

Green-lipped mussel (GLM 9)

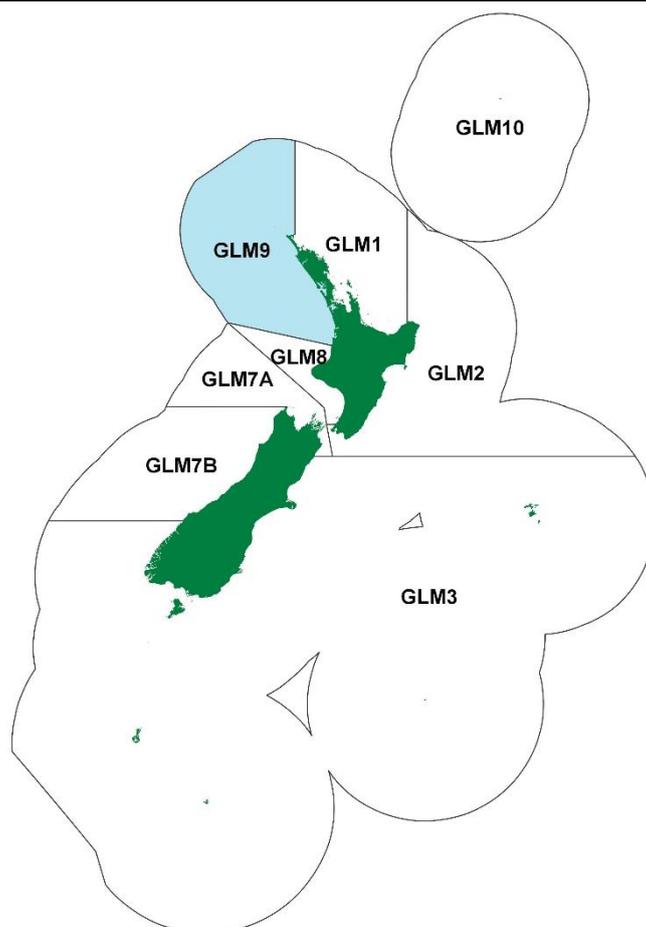


Figure 1: Quota Management Areas (QMAs) for green-lipped mussel (GLM), with GLM 9 highlighted in blue.

1. What is proposed?

532. Fisheries New Zealand is reviewing the following management controls for green-lipped mussel (*Perna canaliculus*; kuku; kutai) in the quota management area GLM 9, which is off the northwest coast of the North Island (see Figure 1):

- a. The spat ratio used to report green-lipped mussel spat and seaweed taken together at Te Oneroa-a-Tohe/Ninety Mile Beach (the majority of fishing currently occurring in GLM 9). **The decision on the spat ratio will be made by the Head of Fisheries New Zealand or an official acting under delegated authority.**
- b. 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 green-lipped mussel in GLM 9. This part of the review recognises that the proposed adjustment to the spat ratio could have significant impacts on the way that the Quota Management System operates for this stock. **Decisions on the catch limits will be made by the Minister of Fisheries¹.**

¹ The TAC decisions will be requested after the spat ratio decision has been made to ensure the full context of the spat ratio can be taken into account.

533. Fisheries New Zealand proposes the following initial options and seeks information and views from tangata whenua and stakeholders for both the proposed change to the spat ratio and the catch limit settings (Table 1):

Table 1: Proposed management settings for GLM 9 (spat ratio, catch limits in tonnes, and allowances in tonnes) from 1 October 2018, with the percentage change relative to the current settings in brackets.

Option	Reporting ratio for spat:seaweed taken from Ninety Mile Beach	Total Allowable Catch (TAC)	Total Allowable Commercial Catch (TACC)	Amount of seaweed/spat material that can be harvested	Allowances		
					Customary Māori	Recreational	All other mortality to the stock caused by fishing
Current settings	50:50*	278	180	<i>360 t of seaweed & spat</i>	59	39	0
Option 1	25:75 ↓ (50%)	188 ↓ (32%)	90 ↓ (50%)	<i>360 t of seaweed & spat</i>	59	39	0
Option 2	25:75 ↓ (50%)	278	180	<i>720 t of seaweed & spat</i>	59	39	0

* Under the current 50:50 ratio, 50% of the weight of the combined seaweed/ spat material taken at Ninety Mile Beach is assumed to be, and recorded as, “GLM 9”.

