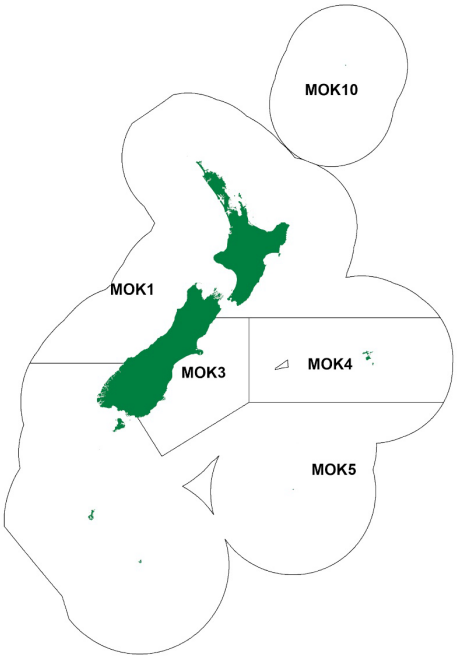
BLUE MOKI (MOK)

(*Latridopsis ciliaris*)
Moki



1. FISHERY SUMMARY

Allowances, TACCs, and TACs are shown in Table 1.

Table 1: Recreational and Customary non-commercial allowances, other mortality, TACCs, and TACs (t) for blue moki by Fishstock.

Fishstock	Recreational allowance	Customary non-commercial allowance	Other sources of mortality	TACC	TAC
MOK 1*	–	–	–	403	–
MOK 3	22	1	18	176	217
MOK 4*	–	–	–	25	–
MOK 5*	–	–	–	44	–
MOK 10*	–	–	–	10	–

* allowances and TAC not set

1.1 Commercial fisheries

Most blue moki landings are taken by set net or trawl off the east coast between the Bay of Plenty (BoP) and Kaikoura, although small quantities are taken in most New Zealand coastal waters. Although the proportions of the total commercial landings taken by set net and trawl have varied over time, set netting has been the predominant method, accounting for 50–60% of the annual catch during 1989–90 to 2011–12. The proportion of the catch taken by set net declined in the more recent years (to 2015–16) and catches by the two methods were at about parity during this period.

Reported landings and TACCs are given in Table 2 and Table 3, and an historical record of landings and TACC values for the two main MOK stocks are depicted in Figure 1. Landings of blue moki peaked in 1970 and 1979 at about 960 t. Blue moki stocks appeared to have been seriously depleted by fishing prior to 1975 and this resulted in the sum of allocated ITQs being markedly less than the sum of the catch histories.

Table 2: **Total reported landings (t) of blue moki from 1979 to 1985–86.**

Year	1979*	1980*	1981*	1982*	1983†	1983–84†	1984–85†	1985–86†
Landings	957	919	812	502	602	766	642	636

*MAF data.

†FSU data.

Table 3: **Reported landings (t) and actual TACCs (t) of blue moki by Fishstock from 1986–87 to present. Source: QMS data. MOK 10 is not tabulated; no landings have ever been reported from MOK 10.**

