Advice to the Minister for Sustainability, Environment, Water, Population and Communities from the Threatened Species Scientific Committee (the Committee) on Amendment to the list of Threatened Species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

1. Name

Thunnus maccoyii

The species is commonly known as Southern Bluefin Tuna.

2. Reason for Conservation Assessment by the Committee

This advice follows assessment of information provided by a public nomination to list Southern Bluefin Tuna. The nominator suggested listing in the conservation dependent category of the list.

Southern Bluefin Tuna is listed as endangered under the NSW *Fisheries Management Act 1994* and as threatened under the Victorian *Flora and Fauna Guarantee Act 1988*. The Committee provides the following assessment of the appropriateness of the species' inclusion in the EPBC Act list of threatened species.

This is the Committee's second consideration of the species under the EPBC Act. The Committee previously considered this species in 2005, at which time it found that Southern Bluefin Tuna was eligible for listing as endangered, but recognised that listing in that category may have been detrimental to the survival of the species at that time.

3. Summary of Conclusion

The Committee judges that the species has been demonstrated to have met sufficient elements of Criterion 1 to make it eligible for listing as **critically endangered**, and has also been demonstrated to have met the requirements of section 179(6)(b) of the EPBC Act to be eligible for listing as **conservation dependent**.

The Committee judges that the most appropriate category of listing for Southern Bluefin Tuna is **conservation dependent**.

4. Taxonomy

The species is conventionally accepted as *Thunnus maccoyii* (Castelnau, 1872) (Southern Bluefin Tuna).

5. Description

Southern Bluefin Tuna (SBT) is one of 13 species of tuna in the Family Scombridae. SBT are long and muscular fish, with a fusiform and rounded body that is nearly circular in cross section. SBT are dark blue to black on the dorsal surface and silvery white on the lower sides and belly, with small scales covering the skin. There are two dorsal fins, the first dorsal fin is yellow or bluish, the anal fin and the finlets are dusky yellow edged with black. Keels are present near the tail and are coloured yellow in adults (Carpenter and Niem, 2001).

SBT can grow to 225 cm in length and 200 kg in weight, however, adults are more commonly recorded at around 160 cm (Carpenter and Niem, 2001; Phillips et al., 2009). Length-weight

correlations are variable in adult fish, depending on physiological conditions (Collette and Nauen, 1983). Juvenile SBT recruit to the aggregations of adults that are fished at 9-12 months of age, at lengths around 55 cm and weighing around 3.5 kg (Phillips et al., 2009).

6. National Context

SBT is a highly migratory species that occurs globally in waters between 30°S and 50°S, though is mainly found in the eastern Indian Ocean and in the south western Pacific Ocean (CCSBT, 2009a).

In Australian waters, SBT ranges from northern Western Australia, around the southern region of the continent, to northern New South Wales. The southernmost portion of the spawning ground lies within Australia's Exclusive Economic Zone (Phillips and Findlay, 2008).

National fisheries context

Juvenile SBT are targeted in the Great Australian Bight by Australian purse seine fishing vessels and towed to Port Lincoln where they are transferred to grow-out cages and fed intensively for 6-8 months before being harvested and exported to Japan. At the time of capture, these juvenile fish are predominantly in the two to three year age class, with small numbers of one and four year old fish (Phillips et al., 2009). More than 95% of Australia's total catch of SBT is taken by this method.

Throughout the rest of its global range, SBT is targeted by pelagic longliners, including domestic longliners operating along the Australian east coast. Longliners harvest fish from all age classes, from juveniles about three years old to adults over 12 years old (Phillips et al., 2009).

International fisheries context

The assessment of the conservation status of SBT within the Australian jurisdiction cannot be meaningfully separated from an assessment of the global status. SBT is comprised of one single global population (stock), therefore an Australian population cannot be isolated for consideration.

SBT is fished by many nations, with Japan, Australia, New Zealand, the Republic of Korea, Taiwan and Indonesia identified as the major nations catching SBT commercially. Given the highly migratory nature of the single SBT stock, cooperative management of SBT is undertaken between these countries through the forum of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT). The CCSBT is an international consensus-based organisation that sets national allocations of Total Allowable Catch (TAC) for Member countries, as well as prescribing additional management measures that must be adhered to by Members.