534. No changes are proposed to the deemed value rates for GLM 9 which were last reviewed in 2017. The interim deemed value rate for GLM 9 is currently set at 90% of the annual deemed value rate and the current interim and annual deemed value rates are consistent with the Deemed Value Guidelines².

Table 2: Deemed value rates (\$/kg) for GLM 9

	Interim Rate (\$/kg)	Annual Deemed Value Rate(\$/kg)	Deemed value rate for catch >105% of ACE holdings (\$/kg)
Status quo	9.00	10.00	20.00

2. Why the need for change?

535. New information is available about the composition of catches in the GLM 9 commercial fishery, which targets green-lipped mussel spat (mussels less than 10 mm) attached to beachcast or floating seaweed at Te Oneroa-a-Tohe/ Ninety Mile Beach. The new information supports a change to the “spat ratio” that is used to record how much of this catch is spat and how much is seaweed. The practical effect of the spat ratio proposal is that it would allow for twice as much of the combined spat/seaweed material to be taken within the current TACC. Given the TACC has been exceeded in the last three years and there is a strong demand for the spat to supply New Zealand’s valuable mussel farming industry there is significant support to enable increased catches. However, members of

² Available at www.mpi.govt.nz/document-vault/3663

the Te Hiku o te Ika Fisheries Forum have expressed concern about any changes to management that would result in increased fishing activity for green-lipped mussel spat at Te Oneroa-a-Tohe/ Ninety Mile Beach.

536. Given the proposed changes and concerns Fisheries New Zealand consider a review of the wider management regime including the TAC, allowances and TACC is warranted.

3. Background

3.1 FISHERY CHARACTERISATION

537. Green-lipped mussels are an important customary and recreational species gathered by hand from shore or while diving.
538. There is currently no targeted commercial harvest of adult green-lipped mussel in GLM9, but there is a significant and important fishery for mussel spat which is collected at Te Oneroa-a-Tohe/ Ninety Mile Beach attached to floating or beachcast seaweed.

Ninety Mile Beach Spat Fishery

539. New Zealand's mussel farming industry relies heavily on Te Oneroa-a-Tohe/ Ninety Mile Beach supply to seed mussel lines for production. Ninety Mile Beach spat is estimated to account for at least 65% of the industry's spat requirements. In total the industry generated around \$351 million in revenue in 2017.
540. Harvesting of spat and seaweed has been occurring at Te Oneroa-a-Tohe/ Ninety Mile Beach since the 1970s and has been managed within the Quota Management System (QMS) since green-lipped mussels across New Zealand were introduced into the QMS in 2004.

Management framework

541. A key rationale for managing the spat fishery within the QMS was to create a framework to improve efficiency of harvesting in the context of growing demand for the mussel spat. Prior to the QMS the harvest was managed using aquaculture permits. In the early 2000s the various permit applications totaled 600 tonnes a year (approximately five times what was actually being taken). The QMS provided a mechanism to prevent a "race to catch" by setting a Total Allowable Commercial Catch and allocating rights to harvest a share of the TACC.
542. Mussel spat is an unusual fishery because by the time the spat has washed ashore at Ninety Mile Beach it has already been disrupted from settling and growing in its natural habitat, and is unlikely to survive and contribute back to the stock. This makes management of the harvest of this mussel spat quite different to managing most fisheries. To reflect this difference, GLM 9 has been included on Schedule 3 of the of the Fisheries Act 1996 (the Act), which lists stocks where an alternative approach to setting TACs can be undertaken under section 14. While the approach must be consistent with the purposes of the Act, there is no requirement to take into account or be guided by the need to manage in accordance with Maximum Sustainable Yield (MSY). The original TAC for GLM 9 was set to reflect the likely demand for the spat fishery while also providing for non-commercial harvest of adult mussels.

