Elephant fish (ELE 3)

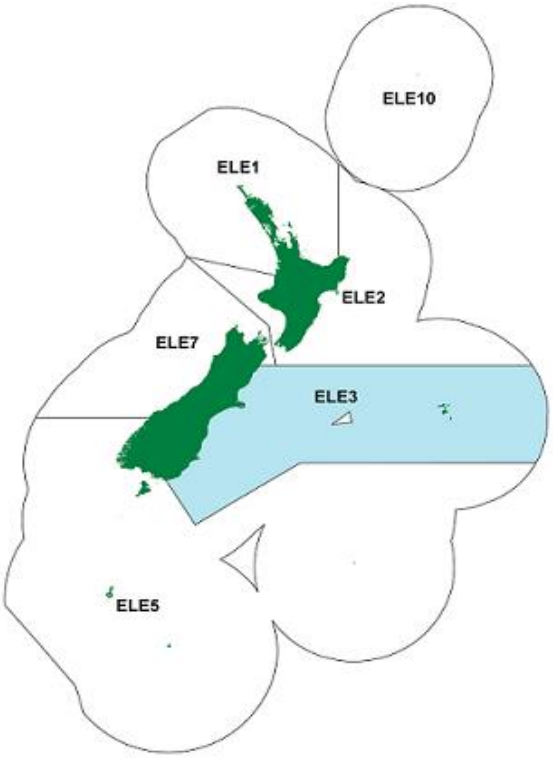

Figure 1: Quota Management Areas (QMAs) for elephant fish (ELE), with ELE 3 highlighted in blue.

1. What is proposed?

395. Fisheries New Zealand is reviewing the total allowable catch (TAC), allowance for Māori customary fishing, allowance for recreational fishing, allowance for all other mortality to the stock caused by fishing, and the total allowable commercial catch (TACC) for elephant fish (*Callorhinchus milii;* reperepe) in ELE 3 off the east coast of the South Island (see Figure 1). Fisheries New Zealand proposes that the following initial options be considered and seeks information and views from tangata whenua and stakeholders (Table 1):

Table 1: Proposed management settings in tonnes for ELE 3 from 1 October 2018, with the percentage change relative to the *status quo* in brackets.

Option	Total Allowable Catch (TAC)	Total Allowable Commercial Catch (TACC)	Allowances		
			Customary Māori	Recreational	All other mortality to the stock caused by fishing
Option 1 *(Status quo)*	1060	1000	5	5	50
Option 2	1228 ↑ (16%)	1150 ↑ (15%)	5	15 ↑ (200%)	58 ↑ (16%)

396. ELE 3 catch is approaching historically high levels (Figure 2) and the stock size appears to have increased substantially. Commercial fishers indicate that they find it difficult to stay within the TACC despite the low level of targeting on this species (40%).

397. The interim deemed value rate of ELE 3 is currently set at 90% of the annual deemed value rate and as the current interim and annual deemed value rates are consistent with the Deemed Value Guidelines, no changes are proposed to the deemed value rates for ELE 3, as outlined in Table 2.

Table 2: Standard Deemed Value Rates ($/kg) for ELE 3

	Interim Rate ($/kg)	Annual Differential Rates ($/kg) for excess catch (% of ACE)					
		100-120%	120-140%	140-160%	160-180%	180-200%	200%+
Status quo	1.50	1.65	1.98	2.31	2.64	2.97	3.30

2. Why the need for change?

398. Despite ELE 3 being substantially (at least 60%) a bycatch of the mixed trawl fishery off the east coast South Island, biomass appears to have increased and the current TACC has been consistently exceeded since 2009/10 (Figure 2). The fishery is at historically high recorded levels of catch. Catch has exceeded 1000 tonnes for each of the last five years and, is on track to exceed the TACC again this current fishing year.