In addition to allocating TAC to Member countries, the CCSBT also allocates a portion of the global catch of SBT to Co-operating Non-Member countries. These are nations with developing fisheries, such as South Africa, the Philippines and the European Union (particularly Spain).

Australia's position within the CCSBT is negotiated primarily by the Department of Agriculture, Fisheries and Forestry, with support from other agencies, independent Australian scientists, fishing industry representatives and non-government organisations. Once the

national allocations are agreed in CSSBT, the day to day management of Australia's share of the global catch is managed by the Australian Fisheries Management Authority (AFMA) through the *Southern Bluefin Tuna Management Plan 1995* (DAFF, 1995), having regard to the management measures negotiated within the CCSBT.

The CCSBT was first established in 1994 in response to concerns about the status of SBT, when signs of overfishing became apparent in the 1980s. In 2009, a stock assessment undertaken by the Scientific Committee of the CCSBT estimated that the spawning stock biomass was at a very low level, typically around 5% or less of unfished levels (CCSBT, 2009b). This stock assessment was accepted by the CCBST in 2009, resulting in agreement by all Members to reduce the TAC and tighten monitoring and compliance measures to ensure the enforcement of the reduction in targeted catch (CCSBT, 2009a). These international management measures are documented in the *Resolution on the Total Allowable Catch and Future Management of Southern Bluefin Tuna* of the 16th meeting of the Extended CCSBT (CCSBT, 2009a). These measures are binding on all Members, including Australia.

7. Relevant Biology/Ecology

SBT forms a single widely distributed population in the southern, temperate oceans, but with a single known spawning ground in the Indian Ocean, between Java and northern Western Australia. Individuals reach sexual maturity at around 12 years and live for 40+ years (Phillips et al, 2009). Generation length for the species has been estimated to be 16-18 years.

It is not known whether all mature SBT spawn each year, but a single female can release up to 15 million eggs during a spawning period (Collette and Nauen, 1983). Spawning takes place from September to April in warm waters south of Java and juvenile SBT then migrate down the coast of Western Australia (CCSBT, 2009a). Surface schooling juvenile SBT are found in coastal waters off southern Australia during the summer months (December to April) and spend winters in deeper, temperate oceanic waters (Bestley et al., 2008; CCSBT, 2009a; Phillips et al., 2009). Young SBT are known to migrate seasonally between the south coast of Australia and the central Indian Ocean (CCSBT, 2009a). After attaining five years of age, SBT are seldom found in nearshore surface areas, and their distribution extends over the southern circumpolar area throughout the Pacific, Indian and Atlantic Oceans (CCSBT, 2009a).

SBT are known to be among the fastest ocean swimmers in the world, and can travel in speed bursts of up to 70 km/hr while feeding. SBT tend to school to feed, and are carnivorous, feeding opportunistically on fish, squid, krill and salps (Carpenter and Niem, 2001). SBT are considered to be high-level predators in the marine environment.

8. Description of Threats

The main threat to SBT is historic and ongoing fishing pressure. The market for SBT is highly lucrative and the species is targeted by fishing fleets from a number of nations, both on the high seas and in the Exclusive Economic Zones of Australia, New Zealand, Indonesia and South Africa.

Commercial fishing for SBT began off south-eastern Australia in the 1930s. The species was heavily fished in the 1950s and 1960s, predominantly by Japanese vessels, with the annual global catch of SBT peaking at over 81 000 t in the early 1960s. Heavy fishing continued into the 1970s, with clear signs that the stock was overfished becoming evident in the early 1980s

(Phillips et al., 2009). A graph of the global catch of SBT from 1952 to 2007 is provided at Figure 1.