543. A fundamental part of the operation of the QMS is the reporting of commercial catches and balancing against Annual Catch Entitlement. Because it is not practical to weigh mussel spat separately when it is harvested, the seaweed/spat material is weighed, and a spat ratio set under section 188A of the Act is used to translate the combined weight of spat and seaweed into separate weights for reporting. The current spat ratio assumes 50 % of the material is spat and 50% is seaweed. For example, 5 tonnes of combined spat and seaweed will be reported as 2.5 tonnes of spat and 2.5 tonnes of seaweed.

Current Concerns

544. Limited information was available to inform the setting of the spat ratio in 2004. Research³ has since been undertaken to investigate concerns that the current spat ratio overestimates the amount of spat taken per kilogram of seaweed. This results in an unreasonable limit on the total amount of spat that can be harvested within the TACC.

545. The research has involved analysis by the University of Auckland of samples of seaweed/spat catches supplied by commercial spat harvesters in both 2014 and 2016 and comparison with results of a 2004 project by the Mussel Industry Council. The research involved measuring and recording the composition of random sub-samples within the 10-30kg taken.

546. Fishers were used to collect samples because spat-fall is sporadic and the harvesters have the best opportunity to collect material immediately after it washes up. Spat is well mixed on arrival at the beach and spat collectors were not aware of the specific scientific purpose of the collected material. Independent researchers used standard subsampling methodologies, separation techniques and laboratory equipment to determine the proportion of spat in the collected material. Both formal review and follow-up correspondence with the researchers involved confirms the robustness and independence of the results from this study.

547. The results of the research (discussed in section 4.1) suggest that the current spat ratio is incorrect, and that spat accounts for a much lower proportion by weight of the seaweed/spat material than the current 50:50 assumption.

548. Ninety Mile Beach spat is likely to remain important to supply new mussel farms if the aquaculture sector is to meet its growth aspirations. The current combination of the GLM 9 Total Allowable Commercial Catch (TACC), deemed values (sanctions that have been set to support the TACC) and spat ratio is potentially creating a significant constraint to future growth of the mussel farming industry (see Figure 2). A review of controls has been sought to better provide for growth.

³ University of Auckland *Determining the mussel spat composition of harvested mussel spat material – final report* (2016)

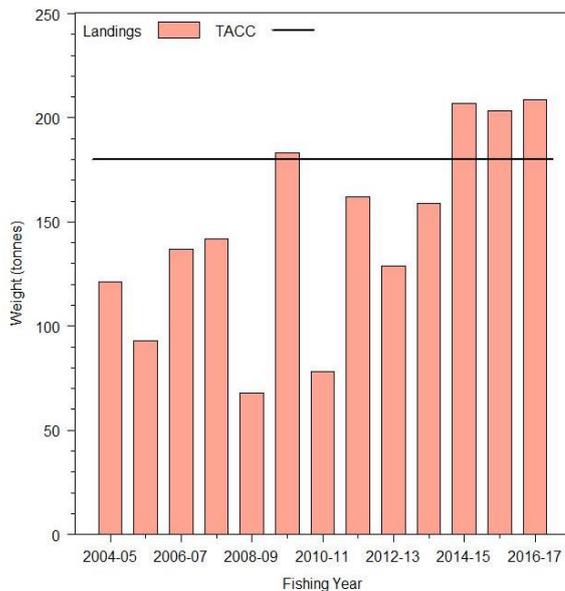


Figure 2: Landings vs Total Allowable Commercial Catch (TACC) in tonnes for GLM 9 from 2004/05 to 2016/17.

