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**BEST HANDLING AND RELEASE PRACTICES FOR SEA TURTLES CAPTURED IN IATTC
FISHERIES**

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This document is an update of EB-03-05 which was prepared in response to the EBWG recommendation and call for a potential update of Resolution C-19-04 that also included a request for updated best handling and release practice guidelines (BHRP). The present document has undergone several rounds of review and consultation with CPCs and external experts identified by CPCs in response to Memorandum 0601-410 and during the continuation of the 1st IATTC Workshop to Advance Best Handling and Release Practice Guidelines for Sharks, Sea turtles and Seabirds during January 2026.

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SUMMARY

Reducing mortality of incidentally captured sea turtles in tuna fisheries is a conservation priority. Best handling and release practices (BHRP) offer an effective and low-cost solution to improve post-release survival (PRS) of animals, but their success depends on fisher training, outreach, and the practicality of implementation. This document is a reflection of the Inter-American Tropical Tuna Commission’s (IATTC) efforts to update and refine existing BHRP guidelines for sea turtles interacting with the fishing gears under the IATTC purview, in accordance with Resolutions C-04-05, C-04-07 and C-19-04, and the FAO Code of Conduct for Responsible Fisheries. Building on mandates from the Ecosystem and Bycatch Working Group (EBWG-2, EBWG-3), SAC-15, the 2nd Circle Hook Workshop to update the sea turtle BHRP guidelines for all fisheries, this version of the BHRP guidelines for sea turtles is the distillation of the consolidated national guidelines, scientific literature, expert feedback, industry perspectives, content provided by CPCs in response to Memorandums 0473-410 and 0601-410, as well as comments received on an earlier version of the BHRP guidelines (EB-03-05) during the continuation of the 1st IATTC Workshop to Advance BHRP Guidelines for Sharks, Sea turtles, and Seabirds in January of 2026. It identifies harmful practices that

should be avoided, highlights gear-specific considerations, offers improved recommendations for purse seine, hook and line, gillnet and set-net fisheries and an updated list of required tools for the recommended practices for each fleet segment.

1. BACKGROUND

One of the most effective and cost-efficient ways of reducing mortality to incidentally caught vulnerable¹ species is to ensure that fishing fleets adopt and utilize best handling and release practices (BHRP) to minimize harm and improve post-release survival (PRS) probabilities. BHRP are usually common-sense and may only require small behavioral changes that fishers can employ with measurable improvements in PRS rates. But efficacy and implementation are dependent on education, training and outreach capacity to ensure fishers are aware of both the adopted 'best' practices and those that should be avoided when releasing non-target vulnerable species. Proper handling techniques, particularly for sea turtles, can significantly enhance survival outcomes for animals returned to the sea (see review in [EB-01-01](#)) because they are often alive when the gear is retrieved across fishing sectors (Andraka et al. 2013, [EB-03-01](#)).

In line with the mandates of the Antigua Convention and the FAO Code of Conduct for Responsible Fisheries, the Inter-American Tropical Tuna Commission (IATTC) has adopted several resolutions to mitigate the impacts of tuna fisheries on sea turtles, with Resolutions [C-04-05](#), [C-04-07](#) and [C-19-04](#) remaining active to date, and containing content relevant to BHRP, which, among other requirements, Resolution C-19-04 requires IATTC Members and Cooperating Non-Members (CPCs) to:

1.a. Require owners/operators/vessel crew on vessels targeting species covered by the Convention to promptly release, in a manner that causes the least harm to the extent practicable, all sea turtles, without compromising the safety of any persons.

With specific requirements for both purse seine and longline fishing vessels to:

'carry on board, and employ when appropriate, safe-handling tools for the release of sea turtles (e.g. dip nets)' and to 'take all reasonable steps, as appropriate, to ensure the safe release of any incidentally-caught sea turtles by following handling and release guidelines in the Appendix, and consistent with the FAO "Best practices for sea turtle handling and release."'

Recommendations specific to BHRP guidelines and sea turtles also came from the [2nd Ecosystems and Bycatch Working Group \(EBWG\)](#) in 2024 when the following was requested:

'A second circle hook workshop be conducted that will fulfill the mandate of paragraph 3(d)(i) of Res. C-19-04.' And that 'the workshop include development of a third mitigation measure as described in Paragraph 3(d)(iii) of C-19-04 for small coastal multi-species vessel fleets as well as best handling and release practices'

Further pursuant to the development and adoption of BHRP for vulnerable taxa the SAC-15 requested,

'That a program of dialogue be established between scientific staff, managers, fleet managers, and captains of the tuna fleets of the CPCs, with respect to: ... (b) Implementation of new methods on best practices for release of bycatch species...'

Following these discussions, in November 2024, the IATTC Secretariat issued Memorandum 0601-410,

¹ Unless specified otherwise, including but not limited to citations to vulnerability assessments and any qualitative/quantitative scores (e.g. BYC-10 INF-B; SAC-13-11), the staff's definition of "vulnerable species" refers to the species that, in the *sensu latu*, and due to their low-productivity and life-history traits (i.e. K species in r/K selection theory), are more vulnerable to the impacts of fisheries and other anthropogenic activities on these species or their habitat and ecosystem. This includes marine mammals, seabirds, sea turtles and elasmobranchs.

inviting CPCs to contribute to the development of comprehensive BHRP guidelines by providing:

1. Existing national regulations or guidelines on BHRP for sea turtles, sharks, seabirds, and rays,
2. Data on post-release fate and survivability of these species,
3. Subject matter experts for technical input,
4. Industry representatives to ensure that BHRP guidelines are both effective and practical for fisheries operations.

Several CPCs submitted content and identified subject matter experts (SME) and industry personnel to assist in this process. The CPC content was synthesized and integrated into a set of BHRP for all IATTC fishing gears in document [EB-03-05](#) along with; the *2009 FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations*; updated published scientific evidence identifying both beneficial and harmful practices; physiological and anatomical considerations underpinning several of the recommendations; the results of consultations with wildlife veterinarians specializing in sea turtle interactions in fisheries; and industry perspectives on the BHRP recommendations for purse seine, longline and gillnet fisheries under the IATTC purview. The BHRP guidelines developed for longline fisheries ([HKS-02-01](#)) were presented and discussed during the [2nd Circle Hook Workshop](#) in April of 2025 and further refined for integration into [EB-03-05](#) following guidance received from the Workshop. The BHRP recommendations in EB-03-05 were presented to the EBWG-03 in May of 2025 and then further discussed during the continuation of the [1st IATTC Workshop to Advance BHRP Guidelines for Sharks, Sea turtles and Seabirds](#) in January of 2026. The EBWG-03 also adopted the following recommendation to the Commission *‘that, as soon as possible, if necessary, to make recommendations regarding the updating of best practice guidelines for sea turtle handling and release practices for all fisheries under the competence of the Commission’*.