3. Background

3.1 BIOLOGICAL CHARACTERISTICS OF ELEPHANT FISH

399. Elephant fish are uncommon around the North Island, but are plentiful off the east coast of the South Island. Elephant fish are fairly slow growing and late maturing with low fecundity, which all contributes to being vulnerable to fishing pressure.

400. Mature elephant fish migrate to shallow inshore waters in spring and aggregate for mating. Egg cases are laid on sand or mud bottoms, often in very shallow waters. After egg laying, the adults are thought to disperse and are difficult to target. The commercial sector have voluntarily closed a significant region of the Canterbury Bight to trawl fishing in order to protect the egg cases.

3.2 NATIONAL PLAN OF ACTION FOR SHARKS (NPOA SHARKS)

401. In reviewing the available indices of relative biomass and the catch limits and allowances for ELE 3 to ensure sustainable utilisation, Fisheries New Zealand is fulfilling several objectives of the National Plan of Action for Sharks (NPOA Sharks)[1]. Elephant fish is shark species identified as being within the scope of the Plan, and the Plan takes into account the biological characteristics of elephant fish, noting in particular the vulnerability of elephant fish to fishing pressure and the connectivity of stocks.

402. One of the goals of the NPOA Sharks is to maintain the biodivbersity and long-term viability of New Zealand shark populations, based on a risk assessment framework. The assessment framework evaluates stock status, measures to ensure any mortality is at

[1] The NPOA Sharks is accessible at: https://www.mpi.govt.nz/dmsdocument/1138-national-plan-of-action-for-the-conservation-and-management-of-sharks-2013. For more information on how Fisheries New Zealand manages sharks, see: https://www.mpi.govt.nz/protection-and-response/sustainable-fisheries/managing-our-impact-on-marine-life/sharks/

appropriate levels, and protection of critical habitat. Objectives of this goal that are met by the current review of elephant fish in ELE 3 are:

- For shark species managed under the quota management system (QMS), undertake an assessment to determine the stock size in relation to the level of biomass that can produce the maximum sustainable yield (B_{MSY}) or other accepted management targets and on that basis review catch limits to maintain the stock at or above these targets;

- Mortality of all sharks from fishing is at or below a level that allows for the maintenance at, or recovery to, a favourable stock and/or conservation status giving priority to protected species and high risk species; and

- Ensure adequate monitoring and data collection for all sectors (including commercial, recreational, customary fishers, and non-extractive users) and that all users actively contribute to the management and conservation of shark populations.

3.3 FISHERY CHARACTERISATION

Customary Māori fishery

403. Elephant fish (reperepe) is an important species for customary non-commercial fishing interests, by virtue of its wide distribution in shallow, accessible coastal waters.

404. When allowing for Māori customary non-commercial interests the Minister must take into account any mātaitai reserve within the relevant QMA. While there are a number of mātaitai, and taiāpure within ELE 3, Fisheries New Zealand notes that the proposals in this paper are unlikely to impact on these taiāpure and mātaitai reserves.

Recreational fishery

405. Recreational catches of elephant fish are small when compared to that of the commercial sector, with the principal methods being surf casting and rod/line use off a trailer motor boat. The methods used to manage recreational take of elephant fish include a maximum daily bag limit of five per person. There is no minimum size limit. There is no information to suggest a change to recreational controls such as, the recreational daily bag limit, are needed.

406. The 2011/12 National Panel Survey[2] is the best available information on recreational harvest for ELE 3. The NPS estimated 4853 elephant fish were harvested recreationally in ELE 3 during the 2011/12 fishing year. Based on the average weight of an elephant fish as 3 kg, using the National Panel Survey figure, this gives a proposed harvest weight of approximately 15 tonnes.

