

Adopted Minutes

Meeting	Mulloway Harvest Strategy Working Group		
Meeting Number(s)	1 Parts a/b/c	Dates	15/22/29 November 2021
Location	Online	Time	various
Members	<p>Independents: James Findlay (Chair), Sevaly Sen (Economist), Bob Kearney (Scientist)</p> <p>Commercial fishers: Johnny Alessi, Stephen Reed, Troy Billin</p> <p>Recreational fishers: David Rae, Paul Lennon, Mark Corbin</p> <p>DPI Fisheries Manager: Heath Folpp</p> <p>DPI Fisheries Scientist: Julian Hughes</p>		
Apologies	Aboriginal fishing representative: Stephan Schnierer (Mtg 1a)		

Meeting 1 Part a 15 November 2021

Agenda Item	Issue	Notes & Actions
1.	Welcome and introduction	<p>1.1 Welcome and introduction</p> <p>The Chair opened by acknowledging Traditional Custodians and paying respects to Elders past, present and emerging. He then welcomed all members and invited Deputy Director General Fisheries Sean Sloan (DDG) to address the group.</p> <p>The DDG thanked members for volunteering their time and emphasised the importance of stakeholders working together to identify management measures that safeguard the resource while supporting each of their sectors. He outlined some key issues facing Mulloway in NSW and how harvest strategy development should benefit this species, given the expertise of the recreational, commercial, and Aboriginal fishing representatives, independent experts and DPI members and staff supporting this group.</p> <p>There is an immediate need to rebuild the stock from its current <i>Depleted</i> status, toward being <i>Sustainable</i>. As harvest strategy development may take 18-24 months, the DDG asked the group to identify monitoring/management measures that could get the stock moving in the right direction during this time. He also noted that a broader Ecological Risk Assessment would be done for Mulloway, looking at all threats, not just fishing.</p>

		<p>1.2 Apologies and recognition of observers</p> <p>Apologies were received from Stephan Schnierer; observers from DPI were accepted.</p> <p>1.3 Confirmation of Agenda</p> <p>The Agenda for the meeting was accepted without modification.</p> <p>1.4 Introduction to Members</p> <p>The Chair asked members and observers to introduce themselves.</p> <p>1.5 Declaration of Pecuniary Interests</p> <p>This was compiled by DPI and circulated before the meeting.</p> <p>1.6 Terms of Reference for this HSWG</p> <p>The group was reminded that these govern the proceedings, and that the group is a sub-committee of the Recreational Fishing NSW and Commercial Fishing NSW Advisory Councils. The Aboriginal Fishing Advisory Council will also be kept informed of progress.</p> <p>1.7 Progress of other NSW fisheries harvest strategies</p> <p>DPI provided an update on other harvest strategies developed to-date. This will be a regular agenda item to promote consistency.</p>
2.	Purpose, scope and timeline (WP-01-01)	<p>DPI presented Working Papers WP-01-01 and WP-01-02.</p> <p>Co-management of harvest strategy development was noted as a guiding principle, so all stakeholders can discuss and decide on management measures. DPI must ensure that harvest strategies are consistent with their responsibilities under the <i>Fisheries Management Act 1994</i> and other legislation and policy, notably the NSW Fisheries Harvest Strategy Policy & Guidelines (HSP&G).</p>
3.	Harvest Strategy Structure (WP-01-02)	<p>A timeline for developing the strategy was proposed. Although this group has a two-year life, it should focus on harvest strategy development over the next 6-8 months, as this will be followed by a review and approvals that may take up to 6 months.</p> <p>The standard structure for NSW harvest strategies was presented, consistent with the HSP&G and other NSW harvest strategies. As Mulloway is currently classed as <i>Depleted</i> harvest strategy development should focus on stock rebuilding in the first instance, with the main objective being to achieve <i>Sustainable</i> stock status.</p> <p>Action</p> <p>The group endorsed the proposed structure and timeline, which will be revisited as the work of the group progresses.</p>

