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**EXPLANATORY NOTE FOR A DRAFT RECOMMENDATION BY ICCAT ON THE BY-CATCH OF SEA
TURTLES CAUGHT IN ASSOCIATION WITH ICCAT FISHERIES
(combine, streamline, and amend Recommendations 10-09 and 13-11)**

(previously discussed but not adopted as PA4-812C/2019)

(Proposal submitted by Belize, Nicaragua, and the United States)

This proposal from Belize, Nicaragua, and the United States would streamline existing ICCAT sea turtle bycatch requirements, as recommended by the Performance Review Panel and endorsed by Panel 4 in 2018. It also includes a number of options to further reduce bycatch and increase post-release survival of sea turtles, all of which are consistent with the requirements adopted by the Inter-American Tropical Tuna Commission (IATTC) and the Western and Central Pacific Fisheries Commission (WCPFC) as well as SCRS advice, namely: (1) use of large circle hooks; (2) use of finfish bait; or (3) other measures considered effective by the SCRS.

Recommendations 10-09 and 13-11 recognized that ICCAT fisheries can negatively affect sea turtles and that there is a need to implement measures to mitigate those effects. In response to a request from the Commission, the SCRS worked for several years to apply a robust methodology to estimate the number of sea turtle interactions with ICCAT longline fisheries and to develop advice on how to mitigate these impacts. In 2017, the SCRS estimated that tens of thousands of sea turtles are caught every year by ICCAT longline fisheries. Further, a 2018 report by the Wider Caribbean Sea Turtle Conservation Network,¹ which is composed of scientists from 19 countries (including these ICCAT CPCs – United States, Canada, Venezuela, UK/British Virgin Islands, and Trinidad and Tobago) found that regional, abundance-weighted trends for Northwest Atlantic leatherback turtles showed population declines across temporal scenarios despite a previous (2013) IUCN Red List assessment indicating that the population was abundant with stable and even increasing trends. Threats from fisheries have been well-documented for leatherback turtles throughout their range, including the high seas, coastal foraging areas, and off key nesting beaches.

The SCRS acknowledged in its 2017 report that large circle hooks and finfish bait are proven to be effective in reducing sea turtle bycatch and may increase post-release survival, consistent with a study presented at the SCRS which found that capture probabilities for leatherback turtles in the Atlantic are lower using large circle hooks compared to J hooks, and using finfish bait compared to squid bait.² The SCRS concluded in its 2018 report that declines in leatherback and loggerhead interaction rates in the northwest Atlantic since 2004 are consistent with the implementation of gear changes (large circle hooks and the use of finfish bait) designed to reduce incidental captures. Taking into consideration the above scientific information, and that most sea turtle bycatch occurs on shallow-set longlines, the SCRS recommended that the Commission consider adopting for shallow-set longline fisheries at least one of the following mitigation measures to reduce sea turtle interactions and bycatch: (1) use of large circle hooks; (2) use of finfish bait; or (3) other measures considered effective by the SCRS. In 2019, the SCRS Sub-Committee on Ecosystems and Bycatch (SC-ECO) noted that recent experimental and meta-data analyses continue to indicate that large circle hooks are an effective measure in reducing sea turtle bycatch and could also increase post-release survival of sea turtles. In its 2021 report, the SCRS continued to recommend that the Commission adopt the use of large circle hooks for shallow-set longlines.

Notably, the independent Panel that conducted the Second ICCAT Performance Review supported previous SCRS advice that the Commission adopt measures on the use of circle hooks to mitigate sea turtle bycatch, which would also have conservation benefits for overfished blue marlin and white marlin stocks. The SCRS noted in its 2019 report that research has demonstrated that in some longline fisheries, the use of circle hooks has resulted in a reduction of billfish mortality. At its 2018 meeting, Panel 4 supported this Performance Review recommendation and, to further streamline sea turtle reporting requirements, agreed

¹ Northwest Atlantic Leatherback Working Group. 2018. Northwest Atlantic Leatherback Turtle (*Dermochelys coriacea*) Status Assessment (Bryan Wallace and Karen Eckert, Compilers and Editors). Conservation Science Partners and the Wider Caribbean Sea Turtle Conservation Network (WIDECASST). WIDECASST Technical Report No. 16. Godfrey, Illinois. 36 pp.