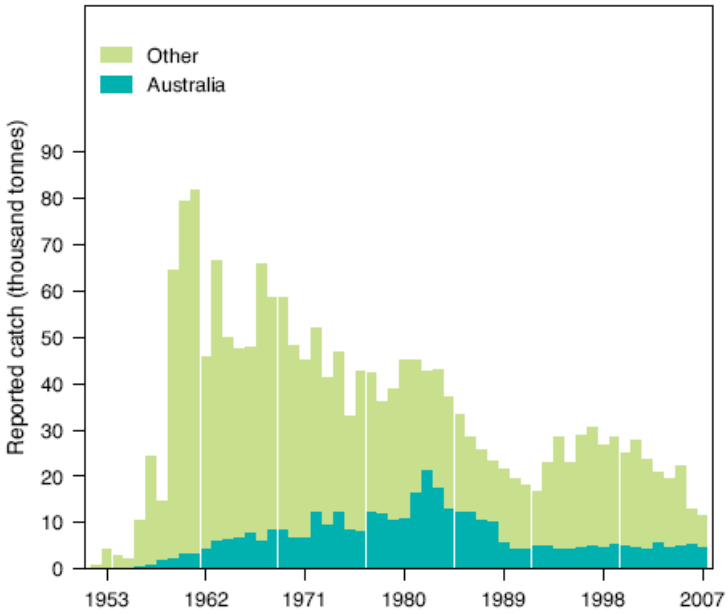

Figure 1. Southern bluefin tuna catch history (reported global), 1952 to 2007 (Phillips et al., 2009). NOTE: Total global catches exceeded reported global catches over 1985–2005. Some scientists estimate unreported catches to have surpassed 178 000 t over this period (Polachek and Davies, 2008).

As noted above, the Scientific Committee of the CCSBT completed a revised stock assessment of SBT in 2009 (CCSBT, 2009a). This assessment estimated that the spawning stock biomass of SBT was at around 5% or less of unfished levels. The stock assessment also indicated a general decline in recruitment since about 1970, coincident with declining spawning stock sizes. There were four particularly poor recruitment years from 1999 to 2002, and indications of some further poor recruitment after 2004, which will lead to a further decline in spawning stock biomass (CCSBT, 2009b).

On the basis of the findings of the stock assessment, the Scientific Committee of the CCSBT recommended that the CCSBT implement a meaningful reduction in catch immediately (CCSBT, 2009b). No other key threats aside from overfishing were identified.

9. Public Consultation

The nomination was made available for public exhibition and comment for 30 business days. No public comments were received.

10. How judged by the Committee in relation to the criteria of the EPBC Act and Regulations

The Committee judges that the species is **eligible** for listing as **critically endangered** and as **conservation dependent** under the EPBC Act. The assessment against the criteria is as follows:

Criterion 1: It has undergone, is suspected to have undergone or is likely to undergo in the immediate future a very severe, severe or substantial reduction in numbers

SBT appears to have undergone a very severe reduction in numbers as a result of heavy fishing pressure throughout its range. SBT is formed of one single global stock, so the reduction in numbers is apparent in the proportion of the SBT stock that migrates through Australian waters.

This decline is reflected in the 2009 stock assessment undertaken by the Scientific Committee of the CCSBT (CCSBT, 2009b). The estimated trajectories of spawning stock biomass for the fishery are given in Figure 2. This shows a continuous decline from the late 1950s to the late 1970s, then a short period of stabilisation followed by a further decline from the early 1980s to mid 1990s to a very low level. The spawning stock biomass is estimated to have remained at this low level with relatively small annual variation until the early 2000s. A decline in the median spawning stock biomass is evident from 2002 and there was no evidence in 2009 of the spawning stock rebuilding.