549. Members of the Te Hiku o Te Ika Fisheries Forum have raised concern about expansion of the fishery. In particular, the increasing use of mechanical harvesters (modified tractors) which have been adopted by fishers to increase efficiency in gathering the combined seaweed and spat material. In 2007 research was undertaken on this topic by NIWA for a key quota holder (Kaitaia Spat)⁴. This report concluded that there was little difference in the impact between the mechanical harvesting method and hand-gathering methods. However concerns remained about the harvesting methods and in a management plan developed by iwi, fishing and marine farming representatives in 2010 it was agreed that industry would consider the appropriateness of current and further means to avoid adverse effects from vehicles and or harvesting practices on Te Oneroa a Tohe/ Ninety Mile Beach. Members of the Te Hiku o te Ika Fisheries Forum have reported continued concerns about ongoing and increased use of mechanical harvesting methods and have reported that tractors are being used in a way which is aggressive to the beach environment.

4. Why are these options proposed?

550. The options proposed for GLM 9 are given in Table 3 and discussed below.

⁴ Sim-Smith, C.; Jeffs, A.G.; Cole, R. (2007). *Assessment of the impact of mechanical harvesting of mussel spat on the infauna of Ninety Mile Beach*. Unpublished NIWA Client report AKL2007-21. 17pp.

Table 3: Proposed management settings for GLM 9 (spat ratio, catch limits in tonnes, and allowances in tonnes) from 1 October 2018, with the percentage change relative to the current settings in brackets.

Option	Reporting ratio for spat:seaweed taken from Ninety Mile Beach	Total Allowable Catch (TAC)	Total Allowable Commercial Catch (TACC)	Amount of seaweed/spat material that can be harvested	Allowances		
					Customary Māori	Recreational	All other mortality to the stock caused by fishing
Current settings	50:50*	278	180	360 t of seaweed & spat	59	39	0
Option 1	25:75 ↓ (50%)	188 ↓ (32%)	90 ↓ (50%)	360 t of seaweed & spat	59	39	0
Option 2	25:75 ↓ (50%)	278	180	720 t of seaweed & spat	59	39	0

* Under the current 50:50 ratio, 50% of the weight of the combined seaweed/ spat material taken at Ninety Mile Beach is assumed to be, and recorded as, “GLM 9”.

4.1 PROPOSAL TO ADJUST THE SPAT RATIO

551. For the 33 10-30kg samples of seaweed/spat material analysed over 2004/05 (11 samples), 2014 (11 samples) and 2016 (11 samples), the mean proportion by weight of spat in harvested material was 18% (95% confidence between 13.8 - 22.4%). While this information demonstrated that spat/seaweed composition varied between years and samples, the average composition ratio for all samples is significantly lower than the current 50:50 spat/seaweed ratio used for reporting purposes.
552. Fisheries New Zealand considers that the new information supports revising the ratio to 25:75 (25% spat to 75% seaweed). This ratio would better align with section 10 of the Act, which requires decisions to be based on the best available information. Fisheries New Zealand seeks your feedback on this proposal.
553. A decision on the ratio will be made by the Head of Fisheries New Zealand (or a delegated official), by notice in the *Gazette*, in accordance with section 188A of the Act.
554. Any reduction in the spat to seaweed ratio would increase the amount of seaweed/spat material allowed to be collected. Therefore, Fisheries New Zealand considers that the ratio, TAC and TACC settings should be considered side by side.
555. Given the scale of change proposed (to halve the amount of spat reported per unit of seaweed/spat material) and the consequent increase that this could have on the amount of spat/seaweed that can be harvested (double), Fisheries New Zealand considers it appropriate to also review whether changes should be made to the TAC, allowances, and TACC for GLM 9.