Commercial fishery

407. Commercial fishing for elephant fish in ELE 3 is seasonal, mostly occurring in spring and summer in inshore waters. Elephant fish in ELE 3 are predominantly taken as a bycatch

[2] Wynne-Jones J, Gray A, Hill L, Heinmann A (2014) National Panel Survey of Marine Recreational Fishers 2011-2012: Harvest Estimates. New Zealand Fisheries Assessment Report 2014/67. 139p. Accessible at: https://www.mpi.govt.nz/dmsdocument/4719/send

by bottom trawl fisheries targeting red cod, flatfish and barracouta. Targeting ELE 3 in the bottom trawl fishery has increased to around a third of the landings since 2004-05, when the deemed value regime changed. Around 15% of the ELE 3 landings are taken by set net in a fishery targeted at a number of shark species, including rig, elephant fish, spiny dogfish and school shark.

408. Catches from the commercial sector have consistently exceeded the TACC (figure 2) despite landings being substantially as a bycatch of other target fisheries, and efforts by many fishers to avoid catching elephant fish. It is possible that fisher avoidance and unreported catches have biased (low) the CPUE trends for this fishery.

409. Across the fishery, the annual deemed value penalty payments over the last five years have averaged $185,415. The significant deemed value payments appear to be a result of the abundance and availability of elephant fish in the ELE 3 fishery, as they are becoming harder to avoid. Fishers report that they are having to actively avoid elephant fish and this impacts on the ability to catch other target species within the mixed trawl, which in turn, is likely biasing downwards abundance indices using catch per unit effort (CPUE).

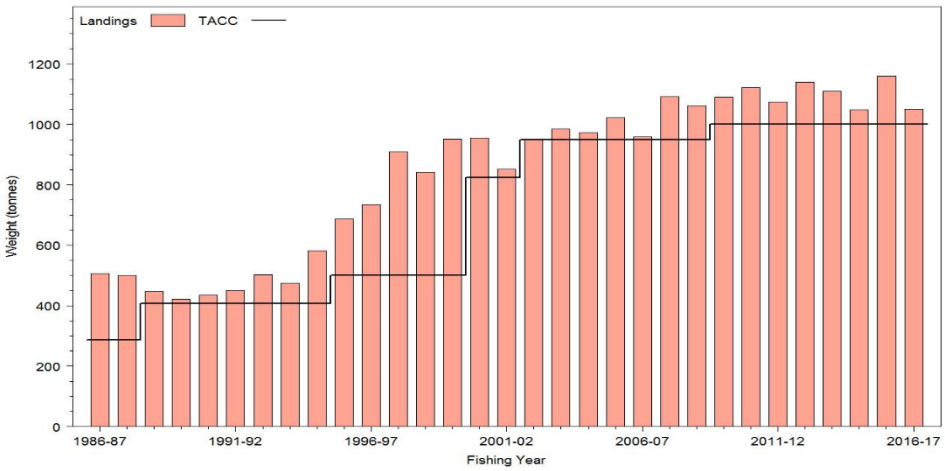

Figure 2. Reported commercial landings and TACC for ELE 3 from 1986/87 to 2016/17.

3.4 STATUS OF THE STOCKS

Management targets

410. ELE 3 is managed through the Harvest Strategy Standard. The target level is set at a CPUE index of 1.3. The state of the stock in relation to B_{MSY} is unknown and it is not known if the recent catch levels or the current TACC are sustainable. Fisheries New Zealand considers the ELE 3 (MIX) CPUE series to be an index of stock abundance. This suggests that ELE 3 is likely (40-60% probability) to be at, or above, the stock biomass management target.

Stock assessment

411. Key indicators used to monitor and inform management of ELE 3 include CPUE from the commercial fishery, which has been updated to the end of the 2014/15 fishing year, and a biennial fishery-independent estimate of relative biomass from the east coast South Island (ECSI) trawl survey (just completed). These abundance indicators are used to

estimate relative changes in stock status in relation to the target level, which is a proxy for B_{MSY}.