Fishstock	MOK 1		MOK 3		MOK 4		MOK 5		Total	
FMA (s)	1,2,7,8,9		3		4		5 & 6			
	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
1986–87	109	130	52	60	0	20	3	40	164	260
1987–88	183	142	95	62	0	20	2	40	280	274
1988–89	134	151	121	64	0	20	3	40	258	285
1989–90	202	156	89	65	11	25	1	43	303	299
1990–91	264	157	93	71	1	25	2	43	360	306
1991–92	285	157	66	71	2	25	2	43	355	306
1992–93	289	157	94	122	1	25	4	43	388	358
1993–94	374	200	102	126	4	25	5	43	485	404
1994–95	418	200	90	126	< 1	25	3	43	511	404
1995–96	435	400	91	126	1	25	3	43	530	604
1996–97	408	400	66	126	2	25	3	43	479	604
1997–98	416	400	78	126	3	25	2	43	500	604
1998–99	468	400	78	126	< 1	25	4	43	551	604
1999–00	381	400	56	126	1	25	5	43	443	604
2000–01	420	400	67	126	5	25	6	43	499	604
2001–02	365	403	77	127	8	25	2	44	451	608
2002–03	380	403	87	127	2	25	6	44	475	608
2003–04	372	403	60	127	2	25	6	44	440	608
2004–05	418	403	70	127	3	25	11	44	502	608
2005–06	408	403	69	127	1	25	5	44	483	608
2006–07	402	403	90	127	< 1	25	11	44	504	608
2007–08	401	403	125	127	< 1	25	8	44	533	608
2008–09	413	403	103	127	1	25	8	44	525	608
2009–10	386	403	129	127	< 1	25	6	44	521	608
2010–11	421	403	144	127	< 1	25	10	44	574	608
2011–12	427	403	137	127	< 1	25	6	44	571	608
2012–13	385	403	159	127	< 1	25	5	44	549	608
2013–14	393	403	134	127	< 1	25	7	44	535	608
2014–15	376	403	146	160	< 1	25	7	44	530	631
2015–16	395	403	183	160	< 1	25	8	44	586	631
2016–17	387	403	162	160	< 1	25	7	44	555	631
2017–18	435	403	178	160	< 1	25	7	44	620	631
2018–19	388	403	149	160	< 1	25	5	44	543	641
2019–20	384	403	167	160	< 1	25	2	44	553	641
2020–21	280	403	169	176	< 1	25	3	44	453	657
2021–22	335	403	172	176	< 1	25	3	44	511	657
2022–23	345	403	169	176	< 1	25	5	44	519	657
2023–24	402	403	143	176	< 1	25	6	44	551	657

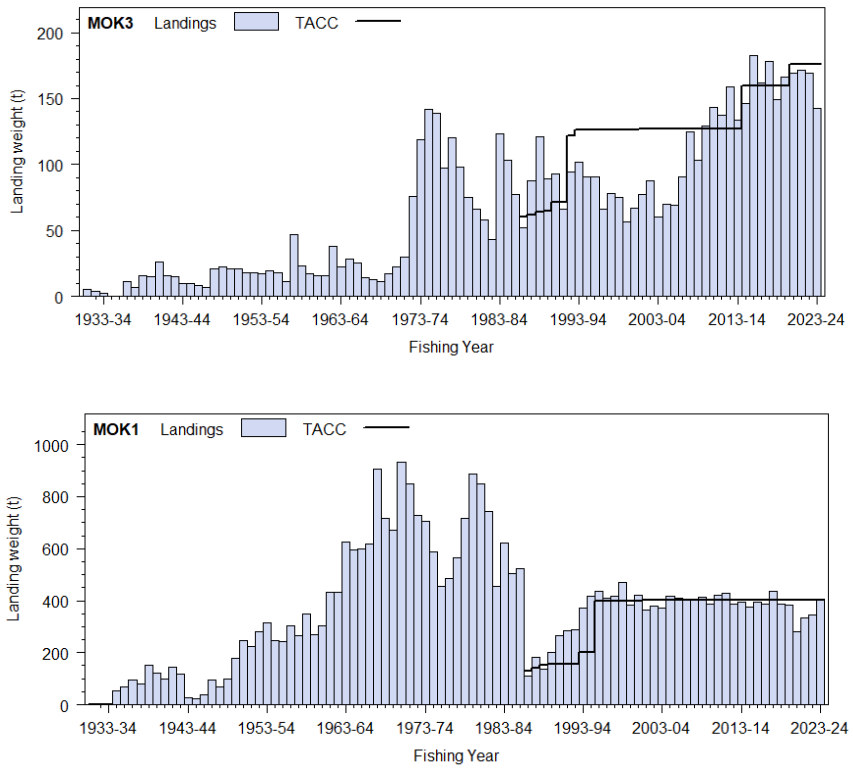


Figure 1 Reported commercial landings and TACC for the two main MOK stocks: MOK 1 (Auckland, Central, and Challenger) and MOK 3 (South East Coast).