The present document (EB-04-04) contains the distillation of the above consultations as well as the integration of helpful comments after a second round of reviews following the 1st IATTC BHRPs workshop and conducted by CPCs, SMEs and industry representatives. This document follows the framework for the generation and implementation of BHRP guidelines for all vulnerable species presented in [EB-02-02](#). Importantly, practices that are known to be deleterious to PRS are identified and listed in the ‘do not’ category for each fishing gear below, as [recommended by SAC-14](#). The structure of the guidelines follows the same format as the shark BHRP guidelines (SAC-17-10) where the guidance that is relevant to all fisheries is presented first to reduce redundancy throughout, followed by purse seine fisheries, then all hook and line fisheries and finally recommendations specific to other net gears (gillnet and set-net) are provided. Readers are encouraged to refer to the previous draft of these guidelines in [EB-03-05](#) for a more thorough explanation of the science and biological justifications underlying the sea turtle BHRP recommendations. That said, it is reiterated that the practices described below are all based on the best available science while prioritizing and ensuring the safety of the crew.

2. BEST HANDLING AND RELEASE PRACTICE GUIDELINES FOR SEA TURTLES

Effective implementation of BHRP depends not only on the availability of clear guidelines and tool recommendations, but also on adequate training and outreach that ensures fishers understand both the recommended practices and the biological and physiological rationale behind them. For sea turtles in particular, appropriate handling is critical, as many injuries that lead to mortality occur not during capture, but during the retrieval, onboard handling, or gear removal processes.

Fishers must be made aware of several important considerations before interacting with sea turtles. Notably, the bones and ligaments in a sea turtle’s flippers are fragile and not designed to support the animal’s weight out of water. Lifting or maneuvering turtles by their flippers can result in severe injury. When gear must be removed on board, the turtle’s body should be fully supported—ideally by lifting the

animal using the carapace (shell) or with a dip net, especially on vessels with high freeboards² (> 1m) or when the animal is too heavy to be safely lifted by hand.

In addition, sea turtles are inquisitive and highly prone to entanglement in a wide range of gear types, including nets, buoys, derelict or discarded fishing gear (e.g. hook and line, gillnets), and fish aggregating devices (FADs). Entanglement presents multiple risks, the most immediate being drowning, as sea turtles are air-breathing animals. Other consequences include: infection around the entanglement location, disfigurement, or even amputation of limbs. Particularly harmful is the ingestion of trailing gear left on hooked or entangled turtles, which can lead to internal injuries such as intestinal plication and eventual death. It is therefore essential to remove as much trailing gear as possible from all bycaught turtles before release to maximize post release survival (PRS).

Moreover, some turtles may be found in an exhausted or comatose state. These individuals require immediate resuscitation and sufficient recovery time on board to prevent post release drowning. For this reason, these recommendations also include guidelines for resuscitation (section 2.1.3) and release (section 2.1.4). Additionally, sea turtles should never be placed upside down during resuscitation or to immobilize them during transport. The internal organs are loosely suspended within the coelomic cavity, with the lungs positioned antero-dorsally just beneath the carapace (Figure 1). When placed on their back, gravitational displacement of the organs restricts lung expansion and impairs the muscular mechanics of breathing, making this position harmful and potentially fatal if prolonged.

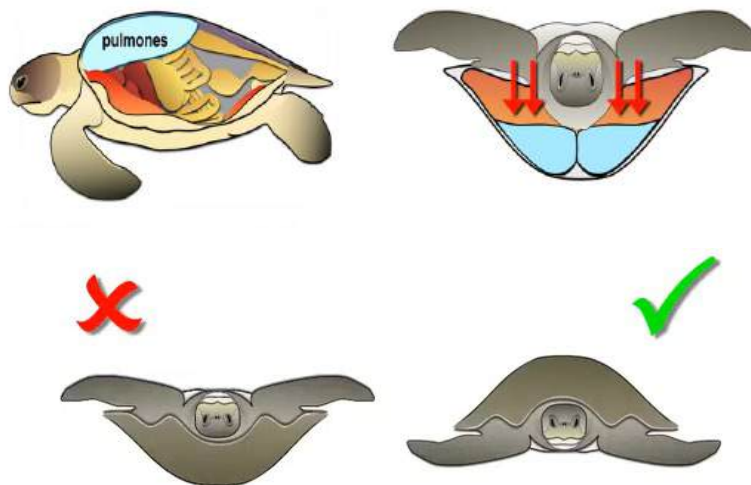


Figure 1. Dorso-anterior orientation of the lungs in sea turtles. When placed upside down the lung capacity is diminished. Never place sea turtles upside down (on the dorsum/back of their carapace/shell). Graphics borrowed from the video, 'IATTC/OFCF Learning to release sea turtles' available on the IATTC website [[Videos | IATTC](#)].

FIGURA 1. Posición anterodorsal de los pulmones en las tortugas marinas. Cuando se colocan boca arriba, su capacidad pulmonar disminuye. Nunca se debe colocar a las tortugas marinas boca arriba (sobre el dorso o la parte posterior de su caparazón). Imágenes tomadas del video "CIAT/OFCF: Aprendiendo a liberar tortugas marinas", disponible en la página web de la CIAT [[Videos | CIAT](#)].

²Freeboard is the distance between the vessel's deck and the sea surface.

2.1. All Fisheries

When a sea turtle is observed entangled or hooked in fishing gear, including gear from other fishing vessels and or 'ghost gear', CPCs should strive to assist in the safe disentanglement and resuscitation (if necessary) of all sea turtles following the guidance below.

2.1.1. Do:

- Promptly release unharmed all sea turtles from entanglements or hooking to the extent practicable, as soon as they are spotted.
- Determine the location of entanglement (or hooking) and whether or not the animal needs to be brought on board for disentanglement and or resuscitation.
 - For animals that can be safely brought on board – ensure their weight is supported by manually lifting the sea turtle using the carapace (shell) or by using a net.
 - For animals that cannot be brought on board for gear removal, cut as much gear away from the animal as possible.
- If the sea turtle is comatose (appears lifeless and/or is non-responsive), it should be brought on board the vessel for resuscitation, following the guidelines in section 2.1.3.

2.1.2. Do not:

- Maneuver, manipulate or lift sea turtles by the flippers, head or tail.
- Lift sea turtles by entangling gear or lines they are hooked on.
- Place sea turtles upside down for extended periods of time (> 5-10 minutes).
- Leave sea turtles on the deck exposed to the sun, for an extended period of time, except to the extent necessary to carry out these BHRPs.

2.1.3. Resuscitating a sea turtle:

The FAO guidelines for resuscitating sea turtles notes that sea turtles caught in nets, hooked in longlines or entangled in other gear may be stressed, tired and appear lifeless. If they are returned to the water before they recover, they will often drown. Sea turtles that appear lifeless or unresponsive are not necessarily dead but may be comatose, and can recover if allowed to do so onboard the vessel. A comatose sea turtle may recover onboard once its lungs have drained of water which can take up to 24 hours or longer in some cases. The steps below describe the proper technique for handling and positioning sea turtles in a manner that encourages recovery, often referred to as resuscitation.