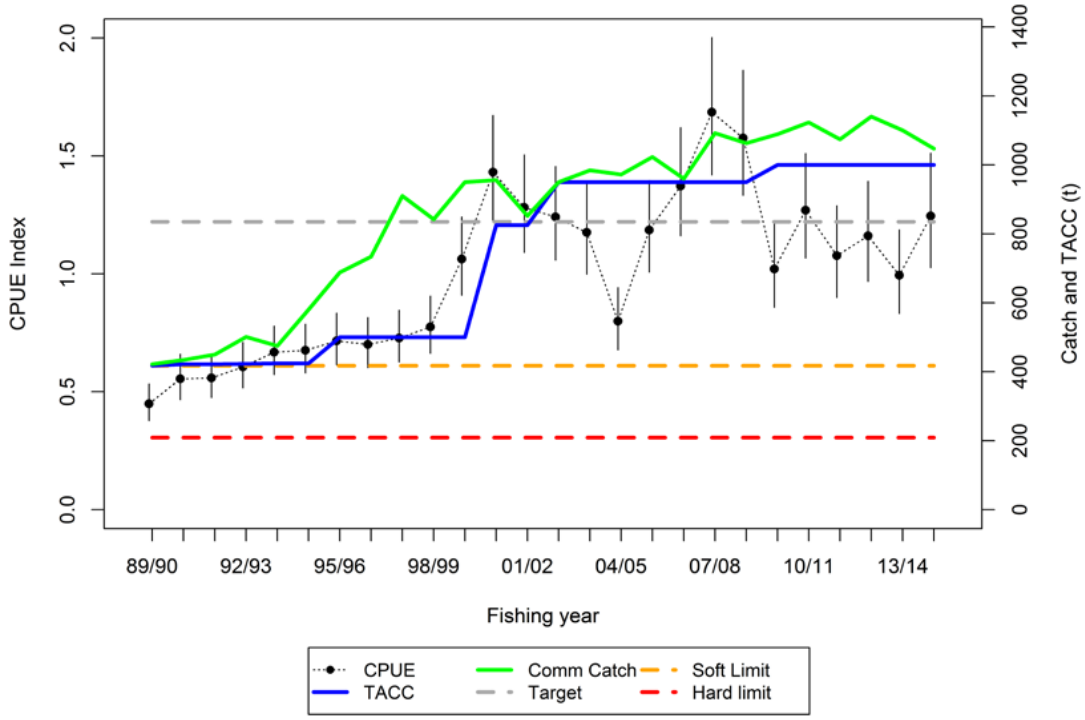

Figure 3: Comparison of the mixed target species bottom trawl CPUE series (ELE 3(MIX)) with the trajectories of catch (ELE 3(QMR/MHR)) and TACCs from 1989–90 to 2014–15. The dashed lines represent the interim target and corresponding soft limit and hard limit.