Total annual landings of blue moki were substantially constrained when it was introduced into the QMS. In MOK 1, landings increased as the TACC was progressively increased. Since the TACC was set at 400 t (1995–96) landings have fluctuated around the TACC, which was subsequently increased to 403 t in 2001–02.

Landings from MOK 3 increased from the mid–2000s and exceeded the TACC of 127 t from 2010–11. The TACC was increased to 160 t in 2014–15 ans 176 t in 2020–21. The combined MOK 1 and 3 catch fluctuated around 500 t per annum during 1994–95 to 2009–10. Since then annual landings have been about 550 t and peaked at over 600 t in 2017–18. Annual landings from MOK 4 and 5 are generally < 10 t.

1.2 Recreational fisheries

Popular with recreational fishers, blue moki are taken by beach anglers, set netting, and spearfishing.

The first recreational harvest estimates were provided by offsite telephone-diary surveys conducted between 1991 and 2001 (Bradford 1998, Teirney et al. 1997, Boyd & Reilly 2005). These estimates are no longer considered to be reliable by the Marine Amateur Fishing Working Group (MAFWG), because the method was prone to 'soft refusal' bias during recruitment of potential participants and overstated catches during reporting (Wright et al. 2004). The recreational harvest estimates provided by the 2000 and 2001 telephone-diary surveys were also thought to be implausibly high for many species by the MAFWG.

Concerns about the reliability of these telephone diary surveys and the limited spatial extent at which onsite survey methods can be cost effectively applied led to the development of a rigorously designed National Panel Survey (NPS) for the 2011–12 (1 October–30 September) fishing year (Wynne-Jones et al. 2014). This NPS survey used face-to-face interviews of a random sample of 30 390 households to recruit a panel of 7013 fishers and non-fishers for a full year. The panel members were contacted regularly about their fishing activities and catch information was collected in standardised computer-assisted telephone interviews. NPS surveys have subsequently been repeated in 2017–18 and 2022–23 (1 October–30 September) following the same design as used in 2011–12, with face-to-face interview surveys of 34 431 and 36 197 households being used to recruit 6975 and 5625 panellists in each year respectively (Wynne-Jones et al. 2019, Heinemann & Gray 2024) (Table 4). Note that national panel survey estimates do not include recreational harvest taken on charter vessel trips or under s111 general approvals.

Table 4: Recreational harvest estimates for blue moki stocks (Wynne-Jones et al 2014, 2019, Heinemann & Gray 2024). Mean weights from boat ramp surveys (Hartill & Davey 2015, Davey et al 2019; 2024).

Stock	Year	Method	Number of fish	Total weight (t)	CV
MOK 1	2011–12	Panel survey	21 890	44.4	0.33
	2017–18	Panel survey	15 241	29.9	0.23
	2022–23	Panel survey	4 511	9.6	0.41
MOK 3	2011–12	Panel survey	5 584	11.3	0.54
	2017–18	Panel survey	8 267	16.2	0.30
	2022–23	Panel survey	3 878	8.3	0.49
MOK 5	2011–12	Panel survey	243	0.5	1.02
	2017–18	Panel survey	7 018	13.8	0.58
	2022–23	Panel survey	1 168	2.5	0.89

1.3 Customary non-commercial fisheries

A traditional Maori fishery exists in some areas, particularly the eastern Bay of Plenty and East Cape regions. No quantitative information is available on the level of customary non-commercial catch.

Iwi in the Cape Runaway area have a strong view that blue moki are of special significance in the history and life of the community. They believe that blue moki come to spawn in the waters around Cape Runaway and there are traditional fishing grounds, where in earlier years fishing took place in accordance with customary practices. In addition, these local Iwi consider the taking of blue moki by nets in this area to be culturally offensive.

