore area (therefore increasing likelihood of interaction). Trawling in shallower waters may also present a greater risk to dolphins because there is less available water column above or below trawl gear for the dolphins to swim away from an approaching net – thereby increasing the chance of entanglement. MFish considers that vessels using a low headline height net type to target flatfish, in conjunction with proposed measures under Option 1, will pose a relatively low risk to Hector's dolphins.

MFish considers that because there is a lower density of dolphins and increased depth further offshore (combined with an apparent low level of interaction outside 2nm), risk to dolphins from trawling outside 2nm is lower than risk inside 2nm.

- *Impacts on fishers*

This option provides for some utilisation within the proposed 2nm closure as commercial fishers will still be able to target flatfish. MFish is unable to determine the effects of Option 2 on other WCSI trawl fisheries because fishers are generally not required to provide position and depth of bottom trawl information (MFish cannot determine the extent of fishing inside 2nm).

Nevertheless, MFish considers a trawl prohibition within 2nm from shore other than when targeting flatfish using low headline gear would likely have a limited impact of trawl vessels operating within the WCSI. Most of vessels working within 2nm are targeting flatfish, and typically catch a range of bycatch inshore species such as tarakihi, red gurnard and red cod. These vessels would be unaffected 2nm under this option providing low headline nets are used. While there will be additional costs of some fishers to shift effort outside 2nm, vessels will still be able to operate in most existing fisheries that typically occur in more deeper waters. MFish considers the major WCSI barracouta and red cod fisheries would still continue under this option.

MFish recognizes that mandatory gear design in the target flatfish fishery operating inside 2nm will be difficult to enforce under current compliance monitoring capacity. Additional monitoring that accompanies Option 2 (assuming the Minister chooses to monitor all target flatfish vessels) will help mitigate non compliance risk. MFish also welcomes comment from fishers on their proposals to ensure compliance with mandatory gear design should the Minister allow target flatfish fishing inside 2nm.

MFish invites submissions from fishers that discuss the utilisation impacts of Option 2.

Option 3

Option 3 proposes to prohibit all trawling (mid-water, bottom, and pair) within 2nm from shore between Cape Farewell and Awarua Point. Measures proposed under Option 1 would also apply where appropriate (ie, between 2nm and 6nm offshore between Cape Farewell and Awarua Point).

- *Effectiveness*

Proposed measures under Option 3 will give greater certainty of mitigating the risk of trawling on Hector's dolphins than Options 1 and 2.

Prohibiting trawling within 2nm effectively encompasses waters out to about 15-20m water depth in many areas and will protect a significant proportion of the Hector's dolphin population from the threat of

[160] Where the incident location is known

trawl gear.

- *Impacts on fishers*

A complete trawl prohibition within 2nm from shore would impact on a significant proportion of the WCSI target flounder fishery. This fishery is a significant component of the WCSI trawl fishery complex with annual catches ranging between 346 and 539 tonnes in the past three fishing years (2003-04 to 2005-06). During this period, the flatfish fishery had an annual 'gross' value of about $991 048, $1 491 132, and $1 754 445.

Most flatfish catches are taken in water depths less than 30 nm using low headline nets. As this fishery generally occurs within shallow waters close to shore, most target flatfish fishers would be required to shift effort outside 2nm and this is likely to have a major effect on the catch and value of this local fishery. During the 2005-06 fishing year, 48 vessels <46m caught flatfish on the WCSI. MFish is unable to quantify the extent to which these vessels could shift effort outside 2nm to continue to operate in the flatfish fishery.

As the proposed measures under this option would apply to all vessels operating within 2nm, MFish cannot determine the extent to which this will impact on local support businesses (eg, Licensed Fish Receivers).

MFish invites submissions from fishers that discuss the utilisation impacts of Option 3.