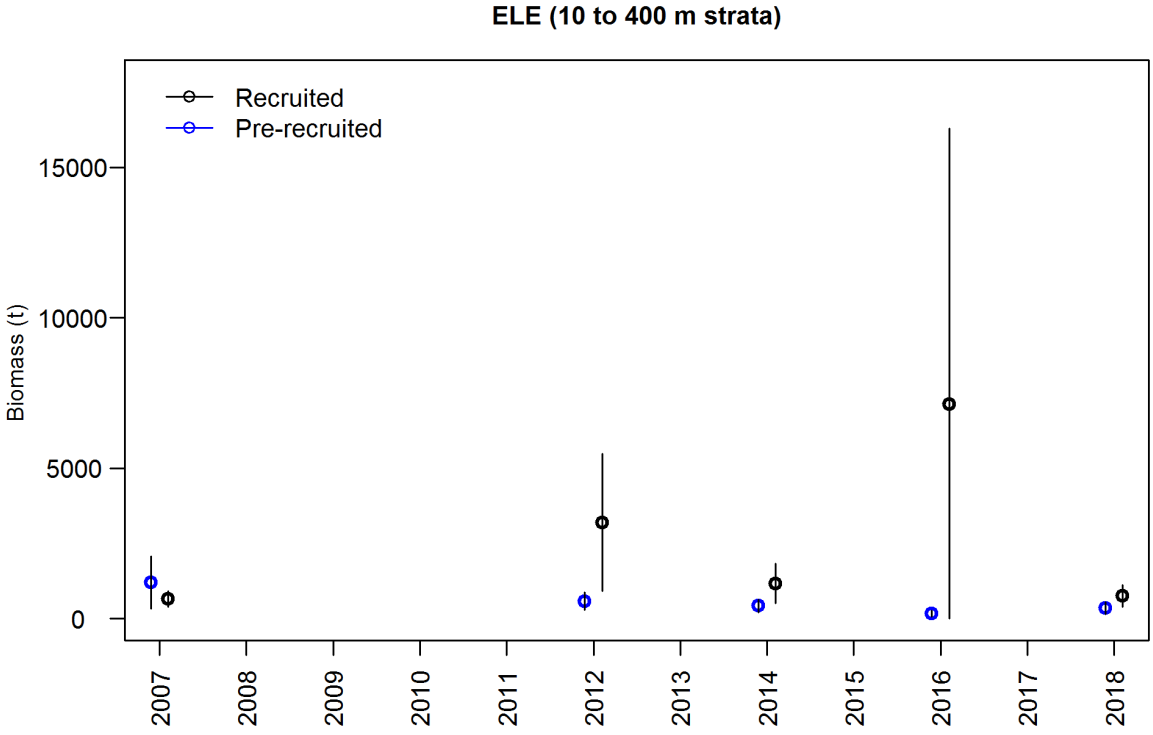

Figure 4: Elephant fish trawl survey pre-recruit and recruited biomass estimates from the biennial east coast South Island (ECSI) trawl survey, with associated confidence intervals, including the most recent survey which was completed in May 2018. Recruited fish were defined as fish above 40 cm fork length.

Status of the stock

412. The status of the ELE 3 stock is monitored through commercial CPUE indices and biennial trawl survey data of relative abundance.

413. The ELE 3(MIX) CPUE series is considered to be an index of stock abundance, showing a generally increasing trend from the beginning of the series in 1989/90. The series reached a peak in 2007/08, when the East Coast South Island trawl survey was expanded inshore (to depths less than 30 metres). The CPUE series over the most recent decade began at a time when CPUE predictions of the ELE 3 stock abundance were already high, but more recent indices since 2007/08 have remained relatively stable and fluctuated without trend near the proposed target (see Figure 3).

414. Results from East Coast South Island (ECSI) trawl surveys undertaken over the last decade do not provide strong indications for any trend in changes to the ELE 3 biomass (see Figure 4) and support the relatively stable ELE 3 CPUE indices. While the 2016 survey indicated a substantial biomass increase, and a latter decline in 2018, given the large confidence intervals (or error bars), Fisheries New Zealand considers the results of the 2016 survey an anomaly and unreliable for indicating any trend in the biomass index series, and is most likely a consequence of the tendency of elephant fish to aggregate.

415. For the exception of the 2016 trawl survey, both the ELE 3 CPUE and ECSI trawl survey indices suggests that the ELE 3 stock biomass levels have not varied significantly over the last decade.

416. Thus, while there is some uncertainty in the information from ELE 3 CPUE indices and trawl survey estimates, commercial ELE 3 catches remain consistently higher than the TACC in what is largely a bycatch fishery. This suggests that there is an abundance of ELE 3 available to be taken by commercial fishers that is greater than what the current ELE 3 TACC allows for.

417. Given that the high level of monitoring of this fishery allows for responsive intervention to any changes in ELE 3 abundance, Fisheries New Zealand considers that there is an opportunity for additional utilisation of ELE 3 that would not pose a risk to the sustainability of the stock in the long-term.

4. Why are these options proposed?

418. The options proposed for ELE 3 are given in Table 3 and discussed below.

Table 3: Proposed management settings in tonnes for ELE 3 from 1 October 2018, with the percentage change relative to the *status quo* in brackets.