To improve a sea turtle's chance of recovery after gear is removed, the sea turtle should be released in waters of a similar temperature to where it was captured, if possible. A cold stunned animal or one that was caught in waters too cold for its survival (< 60° F/16° C) would need to be released in warmer waters.

Do:

If a sea turtle appears dead, comatose, or otherwise inactive, take the following actions:

- Bring the animal onboard safely by supporting its weight manually on the carapace or by using a net.
- Place the sea turtle on its belly and elevate its hind end at least 6 inches (15 - 20 cm). Elevation of the hindquarter of the sea turtle allows for water in the lungs to drain.
- Occasionally rock the sea turtle gently side to side by holding the outer edge of the shell and lifting one side about 3" (~8 cm) , then alternate to the other side.
- Administer a reflex test at least once every 3 hours or until the sea turtle is moving. The reflex test is performed by **gently** touching the area near the eye and the tail of the sea turtle to determine

if it is responsive and potentially recovering.

- Keep the sea turtle shaded and, in hot weather, they should also be kept moist with a wet towel on the shell and flippers.
- Attempt resuscitation for at least 4 hours. Effort can be stopped if there are no signs of life after 24 hours on deck, or if the muscles are stiff and/or the flesh has begun to rot. If there is an eye reflex, give it more time.
- Return a revived sea turtle to the sea after it becomes visibly and highly active following guidance in section 2.1.4. Sea turtles that fail to revive must also be returned to the sea in the same manner as if they were alive. Sea turtles that appear alive or active when captured should be released as soon as it is safe to do so after fishing gear has been removed.

2.1.4. Releasing a sea turtle:

After removal of fishing gear and resuscitation (if necessary), unless national regulations require the retention of seriously injured individuals to be transported to rehabilitation centers, sea turtles shall be promptly returned to the sea. Fishers must ensure that the animal is released in the same location where it was initially captured, or at the very least in a location where the sea surface temperature is the same as in the location where it was captured. Generally, water temperatures $>16^{\circ}\text{C}$ are suitable for release. Sea turtles become lethargic or unresponsive (referred to as cold stunned) in water temperatures at or below 10°C .

When a sea turtle is released into the ocean:

Do:

- Place the vessel engine in neutral gear so that the propeller is disengaged, and the vessel is stopped.
- Release the sea turtle away from any deployed fishing gear, at a location on the vessel closest to the water line. For vessels with very high freeboard (e.g. $> 4\text{m}$) consider lowering sea turtles to the water using a non-entangling net/basket/grid or other such device.
- Place the animal at a 45-degree angle towards the water and release gently.
- Observe that the sea turtle is safely away from the vessel before engaging the propeller and continuing operations.

2.1.5. Sea turtle BHRP Tools Necessary for All Fisheries

The FAO (2009) Guidelines recommend that all vessels be equipped with the necessary tools to implement BHRPs. In alignment with this, Resolution C-19-04 mandates that *CPCs require owners and operators of purse seine and longline vessels to carry on board, and use as appropriate, safe-handling tools for the effective release of sea turtles (e.g., de-hookers, line cutters, and nets)*. Accordingly, when a sea turtle is hooked or entangled in any fishing gear, vessel operators should utilize the appropriate tools to minimize injury and enhance post-release survival. To support implementation in the eastern Pacific Ocean (EPO), IATTC staff have compiled a recommended list of handling tools specific to the region's fishing fleets. These tools are categorized based on vessel freeboard height, with a distinction made at higher than one meter. For vessels with freeboards less than one meter, manual access to the water is possible, and long-handled devices may not be necessary for bringing animals onboard or for gear removal.

Tools required:

- Non-entangling net/basket/ grid or other such device that can either bring a sea turtle from the water surface to the vessel or conversely to lower and release the sea turtle from the vessel to the water.
- Cutters capable of cutting all netting and lines used in the vessel's fishing gear.
- Tire, block or a suitable and safe platform or surface for elevating sea turtles during gear removal and resuscitation. The tail should be elevated above the head by 6 inches (~20 cm) to allow water to drain from the lungs. Larger sea turtles may require additional elevation to facilitate water draining from the lungs.
- Towel for keeping sea turtles shaded and moist during resuscitation.

2.2. Purse Seine Fisheries

Resolution C-19-04 Paragraph 2.b. requires:

.. in the event a sea turtle is sighted in a purse seine net, that owners/operators/vessel crew of purse seine vessels take all reasonable steps, as appropriate, to ensure its safe release by following handling and release guidelines in the Appendix 1, and consistent with the "Best practices for sea turtle handling and release" of the FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations (2009)

For purse seine fisheries, the FAO "Best practices for sea turtle handling and release" guidelines (FAO 2009) states:

The following specific measures are recommended in cases when a sea turtle is caught (1) whenever a sea turtle is sighted in the purse seine, all reasonable efforts should be made to rescue the turtle before it becomes entangled in the net, including, if necessary, the deployment of a speedboat; (2) If a turtle is entangled in the net, hauling should stop as soon as the turtle comes out of the water and should not start again until the turtle has been disentangled and released; and (3) if a turtle is brought aboard the vessel, all appropriate efforts to assist in the recovery of the turtle should be made before returning it to the water.

The updated BHRP recommendations below integrates both the text from FAO (2009) and Resolution C-19-04 Annex 1. Because in purse seine fisheries sea turtles may be encountered at different stages of the fishing operation, where they may be found entangled in a drifting FAD or other derelict fishing gear, they may be seen free-swimming while encircled by the purse seine net, they may come up entangled in the purse seine during net hauling or they can be brought up with the catch via the brailing operations, the draft guidelines below follow the stages of the purse seine fishing operation. Regardless of when sea turtles are first detected they may require time on the vessel to rest and recover (resuscitation). The resuscitation and release guidelines are applicable across fisheries and are provided in the 'All Fisheries' section (2.1). Section 2.1 also contains practices that must be avoided (e.g., handling sea turtles by the flippers, placing them upside down).

2.2.1. Entangled in FADs

FAD designs improved in 2015 (C-16-01) and 2025 (C-23-04) to reduce, and even eliminate, entanglement in drifting FADs. Therefore, sea turtles are almost never observed entangled in FADs and this is expected to decrease to zero over time. However, in the rare event that a sea turtle is observed tangled in a FAD, they must be rescued/released as required by Resolution C-19-04 which states, in paragraph 2:

c. Require owners/operators/vessel crew of purse seine vessels to promptly release unharmed, to the extent practicable, all sea turtles observed entangled in fish-aggregating devices (FADs).