4.2 SETTING THE TAC

556. As previously described in the management framework section, the mussel spat fishery is unusual because once the spat attached to seaweed has been washed ashore on Ninety Mile Beach it has already been effectively removed from the population. The standard concerns about limiting harvest to ensure sustainability of the GLM mussel stock therefore do not apply. Because the spat fishery will likely remain the largest source of fishing in the stock Fisheries New Zealand recommends that the TAC for GLM 9 continues to be set under section 14 of the Act which provides a flexible approach to TAC setting, while consistent with the purposes of the Act. A key focus for setting the TAC for GLM9 is to manage utilisation and any associated impacts on the environment.
557. Option 1 would reduce the TAC from 278 tonnes to 188 tonnes. This option would maintain the current level of harvest of spat if the spat ratio was changed as proposed. This option places weight on the concerns raised during pre-consultation that additional harvesting activity could cause additional or exacerbate current environmental impacts. This option may be appropriate to support management of environmental impacts of harvesting if no alternative tools to manage this issue are proposed during consultation.
558. Option 2 retains the TAC at 278 tonnes. In conjunction with the proposal to decrease the spat ratio, Option 2 allows for increased catches, on the basis that there is no sustainability risk to the GLM9 stock associated with an increase in catches, and any impacts on the environment of additional harvesting activity can be mitigated through other management controls.

4.3 SETTING ALLOWANCES AND THE TACC

559. In setting or varying any TACC, 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 (s 20 & 21 of the Act).

Allowance for Māori customary fishing

560. The current allowance for Māori customary fishing is 59 tonnes.
561. Fisheries New Zealand records show that the harvest of green-lipped mussels occurs through customary authorisations (over 400 permits issued since 2003 in GLM 9). Total catches are uncertain because the authorisations use different units of measurement (bags, bins, buckets) and because many tangata whenua in the area are still operating under regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013, which does not require that customary permits or catches be reported.
562. No change is proposed to the current allowance of 59 tonnes for Māori customary fishing. Feedback from tangata whenua is sought to inform decisions on the allowance.

Allowance for recreational fishing

563. The current allowance for recreational fishing is 39 tonnes.

564. The best available information to estimate the recreational harvest of green-lipped mussels in GLM 9 is the National Panel Survey of Marine Recreational Fishers 2011/12.⁵ This survey estimated that 153,711 mussels were taken in GLM 9 in 2011/12. An estimated weight of the 2011/12 catch is not provided in the National Panel Survey, however it would likely be significantly below the 39 tonne allowance currently set. However, Fisheries New Zealand notes there is uncertainty in this estimate and that recreational catches are also likely to vary from year to year.
565. Given these factors, Fisheries New Zealand considers that 39 tonnes remains an appropriate allowance for recreational fishing and no change is proposed. An updated National Panel Survey is currently underway and will provide results in 2019.

Allowance for all other mortality to the stock caused by fishing

566. The allowance for all other mortality typically includes incidental mortality on the stock caused by fishing methods and/or unreported mortality from illegal activity. Fisheries New Zealand does not have any information to suggest that these, or other types of fishing mortality need to be accounted for in GLM 9. No changes are proposed to the current allowance of zero.

TACC

567. The current TACC of 180 tonnes aligns with the competitive catch limit in place when the fishery was managed using spat catching permits, prior to introduction into the Quota Management System (QMS). Support for the 180 tonne commercial catch limit was further reinforced in a stakeholder agreement submitted in response to QMS introduction in 2004. The TACC was based on the demand for spat at that time to supply existing mussel farms, but since QMS introduction, the number and size of mussel farms has grown substantially.
568. A reduction to the TACC from 180 tonnes to 90 tonnes (Option 1) would be consistent with maintaining the status quo level of spat/seaweed material being taken in the fishery if the spat ratio is adjusted from 50:50 to 25:75.
569. Retaining the current TACC at 180 tonnes (Option 2) would allow for a significant increase in catch.
570. While it is unlikely, under the current management framework it is possible that adult mussels could be targeted commercially. If this were to occur it may warrant a further review of management. Commercial fishers are required to report mussel spat (MSP) and other sized mussels (MSG) separately, and these reports are monitored to help identify any changes in the nature of the fishery that may support the need for a review.