Since September 1996, fishing by the methods of trawling, Danish seining, and set netting has been prohibited at all times within a two nautical mile wide coastal band beginning at the high water mark and extending from Cape Runaway to a stream tributary at Oruiti Beach. Note this is not a legal description, for full details please refer to the Fisheries Act (Auckland and Kermadec Areas Commercial Fishing Regulations 1986, Amendment No. 13).

1.4 Illegal catch

No quantitative estimates are available.

1.5 Other sources of mortality

Some blue moki caught for use as rock lobster bait have not been reported. Although little information is available, this practice appears to have been most common around Stewart Island and the Chatham Islands and may have accounted for about 45 t and 60 t from Stewart Island and Chatham Islands, respectively, in the past. The use of blue moki as bait has not been considered in the determination of *MCY*.

2. BIOLOGY

Blue moki grow rapidly at first, attaining sexual maturity at 40 cm fork length (FL) at 5–6 years of age. Growth then slows, and fish of 60 cm FL are 10–20 years old. Fish over 80 cm FL and 43 years old have been recorded (Manning et al 2009).

Many adults take part in an annual migration between Kaikoura and East Cape. The migration begins off Kaikoura in late April–May as fish move northwards. Spawning takes place in August–September in the Mahia Peninsula to East Cape region (the only known spawning ground), with the fish then returning south towards Kaikoura. The larval phase for blue moki lasts about 6 months.

Juvenile blue moki are found inshore, usually around rocky reefs, whereas most adults school offshore over mainly open bottom. Some adults do not join the adult schools but remain around reefs.

Biological parameters relevant to the stock assessment are shown in Table 5.

The estimate of natural mortality, given a maximum age of 43 years and using the equation $M = \log_e 100$/maximum age, is 0.1. Note that the maximum age for this calculation is meant to be the maximum age that 1% of the unfished population will reach, however, as this is not known, the maximum observed age was used here.

Table 5: Estimates of biological parameters for blue moki.

Fishstock	Estimate	Source
1. Natural mortality (*M*)		
All areas For maximum observed age of 33 yr.	0.14	Francis (1981b)
MOK 1 For maximum observed age of 44 yr.	0.10	Manning et al (2009)

2. Weight = a(length)^b (Weight in g, length in cm fork length).

	Both sexes	
	a	b
All areas	0.055	2.713

Source: Francis (1979)

3. von Bertalanffy growth parameters

	Both sexes		
	L_∞	k	t_0
All areas	66.95	0.208	-0.029

Source: Francis (pers. comm.)

3. STOCKS AND AREAS

There are no new data which would alter the stock boundaries given in previous assessment documents.

Blue moki forms one stock around the North Island and the South Island north of Banks Peninsula. No information is available to indicate stock affiliations of blue moki in other areas (southern South Island and Chatham Rise) so these fish are currently divided into three Fishstocks.

4. STOCK ASSESSMENT

4.1 Estimates of fishing mortality

Estimates of total mortality (*Z*) for MOK 1 were obtained from catch curve analysis of catch sampling data collected during 2004–05 and 2005–06. Samples were taken from both the target set net fishery and from bycatch from the TAR 2 trawl fishery. When data were pooled across the two years, sexes and fishing methods, *Z* estimates ranged from 0.11 to 0.14, depending on assumed age-at-full recruitment (ages 4–12 years were tested). Assuming a value of natural mortality of 0.10 (based on a maximum age of 44 years), this suggests that recent fishing mortality is likely to be in the range of about 0.01 to 0.04. The Working Group considered that the most plausible age-at-full recruitment was 8 years. The estimate of Z and the bootstrapped 95% confidence intervals were 0.14 (0.12–0.16), giving rise to an *F* estimate of 0.04 (0.02–0.06). These estimates are well below the current assumed value of natural mortality (Manning et al 2009).