If a sea turtle is seen entangled in a drifting FAD-

Do:

- Endeavor to free the sea turtle from the FAD. This may require purse seine vessels to launch a small boat or speed boat to facilitate the rescue (as recommended by the FAO [2009] guidelines).
- Fishers should carefully cut any entangling gear, netting, or other fishing gears off the animal and carefully return them to the sea, supporting the weight of the animal from the carapace (not manipulating the sea turtle by the flippers).
- If the sea turtle is comatose, it should be brought aboard the purse seine vessel for resuscitation (see section 2.1.3).

2.2.2. Sea turtles observed encircled by the purse seine

If sea turtles are seen swimming inside the net post encirclement, C-19-04 Appendix 1.a. recommends,

“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.”

The FAO guidelines further state that these efforts may *include, ‘if necessary, the deployment of a speedboat’.*

The conservation benefits of this provision have been called into question because it has been reported during skipper workshops that sea turtles often actively evade rescue, diving deeper into the net and consequently become entangled deeper in the net, rendering this action potentially more dangerous for their survival. When and if the Resolution is subject to revision – this recommendation may need to be revisited. Thus, the updated recommended language for these scenarios is:

If sea turtles are sighted encircled by the net but still free-swimming

Do:

- All reasonable efforts should be made to facilitate the rescue and release of encircled sea turtles.
- If the sea turtle is comatose, it should be brought aboard the purse seine vessel for resuscitation (see section 2.1.3).

Do not:

- Chase the sea turtle inside the net if it is evading rescue.

2.2.3. Sea turtles entangled in the net during net roll

Some sea turtles may become entangled in the net during retrieval (net roll). These individuals are almost always alive at the vessel, and over 90% are released alive ([EB-02-01](#)). Because it is possible that a turtle lifted out of the water while entangled in the net could fall out of the net and be injured or killed if passed through the power block (FAO 2009), the guidance derived from C-19-04 Appendix 1 should be maintained (with a slight clarification on the active versus inactive side of the vessel).

In addition, a ban on rolling sea turtles through the power block should be considered, as this is a harmful and deadly practice.

Thus, the updated recommended language for these scenarios is:

If sea turtles become entangled in the net during net roll

Do:

- If a sea turtle is entangled during net roll, the net should be hauled over the turntable to a height of about 2 meters, and the net should be rolled back, so that the crew can release the sea turtle from the netting as soon as possible, and return it to the sea over the inactive (opposite to fishing and net rolling operations) side of the vessel.
- If a sea turtle is brought aboard the vessel and is comatose or inactive, resuscitation should be attempted (section 2.1.3).
- Net roll should not start again until the sea turtle has been disentangled and removed from the net.
- Release the sea turtle back to the sea as soon as possible according to the guidelines in section 2.1.4

Do not:

- Pass sea turtles through the power block.

2.2.4. Sea turtles brought onboard via brailing

The guidance derived from C-19-04 Appendix 1 c and d is also applicable in these situations, when sea turtles are brailed onboard, and should be maintained. In addition, it is essential that sea turtles are sorted from the catch on the main working deck and do not go down the loading hatch to the wet/well decks to reduce injury and mortality.

If sea turtles are brought onboard during brailing operations

Do:

- Ensure sea turtles are separated from the catch on the main/working deck.
- If a turtle is brought aboard the vessel and is comatose or inactive, resuscitation should be attempted (section 2.1.3).
- Release the sea turtle as soon as possible according to the guidelines in section 2.1.4

Do not:

- Pass sea turtles through the loading hatch to the wet/well decks.

2.2.5. Purse seine BHRP tools: (in addition to those tools listed in the 'All Fisheries Tools' section 2.1.5 above)

- Net for lifting and lowering sea turtles to and from the small/speed/work boats.
- Brail, non-entangling sling or other device (e.g. similar to the manta grid) for lifting and lowering sea turtles to and from the purse seine vessel.

2.3. Hook and Line Fisheries

If vessels cannot safely bring the sea turtle on board (either the animal is too large, there is no net or the vessel free board is too high to bring turtles up manually), fishers must ensure that the line is cut at the hook or at the mouth and this is advised over removing the hook (Parga 2012; Barria and Valerio in press; Andraka and Parga pers comm). Additionally, if hooks have been ingested and are not visible, hook removal is not recommended. There are several structures in the esophagus (gullet) of a sea turtle that are fragile and highly vascularized,

and severe damage to the area is likely during removal of ingested hooks.

Poor handling practices can also lead to or increase the severity of injuries, mostly occurring when fishers retrieve the animals towards the vessel, haul the animals on board without using a net (i.e. by the line and/or by the flippers), or during gear removal. If the operation is not conducted in a careful way, tension on the line can embed the hook deeper and cause extensive lesions and even long tears at the point where it is lodged (Parga 2012). Animal handling and gear removal all carry different risks to the post release condition of sea turtles and they vary across hook types (see the review in [EB-03-05](#)). Thus, fishers must be made aware of the risks present across all scenarios and informed on the decision criteria for when to bring an animal on board or when to leave it in the water and when to remove a hook or when it should be left in place.

Animals that are in good condition at the vessel and handled in the appropriate manner, with all gear removed and no internal injuries, have demonstrated high PRS rates (100%) for longline fisheries (Swimmer et al. 2006).