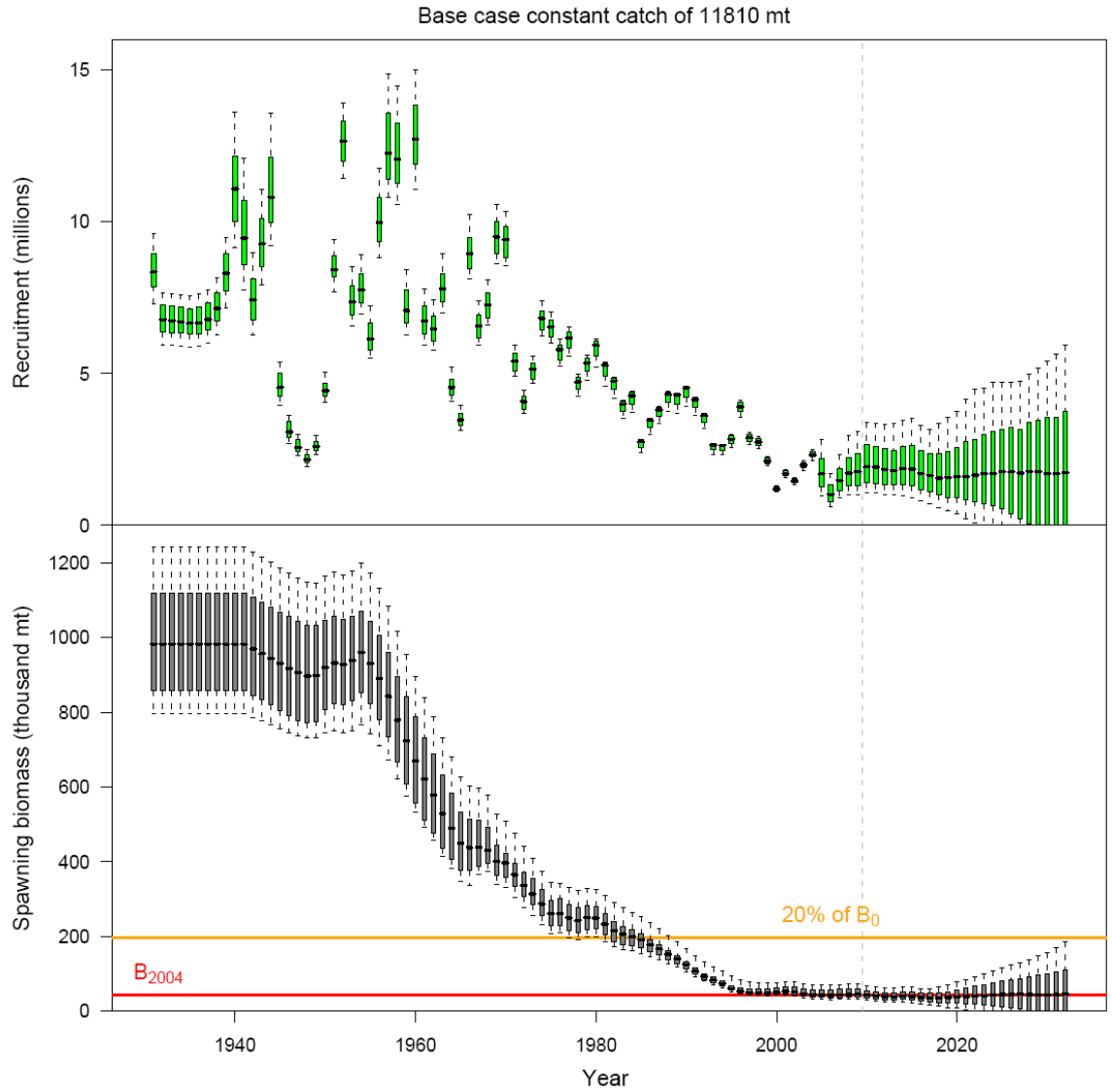

Figure 2. Recruitment and spawning stock biomass for the base case stock assessment scenario, showing the medians, quartiles and 90th percentiles, together with reference points of 20% of original spawning stock biomass (SSB_0) and the spawning stock biomass in 2004 (SSB_{2004}). Projections of future spawning stock biomass and recruitments commence at the dashed vertical line assuming a constant catch equal to the 2009 TAC (11,810t) (CCSBT, 2009b).