² Swimmer, Y., A. Gutierrez, K. Bigelow, C. Barcelo, B. Schroeder, K. Keene, K. Shattenkirk, and D.G. Foster. 2017. Sea turtle by-catch mitigation in U.S. longline fisheries. *Frontiers in Marine Science* 4:1-19.

that Recommendation 10-09 and Recommendation 13-11 should be consolidated when considering the adoption of measures to minimize sea turtle bycatch mortality.

Some concern has been expressed that circle hooks may increase shark catch rates, however, these apparent increases may be confounded by other factors. Many studies have found that a higher percentage of sharks are hooked externally (i.e., in the mouth or jaw) on circle hooks as compared to J-hooks, which are more likely to lodge internally (i.e., in the throat, esophagus, or gut).³ The elevated risk of being hooked internally due to J-hook use is theorized to contribute to the moderate increases in catch rates associated with circle hooks, as sharks captured on J-hooks can easily bite off the leader and evade capture.⁴ While these sharks evade capture, they likely experience some level of cryptic mortality. A major conservation benefit associated with circle hook use for sharks is the decreased rate of at-vessel mortality, both on a combined and species level (including shortfin mako sharks).^{5,6} As circle hooks result in less injury to sharks, the release condition of the animals is also improved, which likely contributes to decreased rates of post-release mortality.

Multiple SCRS papers presented to SC-ECO have detailed results from meta-analyses on the retention and at-vessel mortality rates for sea turtles, bony fishes, and elasmobranchs that compared different hook, bait, and leader types in the surface pelagic longline fishery. The SCRS, in reviewing these studies, noted that, although catch rates using circle hooks were reported in some studies to be higher for sharks, this could be due to fewer bite-offs, as described above. In 2019, the SCRS further noted that, with regard to shortfin mako sharks, studies have shown that when using circle hooks, the retention rate would increase, but at-haulback mortality would decrease compared to J-hooks. The SCRS recently clarified its earlier conclusion that retention rates would significantly increase was incorrect, however. A recent SCRS paper (SCRS/2021/072) presented to the SC-ECO in 2021 demonstrated that the meta-analyses which documented significantly higher catch rates on circle hooks for shortfin mako sharks contained data treatment and statistical errors, leading to a spurious interpretation of the data and inaccurate statistical models. After correcting these confounding effects, the updated statistical models demonstrated that for shortfin mako sharks, there is no significant difference in catch rates due to hook type. Furthermore, the use of circle hooks leads to a *~10% reduction in at-vessel mortality* of shortfin mako sharks relative to J-hooks.

In 2018 and 2019, after acknowledging similar concerns for sea turtles and undeniable studies that show the effectiveness of the aforementioned measures, other tuna-RFMOs (the WCPFC and IATTC) adopted new sea turtle bycatch mitigation measures. These measures address reducing interactions with sea turtles and mitigating impacts of interactions that may occur. Many ICCAT CPCs are also members of those RFMOs and facilitated adoption in those fora. The next logical and needed step to further the conservation of severely depleted sea turtles in the Atlantic is to adopt consistent measures in ICCAT.

The Commission asked the SCRS to provide more information on this matter as early as 2010, and that scientific advice became available in 2017 along with advice on how to help mitigate these impacts. Despite the 2017 SCRS advice and resulting proposals advanced by several CPCs in 2017, 2018, and 2019, the Commission has yet to take action to further mitigate sea turtle bycatch. In response to this advice from the SCRS, the dire status of sea turtles in our oceans, and similar efforts being made in related RFMOs, the Commission should take immediate action on this matter.

³ Gilman, E., M. Chaloupka, Y. Swimmer, and S. Piovano. 2016. A cross-taxa assessment of pelagic longline by-catch mitigation measures: conflicts and mutual benefits to elasmobranchs. *Fish and Fisheries* 17:748-784.

⁴ Afonso, A.S., R. Santiago, H. Hazin, and F.H.V. Hazin. 2012. Shark bycatch and mortality and hook bite-offs in pelagic longlines: interactions between hook types and leader materials. *Fisheries Research* 131-133:9-14.