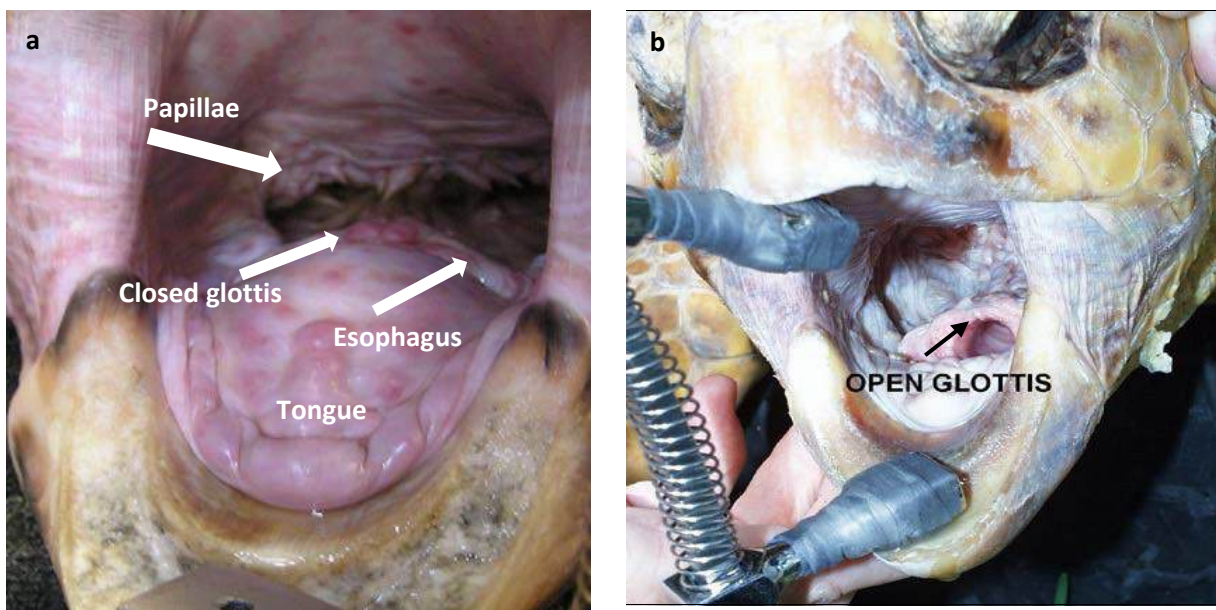


FIGURE 2 a and b. Sea turtle oral cavity anatomy (a) closed glottis (entrance into the trachea or windpipe), tongue, esophagus (gullet) and papillae; (b) open glottis (Taken from Stokes and Bergmann (eds) 2019. NMFS/ Southeast Fishery Science Center photos).

FIGURA 2 a y b. Anatomía de la cavidad oral de las tortugas marinas: (a) glotis cerrada (entrada a la tráquea), lengua, esófago (garganta) y papilas; (b) glotis abierta (Tomada de Stokes y Bergmann (eds) 2019. Fotos del NMFS/ Centro de Ciencias Pesqueras del Sudeste).

However, hook position, trailing gear and improper handling effects can significantly reduce PRS rates of sea turtles, where animals that are hooked deeper in the esophagus or gut often have higher mortality rates (34-65%) than those hooked in the upper esophagus or mouth (8-18%) (Casale et al. 2008; Chaloupka et al. 2004; Sasso & Epperly 2007; Swimmer et al. 2014). The highest probability of acute mortality is believed to occur when hooks are ingested (as often occurs with J hooks) and puncture the stomach, lower esophagus, heart, or lung. Moreover, lines left trailing on embedded hooks are especially dangerous and can kill or disable sea turtles weeks to months after release. Data from stranding centers and postmortem examinations (necropsies) confirm that the presence of trailing gear on hooks actually has the largest impact on PRS rates (e.g. Parga, 2012; Vannucci et al. 2024). Trailing line can entangle the flippers leading

to infection or amputation. If the line is ingested, it severely injures or obstructs the gut over time (Lucchetti and Sala 2010; Di Bello et al. 2013; Lima et al. 2022; Parga 2012; Swimmer & Gilman 2012, Vanucci et al. 2024). Even short lengths of ingested or external line can be lethal. Therefore, removing all fishing line is essential and should be done whenever possible, even when the hook cannot be removed safely (Stokes and Bergmann 2019).

Deciding whether to remove a hook is a critical step that can significantly influence a turtle's likelihood of survival. In general, externally embedded hooks should be removed carefully, avoiding excessive force that could break bones or cause excessive damage to soft tissues. Hooks located in the mouth may be removed if the point of insertion is clearly visible; however, caution is warranted due to the presence of highly vascularized and specialized anatomical structures (e.g. glottis) that can lead to fatality if damaged (see Figure 2). The glottis, situated in the middle of the tongue (Fig. 2b), is a valve at the entrance of the trachea or windpipe that serves to open and close the airway during breathing and diving. Hooks lodged in this area should be left in place, as damaging the glottis could allow water or microbes to enter the lungs, potentially leading to pneumonia or death (Parga 2012; Stokes & Bergmann 2019). Similarly, hooks in the roof of the mouth may damage the eyes, nerves or even the brain leading to severe debilitation or death. The esophagus or gullet, located at the rear of the mouth and lined with conical pointed shaped structures (papillae; Figure 2a), is relatively tough and flexible (Díaz-Figueroa & Mitchell 2006). However, only superficially embedded hooks with visible entry points should be removed, and with extreme care because rough handling or forceful removal can lethally damage the esophagus or surrounding structures or result in infection (Orós et al. 2004), or fatal bleeding (Ryder et al. 2006; Casale et al. 2008). Hooks deeply embedded in the esophagus, particularly when the entry point is not visible, should never be removed. The guidance below can assist with assessing whether removal of a hook is appropriate. In situations where removal is unsafe, line cutters should be used to cut the line as close to the hook eye as possible. If part of the hook is exposed but cannot be extracted, bolt cutters may be used to remove the visible portion of the hook. Recommended BHRP Guidelines for all hook and line fisheries (applicable to longline, shortline, handline, troll, pole and line fisheries) are provided below.

When a sea turtle is seen entangled in fishing gear or hooked on a line:

Do:

- Bring the vessel to a stop and slow the hauling of the gear.
- Minimize tension on the line the sea turtle is captured on.
- Slowly maneuver the vessel towards the animal. Put the vessel in neutral once the sea turtle is brought alongside.
- Determine whether or not the animal can safely be brought onboard. Ideally hooked sea turtles will be brought onboard to remove all fishing gear.
 - A sea turtle can 'safely' be brought on board either by a) using a net or other approved lifting device to support its weight or b) manually lifted onboard by supporting its weight on the carapace.
 - 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 animal, leave the sea turtle in the water for gear removal.
 - If sea turtles are not hooked but are entangled, cut all gear away from the animal.

Do not:

- Haul animals onboard using the line they are hooked on or entangled in.

For sea turtles that can safely be brought on board:

Do:

- Determine whether or not the hook should be removed and remove as much gear as possible.
- If the hook point is visible:
 - Place a piece of wood or other mouth opener carried onboard (see section 2.3.1) in the sea turtle's mouth so that it cannot bite, then proceed with inspection of hooking location and hook and line removal, as appropriate.
 - If the hook's point and barb are visible, use bolt cutters to cut the point of the hook and remove the hook. If the hook point cannot be cut, depress the barb prior to backing the hook out. Use pliers (if necessary) to back the hook out without injuring the fragile tissues (i.e. glottis and papillae) in the mouth and esophagus.
 - If the hook cannot be removed, cut all trailing gear off the hook and cut any portion of the hook that can be cut off and removed from the animal.
- If the hook is inside the mouth or has been partially swallowed but the insertion point is visible:
 - Using the tools available to open the mouth (listed below), have one crew member hold the mouth open while another crew assesses whether the hook can be removed without further injury. If the insertion point of the hook is visible and is in the tongue or esophagus and can be backed out or removed using a dehooker without tearing tissue, remove the hook.
 - If the hook is deeply embedded in the esophagus, glottis or papillae, do not remove the hook. If it cannot be removed, cut as much of the hook out as possible and ensure all line has been removed from the animal.
- Return the animal to the sea as soon as possible following the resuscitation and release guidelines in section 2.1.