This stock assessment further estimated that the spawning stock biomass in 2009 was at around 5% of unfished levels, with a 90% probability that the spawning stock was between 3-8% of unfished levels (CCSBT, 2009b). The stock appears to have been at very low levels since the late 1990s (CCSBT, 2009b). This stock assessment therefore indicates that SBT

may have declined by over 90% between the late 1950s and the mid 1990s, over approximately 40 years.

The Commonwealth Fisheries Harvest Strategy Policy (DAFF, 2007) allows that declines of up to 60% are acceptable for a commercially harvested species where depletion is a managed outcome, depending on the biology of the species. The Harvest Strategy Policy does not apply to SBT, as it is an internationally managed fishery (Phillips et al., 2009), however, the Committee has used the rationale of the Harvest Strategy Policy as a general guide for appropriate reference points for fished stocks. The Committee notes, however, that SBT is estimated to have experienced a decline of over 90% between the late 1950s and the mid 1990s and has remained at very low levels since. This decline has occurred within three generations of SBT and the Committee considers it to be very severe.

Resolution of the 16th meeting of the CCSBT

Following its acceptance of the 2009 stock assessment, the 16th meeting of the CCSBT agreed to reduce the global TAC of SBT by 20% over the following two years and to implement stronger compliance and enforcement measures, to ensure the reduction is achieved.

This global reduction in TAC was accompanied by a commitment to develop a Management Procedure in 2010 for implementation in 2011. The Management Procedure will identify decision rules and recovery targets and timeframes (similar to an Australian harvest strategy) and will provide the basis for setting the global TAC in 2012 and beyond, with the objective of rebuilding SBT to 20% of the original spawning biomass as an interim target. The CCSBT further agreed that if this Management Procedure is not finalised by 2012, the global TAC will be further reduced to 50% of 2009 levels.

These measures are documented in the *Resolution on the Total Allowable Catch and Future Management of Southern Bluefin Tuna* of the 16th meeting of the Extended CCSBT (the Resolution) (CCSBT, 2009a).

The Committee has evaluated the measures outlined in the Resolution and considered how these will be enacted in Australian waters through the *Southern Bluefin Tuna Management Plan 1995* and through Australia's obligations to the CCSBT. The Committee notes the stock trajectories predicted on the basis of these measures (Figure 3) and considers that they could be effective in supporting the recovery of SBT.

The Committee also notes that regular stock assessments of SBT are ongoing and will be used to inform the Management Procedure and future management decisions. The Committee supports this practise to ensure adaptive management of fishing effort that is likely to impact on SBT in the future.