⁵ 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>

4.4 DEEMED VALUE RATES

571. There are no proposed changes to the deemed value rates for GLM 9 for the 2018/19 fishing year (see Table 2 above).
572. The deemed value rates for GLM 9 were last reviewed in 2017, resulting in the annual deemed value being increased from \$6.00/kg to \$10.00/kg to better reflect the commercial value of the spat and to help constrain GLM 9 harvest within the available ACE. Changes were also made to the differential and interim deemed value rates for these reasons.
573. During consultation in 2017, concerns were raised by some stakeholders that the increases to deemed value rates were creating further constraints on the fishery. A key purpose of the deemed value framework is to incentivise fishers to balance their catches with Annual Catch Entitlement. Fisheries New Zealand considers that concerns about constraints on the fishery and the availability of Annual Catch Entitlement are best addressed through the setting of the TAC and the TACC. No further changes to the deemed value rates are proposed this year.

4.5 EVALUATION OF OPTIONS

574. Option 1 is based on an adjustment to the TAC and TACC to align with the current limits after factoring in the impact of the proposed adjustment to the spat ratio. It provides for the same total of spat/seaweed material (360 tonnes) to be taken off the beach. The economic implications of this option would be a direct constraint on utilisation for fishers and run-on constraints on the potential growth of the mussel farming industry.
575. Option 1 places weight on the concerns raised during pre-consultation that additional harvesting activity could cause environmental impacts. We seek comments on the ongoing nature and extent of the concerns about environmental impact of harvesting.
576. Fisheries New Zealand note that ideally other management controls are used to avoid, remedy or mitigate the adverse effects of fishing rather than restrictions on catch as a means to limit effort. There has been a longstanding intention to manage this issue via discussions and work between iwi an industry. We ask tangata whenua and stakeholders to submit on opportunities and tools to better manage the environmental concerns such that greater levels of utilisation (such as those proposed under Option 2) could be authorised. Fisheries New Zealand would be happy to facilitate discussions and work between the groups if that would be beneficial.
577. Option 2 proposes no changes to the TAC and TACC in response to the proposed spat ratio adjustment. This would effectively provide for an increased total harvest of/ spat seaweed material (from 360 tonnes to 720 tonnes).
578. Retaining the current TAC and TACC while adjusting the spat ratio would create economic opportunities for fishers and for the potential growth of the green-lipped mussel farming industry.
579. Feedback and information is sought to further quantify and assess the impacts of the two options.

4.6 INPUT AND PARTICIPATION OF TANGATA WHENUA

582. The management of the green-lipped mussel fishery has been discussed with Fisheries New Zealand at Te Hiku o te Ika Fisheries Forum on a number of occasions. Te Hiku o Te Ika Fisheries Forum comprises mandated representatives of the commercial and non-commercial interests of the following iwi organisations; Ngati Kuri Trust Board Inc, Te Urungi O Ngati Kuri Ltd, Te Runanga Nui o Te Aupouri Trust, Te Aupouri Fisheries Ltd, Nga Taonga o Ngai Takoto Trust, Ngai Takoto Holdings Ltd, Te Runanga o Te Rarawa, Te Waka Pupuri Putea Ltd.
583. Members of the Forum have expressed a concern about any changes to management that would result in increased fishing activity for green-lipped mussel spat. Information on the spat ratio and proposals to adjust the spat ratio and review the TAC settings for GLM 9 has been provided to the Forum prior to the release of this paper. In response Ngati Kuri has reiterated that they are against any changes to the GLM9 harvesting regime due to concerns about increased heavy vehicle activity which will impact more on their struggles to revitalise or rejuvenate the toheroa. Further discussion is scheduled with the Forum in July.

Kaitiakitanga

584. Under Section 12(1)(b) the Minister must 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.
585. Green-lipped mussel, including spat, is identified as a taonga species in the Te Hiku o te Ika Fisheries Management Plan. Key objectives within the plan relevant to the review of GLM 9 management controls include ensuring that fish stocks are healthy and support the social, cultural and economic prosperity of Te Hiku iwi and Hapu and to maximise iwi influence on all key environmental decisions that impact on fisheries.
586. Fisheries New Zealand will be taking the proposed options to the Te Hiku o te Ika Fisheries Forum in July to seek further input, and will incorporate the Forum's views into the final advice to the Minister.

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.