4.	NSW Stock Assessment (WP-01-03)	<p>DPI presented Working Paper WP-01-03. This paper is available at: https://www.dpi.nsw.gov.au/fishing/commercial/open-for-comment/stock-status-summary-reports</p> <p>The stock assessment uses a 'weight-of-evidence' approach, considering multiple data types and sources, including reported commercial catch, estimated recreational catch, commercial catch rates, size and age composition. Mortality estimates, Spawning Potential Ratio and Yield-per-Recruit analyses are also done.</p> <p>The uncertainties/assumptions in the analyses were recognised, including size composition of historical landings (commercial and recreational), amount of historical recreational harvest, changes in gear types and efficiency, changes in reporting, effect of management measures, and whether the length composition of commercial landings is representative of the stock.</p> <p>Conclusions: Mulloway has been assessed as overfished/depleted in NSW since the early 2000s and is assessed as <i>Depleted</i> in 2020, i.e. biomass is likely depleted to <20% and recruitment impaired. A mulloway recovery plan was established in 2013 to assist stock rebuilding, and reviewed and amended in 2018. Current fishing mortality is constrained by management to a level that may allow the stock to recover from its recruitment impaired state; however, measurable improvements are yet to be detected.</p> <p>Discussion</p> <p>The group discussed the reliability of various data sources and noted there remains uncertainty if indicators considered in isolation. In particular it was noted that the amount of days targeting Mulloway and other effort data is not well captured and that catch at length sampling is unlikely to be representative of the catch for all methods and areas. DPI confirmed that targeting is not reported, which is one reason for not putting much weight on CPUE in the weight-of-evidence approach, but both effort and catch have decreased considerably since their peak in the 1970s. Actual landed catch is also not a crucial determinant of stock status.</p> <p>It was noted that post-release mortality of Mulloway is relatively high for all methods and sectors and management options should consider ways to reduce capture, not just landings.</p> <p>It was recognised that reporting size and numbers of fish by a representative sample of commercial fishers as well as total tonnage could be - helpful, as would reporting of catch with size information by a representative sample of recreational fishers, perhaps through the existing mobile app.</p>
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Meeting 1 Part b 22 November 2021		
1.	Welcome and introductions	<p>1.1 Welcome and introduction The Chair opened by acknowledging Traditional Custodians.</p> <p>1.2 Apologies and recognition of observers No apologies were received and DPI observers were accepted.</p> <p>1.3 Confirmation of Agenda The Agenda for the meeting was accepted without modification.</p> <p>1.4 Declaration of Pecuniary Interests No updates were provided</p>
2.	Fishing for Mulloway	<p>The Chair opened a discussion for representatives to contribute their knowledge, experience, and perspective of fishing for Mulloway in NSW, so that all sectors/interests had a good appreciation of each other.</p> <p>Aboriginal fishing</p> <p>The 2016 census counted ca. 210,000 Aboriginal people in NSW with a large proportion on the coast. They often fish for whatever is available but there are several culturally iconic species. Fishing is usually in estuaries and within 3km of the coast. From evidence of Mulloway otoliths in middens we can conclude they have been harvested for thousands of years. Much fisheries management in NSW focuses on overlap of recreational and commercial interests, but Aboriginal fishing may also be commercial, if licensed, or recreational. Aboriginal fishers have provisions for double the recreational catch limits and can also fish as Native Title holders with rights potentially extending to commercial activity (e.g. Torres Strait Regional Sea Claim). There is an indigenous component of the National Recreational Fishing Survey but this is focussed on northern Australia. Numerical data by individual is quite low but there are better data by weight, though with much variability. There are some high catches by individuals supporting a larger number of people. The biggest concern would be not having enough Mulloway around to catch anymore.</p> <p>There is general use of coastal fish for celebrations like NAIDOC and Mulloway is always welcome. The <i>Fisheries Management Act 1994</i> (FMA) makes provision for catching more for special occasions, including sorry business, e.g. if an Elder passes away.</p> <p>The biggest problem for getting data is openness of communities: why data is needed and how it empowers communities must be explained; some like to keep it close, others are willing to share.</p>