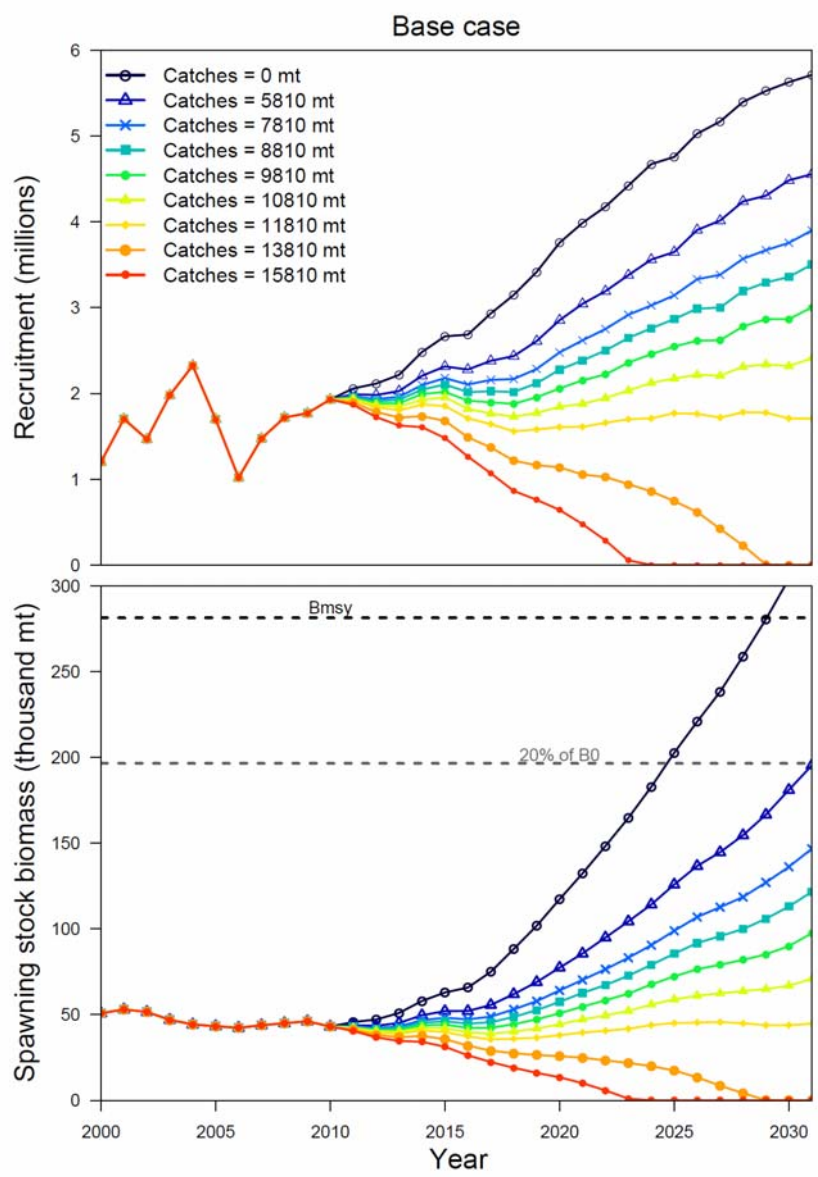

Figure 3. Median recruitment and spawning stock biomass for the base case projected for a variety of levels of constant catches. These projections were estimated before CCSBT16. Following CCSBT16, the 9 810 t projection most closely represents the agreed TAC for 2010 and 2011. Median recruitment from 2000-2008 was based on estimates of the abundance of year classes that had already entered the stock. Estimates of median recruitment beyond 2008 were estimated using the model stock-recruitment relationship and assume that this relationship holds for future levels of spawning stock biomass. Consequently, estimates of future recruitment are more uncertain (CCSBT, 2009b).

Conclusion

The Committee accepts that there has been a decline of over 90% in SBT between the late 1950s and the mid 1990s and that the stock remains at very low levels. The Committee considers that this decline is very severe. Therefore, the Committee considers that the species has been demonstrated to have met sufficient elements of Criterion 1 to make it **eligible** for listing as **critically endangered**.

However, the Committee notes that given the highly migratory nature of the SBT stock, the best chance for maximizing the recovery of the species remains with a globally coordinated management strategy that is supported by Australia. The Committee has evaluated the measures outlined in the Resolution and considers that they could be effective in halting further decline and supporting the recovery of SBT in order to maximize its chance of

survival in nature. Therefore, SBT has also met the requirements of section 179 of the EPBC Act to make it **eligible** for listing as **conservation dependent**.

Criterion 2: Its geographic distribution is precarious for the survival of the species and is very restricted, restricted or limited

SBT is a highly migratory species and is found around the globe in waters between 30°S and 50°S. In Australian waters, SBT ranges from northern New South Wales, around the southern region of the continent, to northern Western Australia. The range and habitat available to adult SBT is not considered to be precarious for the survival of the species nor is it limited.

The spawning habitat for SBT is confined to a single known spawning ground in the Indian Ocean, in waters between northern Western Australia and Java, from approximately 7°S to 20°S and 105°E to 120° E (which covers over one million square kilometres in extent). While this is a relatively contained area for spawning compared to other pelagic tuna species, it is not considered to be limited for the purposes of this criterion.

Therefore, as the species has not been demonstrated to have met the required elements of Criterion 2, it is **not eligible** for listing in any category under this criterion.