4.2 CPUE analyses

In 2017, a summary of the recent trends in catch from the MOK 1 and MOK 3 fisheries was presented to the Southern Inshore Fishery Assessment Working Group (Langley 2018). The analysis identified three main fisheries catching blue moki:

1. The bottom trawl fishery operating within the Gisborne-Mahia area (Statistical Area 013) throughout the year.
2. The target blue moki set net fishery operating between East Cape and Wairarapa (Statistical Areas 014–015) primarily during May–October.
3. The Kaikoura set net fishery (Statistical Area 018) operating during May–June and October.

For each fishery, a standardised CPUE analysis was conducted for 1989–90 to 2015–16. All three CPUE analyses modelled the positive catch of blue moki assuming a lognormal error structure, and the CPUE analysis of the tarakihi bottom trawl fishery (BT-TAR2-North) also modelled the presence of blue moki in the catch and derived delta-lognormal CPUE indices (Figure 2).

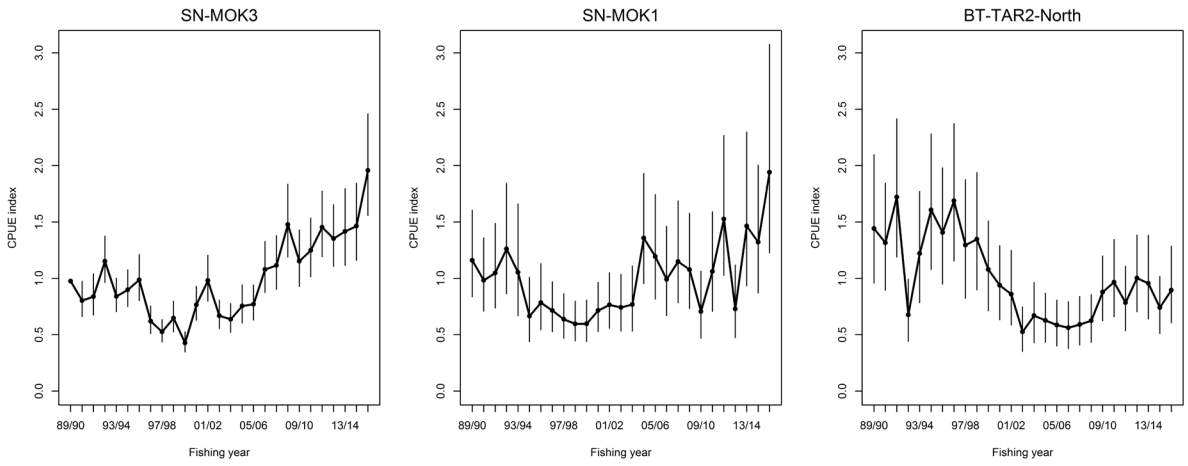


Figure 2: CPUE indices and 95% confidence intervals from the three main MOK 1 and MOK 3 fisheries.

The SN-MOK3 CPUE indices increased from a relatively low level in 1996–97 to 1999–2000 to reach the highest level of the time series in 2015–16. The SN-MOK1 CPUE indices increased during the same period although the CPUE indices are considerably more variable among years and are less well

determined than the SN-MOK3 CPUE indices. The higher variability in the SN-MOK1 indices appears to be related to the inter-annual variation in the operation of the fishery (between Statistical Areas) and limited continuity in the core set of vessels participating in the fishery.

The SINSWG rejected the SN-MOK1 and SN-MOK3 CPUE indices as monitoring tools which could be used to determine stock status against Harvest Standard reference points, for the following reasons:

1. High inter-annual variation in the CPUE indices due to the low precision of CPUE indices derived from limited catch-effort data sets from these small fisheries and/or inter-annual variation in the catchability (availability) of migrating fish.
2. Possible hyperstability as a result of fishing directed at dense schools of migrating fish.

The WG nevertheless agreed that the SN-MOK1 and SN-MOK3 CPUE indices were likely to be broadly indicative of trends in abundance.