⁵ Godin, A.C., J.K. Carlson, and V. Burgener. 2012. The effect of circle hooks on shark catchability and at-vessel mortality rates in longline fisheries. *Bulletin of Marine Science* 88(3):469-483.

⁶ Reinhardt, J.F., J. Weaver, P.J. Latham, A. Dell'Apa, J.E. Serafy, J.A. Browder, M. Christman, D.G. Foster, and D.R. Blankinship. 2018. Catch rate and at-vessel mortality of circle hooks versus J-hooks in pelagic longline fisheries: A global meta-analysis. *Fish and Fisheries* 19:413-430.

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**DRAFT RECOMMENDATION BY ICCAT ON THE BY-CATCH OF SEA TURTLES CAUGHT IN
ASSOCIATION WITH ICCAT FISHERIES
(combine, streamline, and amend Recommendations 10-09 and 13-11)**

(previously discussed but not adopted as PA4-812C/2019)

Proposal submitted by Belize, Nicaragua, and the United States

RECALLING that the *Recommendation by ICCAT Amending Recommendation 10-09 on the Bycatch of Sea Turtles in ICCAT Fisheries* (Rec. 13-11) stated that upon receipt of advice from the Standing Committee on Research and Statistics (SCRS), the Commission shall consider additional measures to mitigate sea turtle bycatch in ICCAT fisheries, if necessary;

RECOGNIZING that the SCRS and its Subcommittee on Ecosystems and By-catch (SubComECO) have confirmed high annual rates of bycatch of sea turtles in ICCAT longline fisheries, particularly in shallow-sets, and have recommended that the Commission consider adopting for shallow-set longline fisheries at least one of the following mitigation measures: (1) use of large circle hooks; (2) use of whole finfish bait; (3) other measures considered effective by the SCRS;

MOTIVATED BY repeated discussions at the SCRS SubComECO, including in 2019, identifying that experimental and meta-data analyses indicate that large circle hooks are an effective measure to reduce sea turtle bycatch and could also increase post-release survival;

GUIDED BY recent work that has led to advancements in best practices and technologies to avoid fisheries interactions and/or reduce the frequency of interactions with sea turtles, through scientific studies including joint analyses between the Western and Central Pacific Fisheries Commission (WCPFC) and Common Oceans ABNJ Tuna Project workshops (2016), which indicate that the use of large circle hooks and fish bait, independently and together, reduce the rate of interaction and significantly decrease sea turtle mortality due to incidental capture in fisheries;

FURTHER RECALLING that the Report of ICCAT's Second Independent Performance Review recommended that the Commission consider the adoption of measures to reduce sea turtle bycatch such as the mandatory use of circle hooks;

TAKING INTO ACCOUNT the obligations of Contracting Parties, Cooperating non-Contracting Parties, Entities or Fishing Entities (hereafter referred to as CPCs) under the *Recommendation by ICCAT on Information Collection and Harmonization of Data on Bycatch and Discards in ICCAT Fisheries* [Rec. 11-10] and the *Recommendation by ICCAT to Establish Minimum Standards for Fishing Vessel Scientific Observer Programs* (Rec. 16-14) to report their fisheries' interactions with sea turtles using the SCRS statistical form;

CONSISTENT WITH measures adopted by both the WCPFC and the Inter-American Tropical Tuna Commission to mitigate fisheries' impacts on sea turtles, in 2018 and 2019, respectively; and

ACKNOWLEDGING the urgent need to reduce the impacts of ICCAT fisheries on threatened and endangered sea turtle populations within the Convention area;

THE INTERNATIONAL COMMISSION FOR THE CONSERVATION
OF ATLANTIC TUNAS (ICCAT) RECOMMENDS THAT:

