RANKING BY THE MARINE AMATEUR FISHERIES WORKING GROUP (12 DECEMBER 2016) OF A REPORT BY SOUTHWICK ET AL ESTIMATING THE ECONOMIC CONTRIBUTION OF MARINE RECREATIONAL FISHING IN NEW ZEALAND

Context

The Research and Science Information Standard for New Zealand Fisheries (RSIS) specifies (pages 21-23) that the Ministry will implement processes to rank the quality of research and science information used in support of fisheries management decisions[1]. The quality ranking scores are:

- 1 – High Quality is accorded to information that has been subjected to rigorous science quality assurance and peer review processes as required by this Standard, and substantially meets the key principles for science information quality. Such information can confidently be accorded a high weight in fisheries management decisions.
- 2 – Medium or Mixed Quality is accorded to information that has been subjected to some level of peer review against the requirements of the Standard and has been found to have some shortcomings with regard to the key principles for science information quality, but is still useful for informing management decisions. Such information is of moderate or mixed quality, and will be accompanied by a report describing its shortcomings.
- 3 – Low Quality is accorded to information that has been subjected to peer review against the requirements of the Standard but has substantially failed to meet the key principles for science information quality. Such information is of low quality and should not be used to inform management decisions. Where it is nevertheless decided to present such low quality information in fisheries management decisions, the quality shortcomings of the information should be reported and appropriate caution should be applied.

Ranking of the project needs to occur explicitly. Each of the **P**eer Review, **R**elevance, **I**ntegrity, **O**bjectivity and **R**eliability (PRIOR) criteria should be considered. Scoring should generally occur on a 'by exceptions basis'. Thus, it is not necessary to score each of the criteria, although all should be explicitly considered. Scoring of a 1 does not require detailed justification. Scoring other than a 1 will require justification, including what if any remedial action may be required to improve the score. Uncertainty, inherent in many fisheries science outputs, should not of itself be used as a reason to score down a project unless it has not been properly considered / estimated or of the uncertainty is so large as the render the results and conclusions meaningless.

Practice and scoring by MAFWG

MAFWG ranks all final research presentations, typically "by exception" as described above, in a process led by the Chair. The ranking is designed to evaluate whether the research is "fit for purpose". Given that precise rules for grading under all circumstances and for all "purposes" are not possible and, in order to keep discussions brief, the Chair, after making their provisional views known, explores with the MAFWG whether there are substantive negative responses to any of the following five questions stemming from the PRIOR principles:

[1] In the RSIS, the phrase "fisheries management decisions" is interpreted broadly and used as shorthand for "fisheries management decisions, the development of environmental standards and the formulation of relevant fisheries policy"

1. Has the work been adequately peer reviewed?
2. Is the work relevant to fisheries management questions and potential fisheries management decisions?
3. Has the integrity of the data and analyses been maintained throughout the duration of the scientific study, so far as can be determined?
4. Are the data, analyses, results, and conclusions objective and unbiased, to the extent possible?
5. Are the analyses, results, and conclusions reliable in the sense that:
    a. Uncertainty has been appropriately described and is not so large as to render the results and conclusions meaningless, and
    b. A reasonable range of alternative hypotheses (or sensitivities) has been adequately explored and considered?

Scoring for the report by Southwick et al (2016)

On 12 December 2016, the MAFWG considered the final version of the report by Southwick et al (2016), drafts of which it had considered at its meetings of 13 May and 19 August. The purpose of the work had been made clear verbally at the meeting of 19 August[2], when MAFWG considered that additional text was required in the report to make the purpose explicit. It was after considering this additional context and caveats (plus some extra methodological detail) in this final version that the Chair led the working group through an explicit consideration of each of the five questions relating to the PRIOR principles. The responses are as follows:

- **Has the work been adequately peer reviewed?**

Yes, the working group agreed that, although the methods and assumptions were not all completely specified and this had complicated review, the work has been extensively reviewed through:

- two preparatory meetings of research advisory groups,
- three meetings of the MAFWG proper (including participants with economics expertise),
- two independent written reviews commission by MPI, and
- two sets of written comments commissioned by fishing industry bodies.