The two sets of SN CPUE indices are considered to represent the component (or components) of the blue moki stock migrating northward prior to spawning and then returning southward following spawning. These CPUE indices indicate that there has been a general increase in the abundance of adult blue moki within MOK 3 and the southern area of MOK 1 from the late 1990s. This is consistent with the estimates of total mortality derived from the population age structure in 2005–06 that indicated that fishing mortality on the adult population was less than natural mortality (*M*).

The BT-TAR2-North CPUE indices contrast the trend in the CPUE indices from the two set net fisheries. The BT-TAR2-North CPUE indices declined from 1996–97 to 2002–03 and remained at a relatively low level during 2002–03 to 2008–09. The index increased in 2009–10 and remained at about that level during 2010–11 to 2015–16. These recent indices are at a level considerably lower than the indices from 1989–90 to 1996–97 (with the exception of the low 1992–93 index).

The BT-TAR2-North CPUE indices are considered to predominantly comprise a component of the blue moki stock that remains in the Gisborne-Mahia area throughout the year. The trawl catch is probably comprises both immature and mature blue moki, although limited sampling of this component of the stock was conducted during the catch sampling programme. The SINSWG considered that the BT-TAR2-North CPUE series potentially provides an index of abundance for the resident portion of the population, but did not provide a monitoring tool for the entire population.

The contrasting trends in the CPUE indices (SN-MOK1 and SN-MOK3 versus BT-TAR-North) are indicative of differences in the stock dynamics (recruitment and/or exploitation) in the two components of the stock (resident and migrating). It was not considered feasible to amalgamate the three sets of CPUE indices to derive a composite set of abundance indices for the MOK 1&3 stock because the relative proportion of the stock biomass monitored by each CPUE series is unknown. Thus, the utility of the CPUE series is limited to the monitoring each component of the stock separately.

4.3 Biomass estimates

Estimates of current and reference biomass are not available.

4.4 Yield estimates and projections

MCY for all Fishstocks combined was estimated using the equation, $MCY = cY_{AV}$ (Method 4). The national catch, and probably effort, over the period 1961–86 varied considerably (annual landings ranged from 450 to 957 t with an average value of 705 t). However, no clear trend in landings over that period is apparent. The value of c was set equal to 0.9 based on the estimate of $M = 0.14$.

$$MCY = 0.9 * 705 \text{ t} = 635 \text{ t}$$

The level of risk to the stock by harvesting the population at the estimated *MCY* value cannot be determined.

Yield estimates for blue moki have been made using reported commercial landings data only and therefore apply specifically to the commercial fishery. Blue moki have been caught and used as bait and

not reported. Therefore, the *MCY* estimates are likely to be conservative.

No estimate of *CAY* is available for blue moki stocks.

4.5 Other factors

CPUE data from the 1970s for the main northern blue moki stock indicated that the stock had declined to a level low enough to make recruitment failure a real concern. The 1986–87 TAC was set at a level considered low enough to enable some stock rebuilding.

Blue moki forms one stock around the North Island and the east coast of the South Island north of Banks Peninsula. As other stock boundaries are unknown, any interdependence is uncertain. If only one stock exists, then blue moki from the southern waters may be moving north and rebuilding the heavily exploited northern population.

5. STATUS OF THE STOCKS

Stock Structure Assumptions

Blue moki forms one stock around the North Island and the South Island north of Banks Peninsula. The bulk of the commercial catch is taken off the east coast between Banks Peninsula and East Cape, suggesting that this is where most of the blue moki stock resides.