1. In order to reduce bycatch and increase post-release survival of threatened and endangered sea turtle populations within the Convention area, CPCs shall:
 - a) require that their vessels employ at least one of the following mitigation measures in their longline fisheries fishing in a shallow-set manner (i.e., whereby the majority of hooks fish at depths shallower than 100 meters):
 - i. Use of large circle hooks¹; or
 - ii. Use of only finfish bait²; or
 - iii. Other measures considered effective by the SCRS and approved by the Commission in the future.
 - b) require that their purse seine vessels avoid encircling sea turtles to the extent practicable, release encircled or entangled sea turtles, including on fish aggregating devices (FADs), when feasible, and report these interactions in the CPC reporting requirements specified in paragraph 4 of this measure.
 - c) take all reasonable steps to ensure the safe release of sea turtles in a manner that maximizes the likelihood of their survival by requiring that:
 - i. their purse seine and longline vessels, and other types of vessels that use gear that may entangle sea turtles, carry on board line-cutters and basket lifts or dip nets; and
 - ii. the owners, operators, and crew of such vessels, as well as any on-board observers, use such equipment by following the safe handling and release practices in the Appendix, and consistent with the “Best practices for sea turtle handling and release” of the FAO *Guidelines to Reduce Sea Turtle Mortality in Fishing Operations* (2009³).
2. CPCs with fisheries other than shallow-set longline fisheries (e.g., deep-set longline and gillnet) are encouraged to undertake research trials on potential bycatch and bycatch mortality mitigation measures, including hook sizes and shapes, the resulting tradeoffs among catch rates of target and bycatch species, and to report the results of these trials to the SCRS. Based on the results of such research, the SCRS shall advise the Commission on potential sea turtle mitigation measures for these fisheries.
3. In order to improve estimates of sea turtle bycatch in ICCAT fisheries, CPCs shall endeavor to increase scientific observer coverage beyond the minimum level required in Rec. 16-14, taking into consideration economic and practical feasibility.
4. Consistent with the bycatch reporting obligations under Recs. 11-10 and 16-14, each CPC shall collect, and annually report to ICCAT, information on their interactions with sea turtles in ICCAT fisheries by gear type, including catch rates that take into consideration gear characteristics, time of year and locations, target species, and disposition status (i.e., discarded dead or released alive). Data to be recorded and reported must also include a breakdown of interactions by sea turtle species, and, where possible, include the nature of the hooking or entanglement (including with fish aggregating devices), size of the animal, and bait type, hook size, type, and depth.

¹ Circle hooks are defined as a hook with the point turned perpendicularly back to the shank to form a generally circular or oval shape. CPCs are encouraged to adopt the use of circle hooks with an offset of no more than 10 degrees.

² The SCRS shall advise the Commission on the impact of using lures in combination with finfish bait as terminal gear in commercial fisheries on sea turtles by 2023. Pending receipt of this advice by the Commission, this lure/bait combination shall be considered to satisfy this requirement.

³ <http://www.fao.org/docrep/012/i0725e/i0725e.pdf>

5. Paragraphs 1-4 shall not apply to vessels operating only north of 55 degrees N or south of 35 degrees S latitude (i.e., primarily outside the geographic range of Atlantic sea turtles).
6. In their Annual Reports to ICCAT, CPCs shall report on the steps they have taken to implement this Recommendation. CPCs that qualify for the exemption specified in paragraph 5 shall report the exemption in their Annual Report once for the duration that the exemption applies.
7. The SCRS shall continue to review any new relevant information on sea turtle bycatch mitigation measures and advise the Commission on their effectiveness and their impacts on other species, as appropriate. As part of this work, in 2022, the SCRS shall analyze scientific information regarding different circle hook sizes and their effectiveness at mitigating sea turtle bycatch (decreasing catch and increasing post-release survival) in shallow-set longline fisheries, including the impact on catch rates of other target and non-target species, and provide relevant recommendations to the Commission based on the results of this analysis.
8. Considering the particular situation of coastal developing CPCs, the special funds established in 14-14, 13-19, and 03-21 should be strengthened through the allocation of funds, from voluntary contributions of CPCs and inclusion of specific budget lines, to facilitate the implementation of this Recommendation, including for training fishermen on safe handling and release, providing related equipment, or supporting trials for new mitigation techniques.
9. This recommendation repeals and replaces both the *Recommendation by ICCAT on the By-catch of Sea Turtles in ICCAT Fisheries* (Rec. 10-09) and the *Recommendation by ICCAT Amending Recommendation 10-09 on the By-catch of Sea Turtles in ICCAT Fisheries* (Rec. 13-11).
10. This Recommendation shall take effect on January 1, 2023.