		<p>Traditional methods of coastal fishing were hooks and lines and use of bays for baiting and trapping. Aboriginal fishers have always incorporated new thinking, so shouldn't have to use only traditional methods; they understand technology can lead to overfishing. There is cultural fishing under permit around Port Stephens, with some activity outside the permits.</p> <p>Commercial fishing</p> <p>Commercial catches of Mulloway peaked in the late 1970s; since then, fishing for Mulloway has reduced but remains crucial for businesses. Commercial fishing in Region 5 has concentrated on the Hawkesbury. Since the introduction of size limits and other management measures, some fishers exclusively targeting Mulloway have left. Catch has fallen but average size of fish has increased, potentially due to changes to use of larger mesh sizes. With reduced vessel days, the same grounds are being fished but it is essential to pick the right time, tide, and moon phase. There are good catches off beaches in the Hawkesbury with no apparent decline. Environmental factors such as winter slime can reduce catch rates. Wet years are needed for Mulloway to thrive, but acid sulphate soil is not good and wet years lead to red spot disease. Mesh size is also important, with 6-7" mesh generally used. Smaller mesh can catch smaller Mulloway but they can be avoided if targeting e.g. gummy shark.</p> <p>A key factor now is price, which can fall if there is a large catch being auctioned at the Sydney Fish Market. Price can be checked in the morning to decide how to fish that night. There used to be a price premium for mid-size fish, as the cross-section could be served on a dinner plate, but now larger fish often fetch the same price per kg. There is a price premium for line caught fish. It is often difficult to ensure constant supply, so buyers move on to other species.</p> <p>In commercial fishing for Mulloway, fish caught for sale are reported but discards are not. Research tag reporting is voluntary.</p> <p>Recreational fishing</p> <p>Mulloway are an iconic species for NSW recreational fishers. Many invest a lot in fishing for them and contribute to their management through funding stocking and research, as well as supporting catch-and-release and research tagging. Many other recreational fishers see them as an aspirational species that are highly valued when taken incidentally. The sector has been subject to various restrictions and there is no desire to increase the bag limit given the state of the stock. It is estimated that the</p>
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<p>3.</p>	<p>Fishery Description and Characterisation</p>	<p>DPI presented Working Paper WP-01-03.</p> <p>The most recent estimate of retained recreational harvest of Mulloway in NSW (2017–18) weighed an estimated 90 tonnes with a reported commercial catch of ~72 tonnes from the same period, noting commercial catch levels vary between years. Small numbers are also harvested in the NSW Charter Boat Fishery. It should be noted that these catch estimates pre-date the reduction of bag limit from 2 to 1 fish. Updated estimates will soon be available.</p> <p>Key recreational controls that are currently in place include:</p> <ul style="list-style-type: none"> • Minimum legal length of 70cm • Bag and possession limit of 1 Mulloway per person per day <p>Most reported commercial catch is from the Estuary General Fishery (~71%) followed by Ocean Trap and Line (~20%), Ocean Hauling (~8%), and Ocean Trawl (~1%). Mulloway are not permitted to be taken in other commercial fisheries (e.g. Estuary Prawn Trawl) or are simply not taken (e.g. Lobster Fishery).</p> <p>Commercial controls specific to Mulloway apply on a sector by sector basis; there are also industry-wide controls not necessarily specific to Mulloway, including:</p> <ul style="list-style-type: none"> • Limited numbers of fishers in each fishery/sub-sector • Limiting waters available to each fishery, sub-sector, gear type • Managing when certain gear may be used • Maximum boat length restrictions • Gear restrictions to improve selectivity for target species • Minimum legal length for some species (Mulloway is 70 cm) • Commercial bag or trip limits apply to some species • Individually transferable effort quotas apply in some fisheries • Individually transferrable catch quotas for some species <p>Discussion</p> <p>Potential use of the FisherMobile app to report numbers and size of catch and condition of discards was discussed. Live logging in</p>