Criterion 3: The estimated total number of mature individuals is limited to a particular degree; and either

(a) evidence suggests that the number will continue to decline at a particular rate; or

(b) the number is likely to continue to decline and its geographic distribution is precarious for its survival

The 2009 stock assessment estimated that there were around 460 000 mature individuals of SBT. Following the reductions in catch agreed by CCSBT in 2009, the stock trajectory calculated by this assessment based on the reductions in catch predicts that numbers should increase (CCSBT, 2009b). Future stock assessments will provide further updates on stock trajectory. The Committee does not consider that the 2009 stock assessment represents a limited number of mature individuals. Therefore, as the species has not been demonstrated to have met this required element of Criterion 3, it is **not eligible** for listing in any category under this criterion.

Criterion 4: The estimated total number of mature individuals is extremely low, very low or low

The 2009 stock assessment estimated that there were around 460 000 mature individuals of SBT. Following the reductions in catch agreed by CCSBT in 2009, the stock trajectory calculated by this assessment based on the reductions in catch predicts that numbers should increase (CCSBT, 2009b). Future stock assessments will provide further updates on stock trajectory. The Committee does not consider that the 2009 stock assessment represents a limited number of mature individuals. Therefore, as the species has not been demonstrated to have met this required element of Criterion 4, it is **not eligible** for listing in any category under this criterion.

Criterion 5: Probability of extinction in the wild that is at least

(a) 50% in the immediate future; or

(b) 20% in the near future; or

(c) 10% in the medium-term future

Based on the stock trajectory estimated in the 2009 stock assessment (CCSBT, 2009b), the Committee does not consider that SBT is at risk of extinction in the wild, provided the reductions in global catch are adhered to and management measures identified in the *Resolution* are enforced. Therefore, as the species has not been demonstrated to have met the required elements of Criterion 5, it is **not eligible** for listing in any category under this criterion.

11. CONCLUSION

Conservation Status

Thunnus maccoyii (Southern Bluefin Tuna) (SBT) was nominated for inclusion in the list of threatened species referred to in section 178 of the EPBC Act. The nominator suggested listing in the conservation dependent category of the list.

The Committee accepts that there has been a decline of over 90% of SBT, following overfishing. This decline occurred between the late 1950s and the mid 1990s and the stock has remained at very low levels since. A decline of this magnitude within this timeframe is considered very severe for this species and demonstrates that SBT has met sufficient elements of Criterion 1 to make it eligible for listing as **critically endangered**.

However, Committee notes that given the highly migratory nature of the SBT stock, the best chance for maximizing the recovery of the species remains with a globally coordinated management strategy that is supported by Australia.

The Committee has evaluated the measures outlined in the *Resolution on the Total Allowable Catch and Future Management of Southern Bluefin Tuna* of the 16th meeting of the Extended CCSBT and considers that they could be effective in halting further decline and supporting the recovery of SBT in order to maximise its chance of survival in nature. Therefore, the Committee judges that SBT has also been demonstrated to have met the requirements of section 179(6)(b) of the EPBC Act to be eligible for listing as conservation dependent, with the requirement that the stock trajectory of SBT be closely monitored and reported to the Committee on an annual basis, and that the Committee be updated on the development and adoption of the CCSBT Management Procedure which will provide for management of SBT into the future. The Committee further requires that these annual updates include report of Australia's progress against its obligations to CCSBT, including measures to improve monitoring of commercial and recreational catch.

The Committee notes that improved conservation outcomes could be achieved through listing in the conservation dependent category. The Committee's reasoning for this conclusion is that listing as conservation dependent obliges the implementation of management and monitoring regimes that are now in place and indicates that its recommendation is contingent on these actions. The Committee therefore judges that **conservation dependent** is an appropriate category for SBT.

Recovery Plan

The Committee considers that there should not be a recovery plan for this species, as conservation actions are already being undertaken through other fisheries management plans.

12. Recommendations

(i) The Committee recommends that the list referred to in section 178 of the EPBC Act be amended by **including** in the list in the **conservation dependent** category:

Thunnus maccoyii

(ii) The Committee recommends that there should not be a recovery plan for this species but that existing international arrangements be diligently implemented.

Associate Professor Robert J.S. Beeton *AM FEIANZ*

Chair

Threatened Species Scientific Committee

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