Safe Handling and Release Practices for Sea Turtles

1. Purse seine safe handling and release

- a) Whenever a sea turtle is sighted in the net, all reasonable efforts should be made to rescue the turtle before it becomes entangled in the net.
- b) No turtle shall be hauled from the water by a fishing line attached to, or entangled upon, the body of a turtle.
- c) If a turtle is entangled during net roll, the net should be hauled over the turntable to a height of about 2 meters, the main boom should be moved to starboard or to port (depending on the vessel's direction), and the net should be rolled back, so that the crew can release the turtle from the netting as soon as possible, and return it to the sea over the starboard or port side if it is active. Net roll should not start again until the turtle has been disentangled and released.
- d) If, in spite of the measures taken under paragraphs a and b of this section, a sea turtle is accidentally brought on board the vessel and is alive and active, or dead, the sea turtle should be released as quickly as practicable.
- e) If a turtle is brought aboard the vessel and is comatose or inactive, resuscitation should be attempted (paragraph 3).

2. Longline safe handling and release

- a) When practicable, and when operator or crew on board are trained, comatose sea turtles should be brought on board immediately.
- b) Upon sighting a turtle, the vessel and line reel speed should be slowed and the vessel direction adjusted to move toward the turtle, minimizing tension on the line.
- c) No turtle shall be hauled from the water by a fishing line attached to, or entangled upon the body of a turtle.
- d) If a sea turtle is too large or hooked in such a manner as to preclude safe boarding without causing further damage/injury to the turtle, line clippers should be used to clip the line and remove as much line as possible prior to releasing the turtle.
- e) If a sea turtle is observed to be hooked or entangled by longline gear during hauling operations, the vessel operator should immediately cease hauling operations until the turtle has been removed from the longline gear or brought on board the vessel.
- f) If hooked externally or hook is fully visible, hooks shall be removed from sea turtles as quickly and carefully as possible. If a hook cannot be removed from a turtle (e.g., ingested or in roof of mouth), the line shall be cut as close to the hook as possible.
- g) Live turtles should be returned to the sea after handling:
 - i. By putting the vessel engine in neutral gear so that the propeller is disengaged and the vessel is stopped, and releasing the turtle away from deployed gear; and
 - ii. Observing that the turtle is safely away from the vessel before engaging the propeller and continuing operations.
- h) If the sea turtle brought aboard the vessel is comatose or inactive, resuscitation should be attempted (paragraph 3).

3. Resuscitation for a turtle on board

- a) When handling a sea turtle, attempts should be made to hold the animal by the shell, avoiding the head and neck region, and flippers.
- b) Strive to remove and/or disentangle any foreign items from the sea turtle, such as any plastic items, netting, or embedded hooks, etc.
- c) Placing the turtle on its bottom shell (plastron) so that the turtle is right side up, safely isolated and immobilized on a cushioned surface, such as an automobile tire without a rim, a boat cushion, or coil of rope. The primary purpose of the cushioned surface is to elevate the turtle from the deck to assist in restraining it. Elevate its hindquarters at least 6 inches (15 cm) for a period of 4 up to 24 hours. The amount of the elevation depends on the size of the turtle; greater elevations are needed for larger turtles. Periodically, rock the turtle gently left to right and right to left by holding the outer edge of the shell (carapace) and lifting one side about 3 inches (8 cm) then alternate to the other side. Gently touch the eye and pinch the tail (reflex test) periodically to see if there is a response.
- d) Sea turtles being resuscitated should be shaded and kept damp or moist but under no circumstance be placed into a container holding water. A water-soaked towel placed over the head, carapace, and flippers is the most effective method in keeping a turtle moist.
- e) Sea turtles that revive and become active should be released over the stern of the boat only when fishing gear is not in use (i.e., not actively being set or hauled), when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels.
- f) Sea turtles that fail to respond to the reflex test or fail to move within 4 hours (up to 24, if possible) should be returned to the water in the same manner as that for actively moving turtles.