		<p>the charter boat fishery would also be useful.</p> <p>Stocking of Mulloway could be very effective, although it can be expensive. Genetic techniques can be used to assess composition of the stock; data from George’s River shows 9% of Mulloway caught were from stocking.</p>
<p>4.</p>	<p>Fishing data for assessments</p>	<p>The independent scientist presented several points on the data available for stock assessment. Recognising there are better data now than in the past, there is still a need to understand if the data and assessment are sufficient (or could be improved) to support a robust harvest strategy.</p> <p>Current data have limitations, as DPI acknowledge. There is consensus that the Mulloway stock is depleted, but questions remain as to which fishing, where and when has the most impact, as well as the role of non-fishing impacts. The current DPI assessment depends on data from commercial fishing; improved data from the other sectors will be needed for a harvest strategy to operate effectively across sectors. Range restrictions and stock structure would affect the data and people may be correct in having different experiences of the stock in the water. With few data points for recreational catch, it is hard to reach strong conclusions; the Mulloway fishery may have collapsed or anglers could be releasing more. Fishing power has increased greatly for recreational fishers more so than commercial.</p> <p>Looking at fishing effort trends, the focus is on commercial days fished not total effective effort, with catch on some days <1kg, and potential mis-reporting of some commercial catch as Mullet rather than Mulloway. The ageing analyses are good but using these to estimate mortality is problematic. The models used for this were derived from elsewhere based on large fisheries with non-selective gear. The NSW Mulloway fishery is small by comparison, with no guarantee it’s one stock, every likelihood mixing is low, so any estimate from only one area could be biased. The assessment approach is sound but open to this bias: the data are probably from different populations of fish, the question is how different?</p> <p>Conclusion: The data must be improved to support a robust harvest strategy. The stock is most likely recruitment-impaired and fishing mortality may not be appropriately constrained by management such that the stock will recover.</p>

		<p>Discussion</p> <p>The Chair noted that while there may be sub-populations of Mulloway there is currently one management unit defined by managers.</p> <p>The current assessment shows how changes in management can lead to changes in fisher behaviour and/or catch data. The group agreed that, going forward, the data need to be good enough to know if the harvest strategy is working.</p>
5.	Harvest strategy support measures	<p>Despite lack of agreement from all groups, the Chair noted that the NSW DPI Assessment indicates that the stock is in poor shape. The DDG has asked the group to consider monitoring and management measures that could be implemented in the interim, while keeping faith with the Terms of Reference and ultimately supporting the harvest strategy. The Chair briefly presented a list of suggestions which will be discussed alongside any other suggestions at the next meeting, to be held as soon as possible.</p>
6.	Next steps	

Meeting 1 Part c 29 November 2021		
1.	Welcome and introductions	<p>1.1 Welcome and introduction</p> <p>The Chair opened by acknowledging the Traditional Custodians. No apologies were received; the following observers from DPI were accepted: Veronica Silberschneider, Rowan Chick, Ashley Fowler, Glenn Staples</p> <p>1.3 Confirmation of Agenda</p> <p>The Agenda for the meeting was accepted without modification.</p> <p>1.4 Declaration of Pecuniary Interests</p> <p>No updates were provided</p>
2.	Data improvement options for stock assessment	<p>DPI revisited key aspects of the stock assessment, emphasising that the weight-of-evidence approach considers key indicators, recognises any fundamental assumptions and uncertainties and identifies knowledge gaps. It is reviewed internally every year and externally every 2 years, The assessment considers all available data, with the weight of evidence for each data source determined by quality. Commercial catch and CPUE data are influenced by changes in targeting and other operations; the data are considered but the assessment is not dependent on effort data. The same is true for recreational catch data.</p> <p>Mulloway stocks could occur at smaller spatial scale: a recent tagging study led by the DPI scientist supports this hypothesis, with most recaptures within <10km and >80% in the same</p>