Option	Total Allowable Catch (TAC)	Total Allowable Commercial Catch (TACC)	Allowances		
			Customary Māori	Recreational	All other mortality to the stock caused by fishing
Option 1 *(Status quo)*	1060	1000	5	5	50
Option 2	1228 ↑ (16%)	1150 ↑ (15%)	5	15 ↑ (200%)	58 ↑ (16%)

4.1 VARYING THE TAC

419. In cases such as ELE 3, where the B_{MSY} is not known, s 13(2A) of the Act provides for the Minister to use the best available information to set a TAC that is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, the B_{MSY} level.

420. The best available information is that the biomass level of elephant fish in ELE 3 is currently at or above the management target. CPUE as an index of relative abundance is likely to be biased downwards as fishers are actively avoiding elephant fish. The level of monitoring (CPUE and Trawl Survey) allows for responsive action to any change in the fishery. Consequently, there is an opportunity to increase utilisation (increase the TAC) while ensuring sustainability in a manner that is not inconsistent with the objectives of s13.

421. The current abundance of ELE 3 presents an utilisation opportunity. The best available information suggests both commercial and recreational catch is exceeding the current TAC, therefore it is proposed to increase both TACC and recreational allowance to account for this. Option 1

422. Option 1 is the *status quo,* meaning no change to the TAC and allowances.

423. Option 2 is a 16% increase in the TAC up to 1228 tonnes, 150 t increase for TACC, 10 t increase for recreational allowance, and 8 t increase for mortality allowance. This would provide for a modest increase in available ACE within the fishery to cover the existing over catch, because of current abundance, but with a low risk to sustainability.

424. Under either option, ongoing monitoring of the stock using CPUE and fishery independent trawl surveys (the next is in 2020) will enable responsive management and appropriate adjustments to address any risk or possible opportunity.

4.2 SETTING ALLOWANCES AND THE TACC

425. Having set the TAC, the Minister must make allowances for Māori customary non-commercial fishing interests, recreational fishing interests, and all other mortality to the stock caused by fishing (section 20 & 21).

Allowance for Māori customary fishing

426. There is no proposal to increase the customary allowance for ELE 3. The ELE 3 TAC was last reviewed in 2015. Customary catch data shows no increase in catch since the last review and that levels of customary catch are within the current customary allowance.

Allowance for recreational fishing

427. The 2011/12 National Panel Survey[3] (NPS) provided an estimate that 4853 elephant fish were harvested recreationally in ELE 3 during the 2011/12 fishing year. Given uncertainty in using this estimate to predict current or future catches and the strength of

[3] Wynne-Jones J, Gray A, Hill L, Heinmann A (2014) National Panel Survey of Marine Recreational Fishers 2011-2012: Harvest Estimates. New Zealand Fisheries Assessment Report 2014/67. 139p. Accessible at: https://www.mpi.govt.nz/dmsdocument/4719/send

the current stock biomass, Fisheries New Zealand considers it reasonable to provide for increases to the recreational allowance for ELE 3.

428. Based on the harvest weight estimate of NPS, an increase of 10 tonne (total allowance of 15 tonnes) is proposed to cover current recreational catch and allow recreational utilisation of the increased abundance.

Allowance for all other mortality to the stock caused by fishing

429. Information to inform the setting of an allowance for other sources of fishing-related mortality in ELE 3 is uncertain. Option 2 proposes an increase to this allowance that would result in the allowance being approximately 5% of the TACC. This proportion is based loosely on how robust the species is and the main fishing methods used.

TACC

430. ELE 3 is monitored by the biennial fishery-independent east coast South Island (ECSI) trawl survey and CPUE analyses.

431. Catches from the commercial sector have consistently exceeded the TACC (Figure 2) despite landings being substantially as a bycatch of other target fisheries, and efforts by many fishers to avoid catching elephant fish. It is possible that fisher avoidance and discarding have biased (low) the CPUE trends reported for this fishery.