Do not:

- Attempt to remove an embedded hook without first determining the point of insertion.
- Remove hooks that are embedded in the glottis or deeply within the esophagus, or if the point of insertion is not visible.
- Release sea turtles with more than 5 cm (the length of a finger) of fishing line still attached to the hook or entangling the animal.
- Return comatose sea turtles to the sea without following the resuscitation guidelines in section 2.1.3

For sea turtles that cannot safely be brought on board and must remain in the water:

This applies to sea turtles that are too large to bring onboard and those situations when vessels are not carrying the appropriate tools to bring smaller sea turtles onboard.

Do:

- If the hook is visible:
 - If the animal is entangled and hooked, remove the hook first. Then, after the hook is removed, proceed to remove all line.
 - Use a dehooker (long-handled) to remove externally embedded hooks from the animal.

- If the hook cannot be removed using a dehooker, use line cutters (long-handled) to cut the line as close to the hook as possible, leaving no more than 5 cm (finger length) of trailing gear on the hook.
- If the hook has been swallowed and is not visible:
 - Cut the line as close to the mouth as possible – leaving no more than 5 cm (finger length) of trailing gear.

Do Not:

- Attempt to remove hooks that are within the mouth or swallowed for sea turtles that are not boarded.
- Release sea turtles without cutting away and removing as much line as possible, preferably leaving 5 cm or less (finger length) remaining on the animal.

2.3.1. BHRP Tools for Hook and Line Fisheries:

The FAO (2009) Guidelines provide a comprehensive list of equipment essential for the safe handling of sea turtles captured in longline fisheries along with an illustrated guide for dehooking and resuscitating sea turtles (Appended to this document in Annex 6.3). Note that the names of some types of dehookers available from different manufacturers and referenced in some regional protocols include the term “internal.” *While these dehookers may be used to remove hooks from the mouth (as described above), they are not intended to be used to remove swallowed hooks or when the point of insertion is not visible.*

In addition to the BHRP tools listed in Section 2.1.5 for All Fisheries, all hook and line vessels must carry:

- Wire or bolt cutters capable of cutting through any of the hooks on the vessel.
- Long-nose or needle-nose pliers
- Short-handled dehooker
- At least two of the following mouth openers and gags:
 - Block of hard wood
 - Mouth prop, bite block, gag made of rope, oral speculum or other device that functions to hold the mouth open
 - Two rope loops covered with hose

Vessels with freeboard³ height exceeding 1 meter must also have the following sea turtle handling/dehooking gear on board:

- Long-handled line cutter (equal or greater in length from the gunwale to the waterline) capable of cutting fishing line or leaders within 5 cm of the eye of an embedded hook, or as close to the mouth as possible if the hook was ingested.
- Long-handled net (equal or greater in length from the gunwale to the waterline). The diameter of the rim and depth of the net should be large enough to fit most adult sea turtles, and the hoop and handle should be strong enough so as not to bend or break when attempting to pull up heavy turtles.
- Long-handled dehooker (equal or greater in length from the gunwale to the waterline).

³ Freeboard is the distance between the vessel’s deck and the sea surface.

2.4. Gillnet and Set-net Fisheries

There is growing evidence that small-scale, coastal, and passive net fisheries may have the largest impact on some sea turtle populations (Gilman et al. 2010). In the Indian Ocean, the World Wildlife Fund (WWF-Pakistan) initiated a fisher-based observer program, inviting skippers of gillnet vessels to record data on the handling and releases of vulnerable species. These data revealed the challenges associated with releasing sea turtles and other vulnerable taxa captured in gillnets. During the consultation with fishers, the typical entanglement patterns were identified and the steps to disentangle them were created for sea turtles, large rays and whale sharks (Razzaque et al. 2020). The following BHRP recommendations for EPO gillnet fisheries are largely based on the recommendations developed for the Indian Ocean gillnet fishery by fishers participating in the program.

2.4.1. Recommended BHRP Guidelines for gillnet and set net fisheries

When a sea turtle is encountered in the net

Do:

- Stop the hauling operation and determine the degree of entanglement, the sea turtles position in the net and the size of the individual.
 - If the animal is alive and partially entangled, lessening the tension on the rope and net may allow the animal to disentangle itself.
 - If this does not work, determine whether or not the animal can be brought onboard safely.

Sea turtle is too large and cannot be hauled on board safely

Do:

- Support the weight of the net and the catch below the turtle during disentanglement and gear removal.
- Cut the fishing gear/lines from the turtle working from the mid-part of the shell towards its head. Make sure the flippers are also free from the fishing net/ropes.
- Leave as much of the net and lines intact as possible and avoid cutting in a manner where the turtle may be prematurely freed with gear still remaining on it.

2.4.2. Sea turtle that can be hauled on board safely

Do:

- Manually haul the sea turtle and fishing net onto the boat carefully. Make sure the turtle does not pass through the net hauler.
- Handle the sea turtle by the edges of its shell (carapace).
- Disentangle the sea turtle by cutting net/line working from the mid-part of the shell moving towards the head of sea turtle.
- Return the animal to the sea -on the opposite side of the vessel from the net- as soon as possible following the resuscitation and release guidelines in section 2.1.

Do not:

- Allow the sea turtle to reach the mechanical net hauler.

2.4.3. Tools required for Gillnet and Set-net Fisheries

The tools required for safely removing sea turtles from a gillnet or set-net are encompassed by the required tools in the 'All Fisheries' section 2.1.5.

3. TRAINING

For BHRPs to serve as an effective tool for mitigating mortality of vulnerable species, they must be fully integrated into standard fishing operations. This requires not only that fishers are aware of the preferred practices, but that they are also trained in their correct application. Equally important is educating fishers on practices that are prohibited or should be avoided due to their potential to cause harm.

Several IATTC Resolutions—including C-04-05 Rev 2, C-04-07 [C], and C-19-04—emphasize the importance of education and training in BHRPs. Resolution C-04-05 Rev 2 (paragraphs 8.b. and 8.c.) directs the IATTC staff to: *“educate fishermen through information dissemination activities, including distributing informational materials and organizing seminars on, inter alia, reducing bycatches of sea turtles and safe handling of incidentally caught sea turtles to improve their survivability.”*

Similarly, Resolution C-04-07 includes provisions that focus on industry education regarding proper handling techniques:

- **C.1. Preparation and distribution of informational materials:** *CPCs and the IATTC should continue to widely distribute materials to fishers operating in the EPO to support the safe handling of incidentally caught sea turtles and improve their survivability.*
- **C.2. Convening meetings for fishers:** *CPCs and the IATTC should continue and expand the organization of seminars to train fishers in appropriate handling techniques for incidentally caught sea turtles.*

In addition, Resolution C-19-04 requires that:

1.b. *“Vessel operators and/or at least one crew member on board vessels targeting species covered by the Convention, in fisheries that have reported sea turtle interactions—and particularly those without observers—must be trained in techniques for handling and releasing sea turtles to improve post-release survival.”*

These provisions collectively underscore the importance of widespread, ongoing training and outreach as essential components for the successful implementation of BHRPs in IATTC managed fisheries. Currently the IATTC has generated excellent educational videos for BHRPs of sea turtles in longline fisheries (<https://www.iattc.org/en-US/Resources/Videos>), which are of great use to trainers and fishers.