- **Is the work relevant to fisheries management questions and potential fisheries management decisions?**

Yes, the working group agreed that the work was relevant to fisheries management questions and potential fisheries management decisions as these are (broadly) interpreted in the RSIS.

[2] The stated intent of the study in version of the report considered on 12 December 2016 was to estimate the economic contribution of recreational fishers in New Zealand which included annual expenditure, total economic output, value added (GDP), employment, income and tax revenues. This is effectively a snap shot of the economic activity associated with marine recreational fishing in 2014-15. This type of study is used to help understand the general size, nature and importance across the national economy. It cannot estimate the shrinkage in the economy if recreational fishing did not exist. This study did not set out to estimate the consumer surplus, which is the value fishers derive over and above what they spend.

The estimates of expenditure and downstream economic effects are considered relevant at a high level but not useful for individual decisions on allocation.

- **Has the integrity of the data and analyses been maintained throughout the duration of the scientific study, so far as can be determined?**

Yes, the working group agreed that, so far as can be determined, integrity of the data and analyses had been maintained.

- **Are the data, analyses, results, and conclusions objective and unbiased, to the extent possible?**

The working group considered that the analyses, results, and conclusions may be objective and unbiased, but noted the following issues with the documentation:

- The methods and assumptions were not all completely and precisely described in the report such that another researcher could easily repeat the work,
- The report did not include information like tables of scalars and weightings used to develop the estimates of expenditure and, especially, estimates of downstream effects
- The lack of detail described above made it difficult to be completely sure that the analysis was objective and unbiased, and
- The approach chosen to build on the National Panel Survey to estimate expenditure using the Horizon survey has inherent but unmeasured potential biases associated with self-selection and recall.

- **Are the analyses, results, and conclusions reliable in the sense that:**
    a. **Uncertainty has been appropriately described and is not so large as to render the results and conclusions meaningless, and**
    b. **A reasonable range of alternative hypotheses (or sensitivities) has been adequately explored and considered?**

The working group considered that the analyses, results, and conclusions may be reliable, but noted the following issues with the assessment of uncertainty:

- Confidence limits were calculated and presented for some important input quantities but not propagated through to the final estimates of expenditure,
- Estimates of expenditure appeared to be reasonably well-founded but expanding these to estimates of downstream effects or economic contribution involved more assumptions that were not well-described and may be less well-founded, and
- In common with some other economic assessments, uncertainty associated with the estimates of expenditure and economic contribution was undoubtedly greater than the confidence intervals presented but this was not discussed in detail in the report.

Based on these considerations, the study reported by Southwick et al (2016) is graded as a 2, Medium or Mixed Quality. In other words, the report has been found to have some shortcomings and limitations with regard to the key principles for science information quality, but is still useful for informing fisheries management decisions, the development of environmental standards or the formulation of relevant fisheries policy at a high level. The key limitations and shortcomings are as follows:

- The estimates of expenditure and downstream economic effects are relevant at a high level but not useful for individual decisions on allocation,
- The methods and assumptions were not all completely and precisely described in the report such that another researcher could easily repeat the work,
- The report did not include information like tables of scalars and weightings used to develop the estimates of expenditure and, especially, estimates of downstream effects,
- The lack of detail described above made it difficult to be completely sure that the analysis was objective and unbiased,
- The approach chosen to build on the National Panel Survey to estimate expenditure using the Horizon survey has inherent but unmeasured potential biases associated with self-selection and recall,
- Confidence limits were calculated and presented for some important input quantities but not propagated through to the final estimates of expenditure,
- Estimates of expenditure appeared to be reasonably well-founded but expanding these to estimates of downstream effects or economic contribution involved more assumptions that were not well-described and may be less well-founded, and
- In common with some other economic assessments, uncertainty associated with the estimates of expenditure and economic contribution was undoubtedly greater than the confidence intervals presented but this was not discussed in detail in the report.

Martin Cryer, Chair MAFWG, 13 December 2016.