432. The consistent levels of high catch indicate that there is capacity to fully catch the TACC to the levels proposed. Option 2 proposes an increase to the TACC from 1000 to 1150 tonnes, which aligns more closely with commercial landings since 2015/16. By increasing the TACC, fishers are more likely to be able to cover current levels of ELE 3 catch with ACE and, therefore, in addition to increased revenue from catches, will be less likely to incur deemed value payments.

4.3 DEEMED VALUE RATES

433. There are no proposed changes to the deemed value rates for ELE 3 for the 2018/19 fishing year (see Table 2 above).

4.4 EVALUATION OF OPTIONS

434. Elephant fish in ELE 3 are largely taken by bottom trawl in the flat fish target fishery. The level of targeting on this species is low, averaging less than 40% of the annual catch. Therefore, it is unlikely that there will be a meaningful increase in environmental interactions from the proposed increase.

435. The increase to catch limits and allowances proposed is considered to be sustainable, and supported by the best available information which suggests that elephant fish abundance in ELE 3 is at an historical high. However, biomass will vary over time as recruitment fluctuates and Fisheries New Zealand will continue to monitor the ELE 3 fishery using CPUE and the biennial ECSI inshore trawl survey.

436. The economic implications of the proposed option is outlined in Table 4.

Table 4: Predicted changes to commercial revenue of the proposed options, based on the price to the fisher of $2.63/kg for ELE 3 in 2017/18.

	TACC	Change from *status quo* (t)	Predicted revenue change ($ p.a.)
Option 1 *(Status quo)*	1000 t		
Option 2	1150 t	150 t ↑	$394,500 ↑

Option 1 (*Status quo*)

437. Option 1 proposes no change to the *status quo*. The existing TAC, TACC and allowances would be retained. As the stock is considered to be likely at or above target biomass, the current TAC is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield. This option reflects a cautious approach to change given the likely fluctuations in this fishery.

438. Retaining the current TAC settings does not respond to the high biomass in a way that would allow commercial fishers to obtain further value from the fishery, while difficulties experienced from avoiding elephant fish when targeting other species of the mixed fishery will also not be mitigated.

Option 2

439. An increase to the TAC, TACC and allowances under this option are considered to be sustainable, and supported by the best available information which suggests that abundance in ELE 3 is currently high.

440. Fishers report that elephant fish is acting as a "choke species", a species with low quota that can cause a vessel to stop fishing even if they still have quota for other species, in the FMA 3 mixed species trawl fishery and that they are having to avoid elephant fish when fishing for other species as there is insufficient ACE within the fishery to cover the quantity of bycatch.

441. An increase in TACC for ELE 3 will provide further ACE to cover the increase in elephant fish bycatch when targeting other fish species.

442. Available information indicates recreational and Māori customary take is within current allowances.

443. Fisheries New Zealand welcomes information and views of tangata whenua and stakeholders regarding these proposed options, including any other information to support alternate options.

5. Other Relevant Matters

5.1 ENVIRONMENTAL PRINCIPLES – SECTION 9

444. The proposals are not expected to significantly change the environmental impacts and interactions of the ELE 3 fishery (s 9 of the Act). The proposals will provide for additional ACE to cover existing catch primarily taken as bycatch of other target fisheries within the FMA 3 mixed trawl fishery. There is also a small set net fishery for elephant fish, mostly targeting rig. As additional targeted fishing effort is not expected for elephant fish (rather Option 2 provides additional ACE to cover catch that occurs as a bycatch), any additional impacts on bycatch species, protected species, and the benthic environment are unlikely.

445. There have been instances on the west and east coast of the South Island where endangered Hector's dolphin have been caught in commercial and non-commercial set nets. To manage this risk, a range of commercial and non-commercial set netting restrictions have been put in place around much of the coast in FMA 3.