MOK 1&3

Stock Status		
Most Recent Assessment Plenary Publication Year	2017	
Intrinsic Productivity Level	Low	
Catch in most recent year of assessment	Year: 2015–16	Catch: 578 t
Assessment Runs Presented	2008 – Catch-at-age 2017 – Three CPUE series	
Reference Points	Target: Not established but $F = M$ assumed Soft Limit: 20% B_0 Hard Limit: 10% B_0 Overfishing threshold: Not established but $F = M$ assumed	
Status in relation to Target	F is Very Likely (> 90%) to be below M	
Status in relation to Limits	Soft Limit: Unknown Hard Limit: Unknown	
Status in relation to overfishing	F is Very Unlikely (< 10%) to be above M	

Historical Stock Status Trajectory and Current Status	-

Fishery and Stock Trends	
Recent Trend in Biomass or Proxy	Catch curve analysis from catch sampling the migratory adult population (2004–05 and 2005–06) indicated that total mortality was low, with fishing mortality well below natural mortality. The general increase in CPUE from the SN-MOK1 and SN-MOK3 fisheries suggests that the biomass of migratory adults has increased since then.
Recent Trend in Fishing Intensity or Proxy	Low estimates of fishing mortality in 2005–06 and stable catches over the previous 14 years suggest that fishing mortality had been low for more than two decades. Recent increases in CPUE suggest that adult biomass has increased since the catch-at-age study, and together with constant

	catch suggests that fishing mortality remains below the target.
Other Abundance Indices	-
Trends in Other Relevant Indicators or Variables	CPUE indices from three fisheries are not considered to be sufficiently reliable to represent abundance indices for the stock. Rather, the indices are considered to be indicative of general trends in abundance for components of the stock. The SN-MOK1 and SN-MOK3 CPUE indices indicate that there has been a general increase in the abundance of adult blue moki within MOK 3 and the southern area of MOK 1 from the late 1990s. By contrast the BT-TAR2N series suggests that resident MOK in the northern part of FMA2 (Mahia Peninsula) declined to the mid-2000s and then increased to 2010–11, after which it fluctuated without trend at a level approximately half of that in the early 1990s.

Projections and Prognosis	
Stock Projections or Prognosis	If catches remain at current levels then fishing mortality should remain below the target.
Probability of Current Catch or TACC causing Biomass to remain below or to decline below Limits	Soft Limit: Unknown Hard Limit: Unknown
Probability of Current Catch or TACC causing Overfishing to continue or to commence	Fishing mortality was estimated to be below the target fishing mortality level (M) in the mid-2000s. Since then, there has been a general increase in stock abundance of the migrating adult component of the stock (as indicated by the CPUE trends). It is therefore Unlikely (< 10%) that fishing mortality will exceeds the overfishing threshold at current catch levels.

Assessment Methodology and Evaluation		
Assessment Type	Level 2 - Partial Quantitative stock assessment	
Assessment Method	Estimates of total mortality using Chapman-Robson estimator	
Assessment Dates	Latest assessment Plenary publication year: 2017	Next assessment: Unknown
Overall assessment quality rank	1 – High Quality	
Main data inputs (rank)	- Age structure of setnet and trawl catches of blue moki made between Kaikoura and East Cape in 2004–05 and 2005–06 -Instantaneous rate of natural mortality (*M*) of 0.10 based on a maximum age of 44 years -CPUE indices for migrant components of the stock (SN-MOK1 and SN-MOK3 CPUE)	1 – High Quality 2 – Medium or Mixed Quality: uncertainty in estimate of M 2 – Medium or Mixed Quality: may not be fully representative
Data not used (rank)	N/A	
Changes to Model Structure and Assumptions	-	
Major Sources of Uncertainty	Uncertainty in the estimate of *M* Reliability of CPUE indices as indices of stock abundance.	

Qualifying Comments
-

Fishery Interactions
Interactions with other species are currently being characterised.

6. FOR FURTHER INFORMATION

Boyd, R O; Reilly, J L (2005) 1999/2000 National marine recreational fishing survey: harvest estimates. Final Research Report for Ministry of Fisheries Research Project REC9803. (Unpublished report held by Fisheries New Zealand, Wellington.).