		<p>estuary. The rest do, however, move large distances (up to 355km). The spatial scale of assessment may require future investigation but SAFS assessment are done at the level of the biological stock.</p> <p>Conclusions: Evidence supports stock status being <i>Depleted</i> and recruitment-impaired. As per SAFS definition of <i>Depleted</i>, fishing mortality is currently constrained by management, which “may” allow stock to recover, but improvements are yet to be detected.</p> <p>Discussion</p> <p>It was confirmed that 4500 fish were tagged, with 700 (15%) re-captured and released by recreational and commercial fishers. Distance travelled depended on size of fish, time at liberty, and where they had been tagged. Seasonal trends in recaptures were expected but not seen in the data; also expected to see movement around spawning and the mullet run but this was not apparent. There was a bias to fish tagged and recaptured in estuaries, but fish tagged offshore were also caught close to where tagged.</p> <p>Better data would include spatially structured tissue/otolith sampling to confirm stock structure, increased spatial coverage of commercial catch, mesh size information for commercial nets, length data from recreational catch submitted through <i>FishSmart</i>, and better estimates of recreational and cultural fishing, discard rates and post-discard mortality. A fishery dependent or independent survey would be ideal from a scientific perspective.</p> <p>It was recognised that the assessment was as good as it could be given the data, noting the population is probably not homogeneous, with spatial variation in depletion likely to exist due to local factors, even if the population is genetically the same. It is also difficult to clarify probable causes of depletion.</p> <p>The commercial fishery is now opportunistic, with a decrease in number of endorsements but an increase in fishers who are able to use 6-inch mesh. It could be useful to conduct experimental fishing to characterise spatial variation and effects of mesh sizes.</p>
<p>3.</p>	<p>Harvest strategy support measures</p>	<p>The DDG has asked the group to provide advice on measures focussed on the <i>Depleted</i> stock status. The Chair presented some slides to stimulate discussion on the following themes:</p> <ul style="list-style-type: none"> • Strengthen Compliance • Improve Data Collection • Reduce Mortality • Restocking • Other

		<p>Discussion suggested that enforcement could be further prioritised, with increased media messaging and less tolerance of offences. This could include curtailing availability at points of illegal sale and educating in addition to targeting fishers. DPI confirmed that any information on illegal trade (including bartering) is welcome and handled in confidence.</p> <p>The group agreed that tagging catch and recording additional data such as mesh size, as well as numbers and lengths across all sectors, would be most useful. A mandatory approach would generate the best data set but a voluntary system could still generate valuable data. A staged approach could require mandatory reporting of numbers and lengths by commercial and charter boats in the first instance, which would be most cost-effective, with recreational fishers asked/required to report the same at a later date. Improved length data from commercial catch across all estuaries where landed would allow spatially structured analysis of spawning ratios, covering concerns about a non-homogeneous stock. This could lead on to collection of otoliths and genetic material for ageing analysis and close-kin studies. The purpose of any new reporting requirements should be clearly identified and communicated to fishers.</p> <p>Action</p> <p>Chair to draft advice to DDG on harvest strategy support measures and circulate this to the group before submission.</p> <p>DPI to present to the group on use of Bycatch Reduction Devices in prawn trawl nets to minimise bycatch of Mulloway.</p>
4.	FishPath	DPI gave an introductory presentation on the FishPath software, which they propose to use in upcoming HSWG meetings to help characterise the fishery and identify management options.

Next meeting: The group was scheduled to meet again on 1-2 March 2022. This meeting had to be postponed until 11-12 April, when these minutes were adopted.