To comprehensively address the requirements outlined above, the IATTC staff proposes to generate standardized, official, outreach, education, and training materials for all IATTC fishing gears. This will include the creation of infographics to accompany adopted practices and the formulation of BHRP guideline ‘posters’ that can be posted visibly on all vessels in areas where crew are able to review them and short videos that can be distributed to fishers directly, for all vulnerable taxa in all fisheries (where appropriate). The timeline for development of these materials is proposed to begin immediately after the adoption of official BHRP guidelines. The timeframe for content creation is estimated to be one year from BHRP guideline adoption to posting and circulation. Training of the fishing crew will need to be continuous, with updated training material created as needed. IATTC staff can support CPCs with fisher or CPC training by creating training materials and by supporting, coordinating, (co)organizing and participating in training workshops, as required. These workshops are also an excellent opportunity to learn from fishers on potential techniques and strategies for either mitigating interactions or devising new BHRPs. This activity will require dedicated funding for infographics, content creation (i.e. videos) and training workshops.

4. RECOMMENDATIONS

Currently there are no single or combination of mitigation measures that are 100% effective in eliminating sea turtle bycatch in purse seine, hook and line or gillnet fisheries. Therefore, on those occasions when

sea turtles are captured it is important that crews are aware of, and correctly implement, the approved BHRP guidelines to improve the post release survival outcomes of sea turtle bycatch. As the guidelines available in the Annex of Resolution C-19-04 are based on the outdated FAO (2009) Best Practices document, and because the EBWG-3 recommended the updating of best practice guidelines for sea turtle handling and release practices for all fisheries under the competence of the Commission, the staff believes that an update to the BHRP guidelines in Resolution C-19-04 is needed. This document, prepared by the IATTC staff in consultation with CPCs, wildlife veterinarians, industry personnel and external experts has compiled BHRP guidance and the required tools for safely removing sea turtles from fishing gears used under the purview of the IATTC. Therefore, the IATTC staff recommends:

The Commission consider updating Resolution C-19-04 with the inclusion of the BHRP guidelines outlined herein (EB-04- 04) for all IATTC fisheries.

Because training fishers and fisheries agents is an integral component to the effective implementation of BHRP across fleets, it is necessary to develop clear, accessible educational materials tailored to diverse audiences, including infographics, posters, videos and placards for display on vessels and in port facilities, as well as associated training activities. Thus, the IATTC staff believes that support to create and deliver standardized “train-the-trainer” curricula is desirable. These programs can empower regional trainers, fisheries observers, and enforcement personnel with the knowledge and tools to ensure proper training on sea turtle BHRP to fishing crews and vessel operators, further enhancing capacity building and promotes ownership and understanding of existing conservation measures. Therefore, the IATTC staff recommends that:

The Commission ensures the necessary funding to support capacity building, the development of training materials and a range of education and outreach activities (unfunded project Q.3a).

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6. APPENDIX

For ease of reference and comparison, the following relevant supporting materials have been consolidated and appended below;

6.1 Resolution C-19-04 Appendix 1. Safe Handling and Release Guidelines for Sea Turtles

6.2 FAO (2009) Guidelines to reduce sea turtle mortality in fishing operations

6.2.1 BHRP for purse seine fisheries

6.2.2 BHRP for longline fisheries

6.3 Lists of tools for BHRP

6.3.1 FAO (2009) Guidelines to reduce sea turtle mortality in fishing operations

6.3.2 United States National Oceanic and Atmospheric Administration's list of required tools for longline fishing vessels

6.1. Resolution C-19-04 Appendix 1. Safe Handling and Release Guidelines 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. 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.
- c. 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.
- d. 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. 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.
- c. 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.
- d. If hooked externally or hook is fully visible, hooks should 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 should be cut as close to the hook as possible.

- e. 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.
- f. 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 and elevating its hindquarters at least 6 inches (15 cm) for a period of 4 up to 24 hours. The height of 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 (ensuring nostrils and mouth are clear), 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, 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.

6.2. FAO (2009)

6.2.1. Best practices for sea turtle handling and release in purse seine fisheries

If a turtle is caught, the following specific measures should be taken:

- (i) Whenever a sea turtle is sighted in the purse seine, all reasonable efforts should be made to rescue the turtle before it becomes entangled in the net, including, if necessary, the deployment of a speedboat.
- (ii) If a turtle is entangled in the net, hauling should stop as soon as the turtle comes out of the water and should not start again until the turtle has been disentangled and released.
- (iii) If a turtle is brought aboard the vessel, all appropriate efforts to assist in the recovery of the turtle should be made before returning it to the water.

6.2.2. Best practices for sea turtle handling and release in longline fisheries

Fishers should implement best practices for the handling (including resuscitation) and release of sea turtles caught in fishing gear. They should also carry on board their vessels the equipment necessary for implementing handling and release practices.

Much progress has been made in identifying best practices for handling and releasing turtles captured in pelagic longline fisheries. Various tools and techniques are required to remove fishing gear from captured sea turtles, reduce sea turtle injury and promote post-release survival.

The United States Government protocol for handling and releasing sea turtles caught in pelagic longline gear protocols (<https://www.fisheries.noaa.gov/resource/document/careful-release-protocols-sea-turtle-release-minimal-injury>) is divided into three parts:

- (i) Part 1: Vessel's responsibilities upon sighting a sea turtle;
- (ii) Part 2: Sea turtles not boated; and
- (iii) Part 3: Sea turtles boated.

The following is a summary of the United States turtle handling and release protocol.

Part 1: Vessel's responsibilities upon sighting a sea turtle

- Scan the line far ahead;
- avoid moving ahead of the mainline;
- upon sighting a turtle, slow vessel and line drum speed;
- if slow speed is not possible, stop the vessel;
- take engine out of gear;
- pull branch line slowly;
- do not use sharp objects to retrieve or control turtle;
- assess turtle's condition and size and whether it is hooked or entangled;
- there are three possible interactions: entangled but not hooked, hooked but not entangled, and hooked and entangled;
- if hooked, assess the location of the hook;
- vessel must be stopped for assessment and boating of turtle;
- turtles three feet (about 90 cm) in straight carapace length can be boated safely if sea conditions permit;
- larger turtles should be boated when conditions and equipment permit;
- if the turtle cannot be boated, follow Part 2 of the protocols;
- whenever possible, turtles should be boated and Part 3 of the protocols should be followed; and
- the vessel is responsible for the turtle's safety from the first sighting until release.