Bradford, E (1998) Harvest estimates from the 1996 national marine recreational fishing surveys. New Zealand Fisheries Assessment Research Document 1998/16. 27 p. (Unpublished document held by NIWA library, Wellington.)

Colman, J A; McKoy, J L; Baird, G G (Comp. & Ed.) (1985) Background papers for the 1985 Total Allowable Catch recommendations. Fisheries Research Division, New Zealand Ministry of Agriculture and Fisheries. 259 p. (Unpublished report, held by NIWA library, Wellington).

Davey, N; Hartill, B; Carter, M (2019) Mean weight estimates for recreational fisheries in 2017–18. Draft New Zealand Fisheries Assessment Report held by Fisheries New Zealand.

Davey, N K; Johnson, K S; Maggs, J Q (2024) Mean weight estimates for recreational fisheries in 2022–23. *New Zealand Fisheries Assessment Report 2024/28*. 39 p.

Francis, M P (1979) A biological basis for the management of New Zealand moki (*Latridopsis ciliaris*) and smoothhound (*Mustelus lenticulatus*) fisheries. (Unpublished MSc thesis, University of Canterbury, Christchurch, New Zealand).

Francis, M P (1981a) Spawning migration of moki (*Latridopsis ciliaris*) off eastern New Zealand. *New Zealand Journal of Marine and Freshwater Research* 15: 267–273.

Francis, M P (1981b) Age and growth of moki, *Latridopsis ciliaris* (Teleostei: Latridae). *New Zealand Journal of Marine and Freshwater Research* 15: 47–49.

Hartill, B; Davey, N (2015) Mean weight estimates for recreational fisheries in 2011–12. *New Zealand Fisheries Assessment Report 2015/25*.

Heinemann A; Gray, A. (2024) National Panel Survey of Recreational Marine Fishers 2022-23. *New Zealand Fisheries Assessment Report 2024/51*. 116 p.

Horn, P (1988) Blue moki. New Zealand Fisheries Assessment Research Document 1988/10. 11 p. (Unpublished document held by NIWA library, Wellington.)

Langley, A D (2018) Fishery characterisation and Catch-Per-Unit-Effort analysis for blue moki (*Latridopsis ciliaris*) in MOK 1 and MOK 3. *New Zealand Fisheries Assessment Report 2018/1*. 52 p.

Langley, A D; Walker, N (2004) Characterisation of the blue moki (*Latridopsis* ciliaris) fishery and recommendations for future monitoring of the MOK 1 Fishstock. *New Zealand Fisheries Assessment Report* 2004/33. 77 p.

Manning, M J; Stevenson, M L; Dick, C M (2009) The length and age composition of the commercial catch of blue moki (*Latridopsis ciliaris*) in MOK 1 during the 2004/05 and 2005/06 fishing years including total and fishing mortality estimates. *New Zealand Fisheries Assessment Report* 2010/34. 65 p.

Teirney, L D; Kilner, A R; Millar, R E; Bradford, E; Bell, J D (1997) Estimation of recreational catch from 1991/92 to 1993/94 New Zealand Fisheries Assessment Research Document 1997/15. 43 p. (Unpublished document held by NIWA library, Wellington.)

Wright, P; Gowing, L; McClary, D; Boyd, R O (2004) 2000–01 National Marine recreational fishing survey: direct questioning of fishers compared with reported diary data. Final Research Report of Ministry of Fisheries Research Project REC2000-01, Objective 2. 28 p. (Unpublished document held by Fisheries New Zealand, Wellington.)

Wynne-Jones, J; Gray, A; Heinemann, A; Hill, L; Walton, L (2019) National Panel Survey of Marine Recreational Fishers 2017–2018. *New Zealand Fisheries Assessment Report 2019/24.* 104 p.

Wynne-Jones,J; Gray, A; Hill, L; Heinemann, A (2014) National Panel Survey of Marine Recreational Fishers 2011–12: Harvest Estimates. *New Zealand Fisheries Assessment Report 2014/67*. 139 p.