446. From 1 October 2008 regulations intended to protect the Hector's dolphin were introduced in the ELE 3 fishery, restricting the use of set nets for commercial and recreational fishers out to 4 nautical miles with a few exceptions around estuaries and harbours. In addition, trawl gear within 2 nautical miles of shore was restricted to flatfish nets with defined low headline heights. Fisheries New Zealand considers that the proposed TACs under Option 2 will not result in an increase in set net effort in areas where Hector's dolphin may be found.

447. Commercial fishing for rig in ELE 3 is managed under the Harvest Strategy Standard. In addition, the NPOA sharks provides in setting fisheries management measures for species such as rig in ELE 3. Fisheries New Zealand notes that there is a rebuilding population of rig in ELE 3 and the proposed TAC options are consistent with the objectives of the NPOA sharks.

5.2 SUSTAINABILITY MEASURES-SECTION 11

448. Section 11 sets out various matters that the Minister must take into account or have regard to when setting or varying any sustainability measure (such as a TAC). See "Statutory Considerations" Part 1.6 for a full description.

449. Fisheries New Zealand has made the proposals after considering the requirements of s 11 of the Act, and seeks information and views from tangata whenua and stakeholders regarding s 11 matters they consider relevant to ELE 3.

5.3 INPUT AND PARTICIPATION OF TANGATA WHENUA

450. The proposal to consult on a sustainability review covering a range of South Island stocks was presented to the Iwi Fisheries Forum relating to South Island iwi, the Te Waka a Māui me Ōna Toka Iwi Forum. This forum represents the iwi of the South Island, each holding

mana moana and significant interests (both commercial and non-commercial) in South Island fisheries. The forum supports a review of the ELE 3 fishery.

451. Fisheries New Zealand will be taking the proposed options to the Te Waka a Māui me Ōna Toka Iwi Forum again in July to seek further input, and will incorporate the Forum's views into the final advice to the Minister.

Kaitiakitanga

452. Under Section 12(1)(b) the Minister must also have particular regard to kaitiakitanga before setting or varying a TAC. Under the Act, kaitiakitanga is the exercise of guardianship, and in relation to any fisheries resources, includes the ethic of stewardship based on the nature of the resources, as exercised by the appropriate tangata whenua in accordance with tikanga Māori.

453. Relevant Iwi or Forum Fish Plans provide a view of the objectives and outcomes iwi seek from the management of the fishery and can provide an indication of how iwi exercise kaitiakitanga over fisheries resources. Iwi views from Forum meetings and submissions received from iwi can also provide an indication.

454. Elephant fish (mangorepe) is identified as a tāonga species in the Te Waipounamu Iwi Fisheries Plan. This plan contains objectives to support and provide for the interests of South Island iwi. That Forum Fisheries Plan contains three objectives which are relevant to the management options proposed for ELE 3:

    a) Management objective 1: to create thriving customary non-commercial fisheries that support the cultural wellbeing of South Island iwi and our whānau;

    b) Management objective 3: to develop environmentally responsible, productive, sustainable and culturally appropriate commercial fisheries that create long-term commercial benefits and economic development opportunities for South Island iwi; and
    c) Management objective 5: to restore, maintain and enhance the mauri and wairua of fisheries throughout the South Island.

455. Fisheries New Zealand considers that the management options presented in this advice paper will contribute towards the achievement of these three management objectives in ensuring that appropriate allowances are made for customary non-commercial fishing, the fishery remains sustainable, and that environmental impacts are minimised.

6. Further Information

Should you require further information, please see:

Fisheries Act (1996)

http://www.legislation.govt.nz/act/public/1996/0088/latest/DLM394192.html

Fisheries New Zealand Plenary document

Fisheries New Zealand (2018). Fisheries Assessment Plenary, May 2018: stock assessments and stock status. Compiled by the Fisheries Science Group, Fisheries New Zealand, Wellington, New Zealand.

ELE 3 Sustainability Round Review 2009
www.mpi.govt.nz/document-vault/7770