Part 2: Sea turtles not boated

- The turtle should be brought as close as possible, but it may need a short time to calm down;
- gear removal must be done quickly, however, careful removal to ensure no further injury is the top priority;
- a turtle control device or tether (a line on a pole that is looped over one flipper) can be used to help control the animal; it takes pressure off the branch line;
- long-handled line cutter is used to cut monofilament line from entangled turtles;
- monofilament cutter is used to cut line if the turtle is close to the boat;
- long-handled de-hooker for internal hooks is used to remove internal hooks from sea turtles that cannot be boated;
- long-handled de-hooker for external hooks is used to remove hooks from flippers; and
- long-handled device to pull an inverted V (a gaff or boat hook can be used for this during entanglement) is used to assist in cutting away line.

Part 3: Sea turtles boated

- It is important that the turtle is never pulled out of the water by using the branch line;
- If the turtle is small enough, a dip net can be used to carefully boat the turtle;
- For larger turtles, a hoist can be used;
- The hoist is a large basket-like device that is lowered and raised by a hydraulic crane or boom;
- While onboard, the turtle must be kept moist and in the shade, maintaining its body temperature above 60° F (15.5° C) or similar to the water temperature at capture;
- It must be isolated and immobilized on a cushioned surface; the hoist will do for larger turtles and an automobile tyre will do for smaller turtles;
- Comatose turtles should be revived before being released;
- They can be kept on deck for 24 hours without a permit for resuscitation purposes;
- A turtle kept on deck for 24 hours without sign of life may be considered dead and should be returned to the water;
- If it is uncertain whether hook removal will cause more damage, then the hook should not be removed;
- All external hooks should be removed;
- Hooks in the mouth should be removed;
- Hooks that have been swallowed should not be removed when the insertion point is not visible;
- When a hook cannot be removed, the line should be cut as close as possible to the eye of the hook;
- If part of the hook is visible, it should be cut with bolt cutters and removed;
- if the turtle is hooked internally, its mouth needs to be opened: block the nostrils, tickle the throat or cover the nostrils and apply light pressure to the front corner of the eye with one hand and firm pressure to the throat with the other;
- otherwise, use rope loops covered with protective tubing or the avian mouth speculum to open the mouth. Then use mouth gags (block of wood, canine mouth gags, hank of rope, PVC pipe couplings) to keep it open;
- to obtain a better view after the mouth is open, insert a pair of needle-nosed pliers (in the closed position) into the upper oesophagus and then open the pliers;
- use pliers, bolt cutters or short-handled de-hooker to remove internal hooks;
- use bolt cutters and pliers, or a short-handled de-hooker, to remove external hooks;
- once gear is removed and the turtle recovered, boated turtles should be released in water of similar temperature as at capture, preferably in a nonfishing area;
- release the turtle by lowering it over the aft portion of the vessel, close to the surface, when gear is not in use and the engine is in neutral; and
- the turtle's swimming behaviour and diving ability should be monitored after release and recorded in the daily logbook.

6.3. Tools for BHRP

6.3.1. The list of tools required according to the FAO (2009) Guidelines

The FAO (2009) document suggests using the equipment required for Atlantic longline vessels by the Government of the United States of America. The listed tools in the FAO document includes the following:

[a] long-handled line cutter,

- [b] long-handled de-hooker for ingested hooks,
- [c] long-handled de-hooker for external hooks,
- [c] long-handled device to pull an inverted V,
- [d] dip net,
- [e] standard automobile tyre,
- [f] short-handled de-hooker for ingested hooks,
- [g] short-handled de-hooker for external hooks,
- [h] long-nose, needle-nose pliers,
- [i] bolt cutter,
- [j] monofilament line cutter, and
- [k] different types of mouth openers and mouth gags (including either a block of wood or metal tube, a set of three canine mouth gags, a set of two sturdy dog chew bones, a set of two rope loops covered with hose, a hank of rope, a set of four PVC splice couplings, or a large avian oral speculum).

The list of United States Government-approved equipment for turtle handling and release can be found at <https://www.fisheries.noaa.gov/resource/outreach-materials/atlantic-highly-migratory-species-safe-handling-release-and> . This list has since been updated and the updated tool recommendations are provided below.

Figure 24. Best practices for (a) retrieving and (b) de-hooking turtles captured in pelagic longlines. (After Beverly, Chapman and Sokimi, 2003).



a) Retrieving a sea turtle

Assess the turtle's size, then release it or bring in on board. If the turtle is too large to bring on board, bring it as close to the boat as possible without putting too much strain on the line, then cut the line as close to the turtle as practical. If the turtle is small, use a dip net to lift the animal on board. **DO NOT** use a gaff and **DO NOT** pull on the line or grasp the eye sockets to bring the animal on board.



b) De-hooking a sea turtle

Place a piece of wood in the turtle's mouth so it cannot bite, then cut the hook or line. If the hook's barb is visible, use bolt cutters to cut the hook in half, and remove the two parts separately. If the hook is not visible, remove as much line as possible without pulling too hard on the line, and cut it as close to the turtle as practical.



FIGURE A.1. FAO (2009), Figure 24. Illustrated guidelines for dehooking sea turtles.

FIGURA A.1. FAO (2009), Figura 24. Directrices ilustradas para el desenganche de tortugas marinas.

6.3.2. The list of tools required according to US NOAA

The list of United States Government-approved equipment for turtle handling and release:

LONGLINE REQUIRED EQUIPMENT LIST
REDUCTION OF SEA TURTLE BYCATCH AND BYCATCH MORTALITY IN THE ATLANTIC LONGLINE FISHERY

REQUIRED FOR TURTLES NOT BOATED:

- A. (one) Long-handled line cutter.
- B. (one) Long-handled dehooker for internal hooks.
- C. (one) Long-handled dehooker for external hooks (the long-handled dehooker for internal hooks used for Item B will also satisfy this requirement).
- D. (one) Long-handled device to pull an "Inverted V" (if 6' J-style dehooker is used for Item C, it will also satisfy this requirement).

REQUIRED FOR TURTLES BOATED:

- E. (one) Dip net.
- F. (one) Standard automobile tire.
- G. (one) Short-handled dehooker for internal hooks.
- H. (one) Short-handled dehooker for removing external hooks (the short-handled dehooker for internal hooks use in Item G will also satisfy this requirement).
- I. (one pair) Long-nose or needle-nose pliers.
- J. (one) Bolt cutters.
- K. (one) Monofilament line cutter.
- L. (two) Mouth openers/mouth gags selected from the following list:
 - 1. Block of hard wood;
 - 2. A set of three (3) canine mouth gags;
 - 3. A set of two (2) sturdy dog chew bones;
 - 4. Two (2) rope loops covered with hose;
 - 5. A hank of rope;
 - 6. A set of four (4) PVC splice couplings;
 - 7. A large avian oral speculum.

RECOMMENDED EQUIPMENT:

- M. (one) Turtle tether.
- N. (one) Turtle hoist.