APPENDIX B1

REQUIREMENTS AND EQUIPMENT NEEDED FOR THE CAREFUL RELEASE OF SEA TURTLES CAUGHT IN HOOK AND LINE FISHERIES

NOAA FISHERIES
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Introduction

The following requirements and specifications have been prepared in consultation with NOAA Fisheries Southeast Fisheries Science Center. As specified in 50 CFR 635.21(c)(5)(I), they are intended to be used by all Atlantic vessels that have pelagic longline gear onboard and have been issued, or are required to have, Federal HMS limited access permits. The equipment specified in this document must be used in accordance with NOAA Fisheries' "Careful Release Protocols for Sea Turtle Release With Minimal Injury" (Epperly et al., 2004), which is required to be onboard all vessels issued a limited access swordfish, shark or tuna longline category permit. The purpose of this equipment is to increase post-release survival of incidentally-captured sea turtles by releasing them with minimal injury.

All U.S. pelagic longline vessels with Federal HMS permits have been required to carry dip nets and line clippers on board that meet NOAA Fisheries design and performance standards, and to comply with the equipment use standards for the handling of incidentally caught sea turtles (65 FR 60889, October 13, 2000, and 66 FR 17370, March 30, 2001). These requirements have been revised and expanded, based upon field-testing of equipment, user feedback, and product design updates resulting from recent experiments in the Northeast Distant (NED) statistical reporting area. Mandatory requirements and design specifications for the revised and newly required items are outlined below. All items identified as mandatory, for both boated and non-boated turtles, must be onboard HMS pelagic longline vessels.

This document contains the approved design standards for release gears. Example models of certified commercially available products are listed. Any item meeting the design standards may be constructed or purchased and used, as long as the design is first certified by the NMFS Pascagoula Laboratory. When new items are certified, a notice in the Federal Register will be published. Although these product design standards have been developed primarily with sea turtles in mind, many of the devices and techniques also are effective on other species of fish, marine mammals and seabirds and should be used, whenever possible, on all catch to be released.

Mandatory Equipment and Design Standards for Use with Sea Turtles that are not Boated

In circumstances where a sea turtle is too large to be boated, or conditions preclude the safe boarding of the animal, vessels are required to possess, maintain, and utilize the following equipment and release the turtle with minimal injury:

A) Long-handled line clipper/cutter. Line clippers or cutters are designed to cut high test monofilament line as close as possible to the hook and to assist in removing line from entangled sea turtles, in an effort to minimize remaining gear upon release. NOAA Fisheries has established minimum design standards for the line clippers (65 FR 16347, March 28, 2000, and 66 FR 17370, March 30, 2001) that can be purchased or fabricated using available and low cost materials. One long-handled line clipper or cutter and a set of replacement blades are required to

be onboard. These minimum design standards for line clippers or cutters have been modified based on experiments in the Northeast Distant statistical reporting area, and are as follows:

(1) Design Standards:

(i) *A protected and secured cutting blade*. The cutting blade(s) must be capable of cutting 2.0-2.1 mm monofilament line (400 # test) or polypropylene multi strand material, known as braided or tarred mainline, and should be maintained in working order. The blade must be curved, recessed, contained in a holder, or otherwise designed to facilitate its safe use so that direct contact between the cutting surface and the sea turtle or the user is prevented. The cutting instrument must be securely attached to an extended reach handle and easily replaced. One extra set of replacement blades meeting these standards must also be carried on board to replace all cutting surfaces on the line cutter or clipper;

(ii) *Extended reach handle*. The line cutter blade must be securely fastened to an extended reach handle or pole with a minimum length equal to or greater than 150% of the freeboard or a minimum of 6', whichever is greater. Freeboard is defined here as the working distance between the top rail of the gunwale to the water's surface and will vary based on the vessel design. For flexibility of configuration during use and for storage purposes, it is recommended that the handle break down into sections, although this is not a requirement. There is no restriction on the type of material used to construct this handle as long as it is sturdy and facilitates the secure attachment of the cutting blade.

(2) Models meeting current design standards:

(i) *NOAA/Arceneaux Line Clipper (Figure 1)*. The NOAA/Arceneaux line clipper can be fabricated by securely attaching a flat hardened stainless steel seat belt cutter with recessed cutting blades (such as the Emergency Seat Belt Cutter, Lifesaver Seat Belt Cutter™ or similar) to an extended reach handle using bolts and/or cable ties. A replacement blade set would require one additional seat belt cutter for the NOAA/Arceneaux Line Clipper;

(ii) *NOAA/Laforce Line Cutter (Figure 2)*. The Laforce Line Cutter has a cutting end manufactured from a 6" long ½" aluminum rod with a 4 1/8" end at a 45° angle with (2) 420 C stainless steel serrated cutting blades secured inside the angle. It must be attached to an extended reach handle. A set of replacement blades would require (2) stainless steel serrated cutting blades for the NOAA/Laforce Line Cutter.

B) *Long-handled dehooker for internal hooks.* A long-handled dehooking device designed to remove internal hooks from sea turtles that cannot be boated is required. Because this design shields the barb of the hook and prevents it from re-engaging, this device is also to be used to engage a loose hook when the turtle is entangled, but not hooked, and line is being removed. One long handled device to remove internal hooks is required onboard. Minimum design standards are as follows:

1) Design Standards:

(i) *Hook removal device.* The hook removal device should be constructed of 5/16" 316 L stainless steel and have a dehooking end no larger than 1 7/8" outside diameter. This device must securely engage and control the leader while shielding the barb to prevent the hook from re-engaging during removal. It cannot have any unprotected terminal points (even blunt ones), as these could cause injury to the esophagus during hook removal. The device must be of a size appropriate to secure the range of hook sizes and styles observed to date in the pelagic longline fishery targeting swordfish and tuna, or those having anticipated use in the future (7/0-11/0 J hooks and 13/0-22/0 circle hooks);

(ii) *Extended reach handle*. The dehooking end must be securely fastened to an extended reach handle or pole with a minimum length equal or greater than 150% of the freeboard or a minimum of 6', whichever is greater. Freeboard is defined here as the working distance between the top rail of the gunwale to the water's surface and will vary based on the vessel design. For flexibility of configuration during use and for storage purposes, it is recommended that the handle break down into sections, although this is not a requirement. There is no restriction on the type of material used to construct this handle as long as it is sturdy and facilitates the secure attachment of the hook removal device.

2) Models meeting current design standards:

(i) *ARC Pole Model Deep-Hooked Dehooker Model BP11 (Figure 8A).* This device is constructed of a 5/16" 316 L stainless steel rod curled into a pigtail spiral loop end with no exposed terminal point. The rod is 7" from point of attachment to the end of the loop, and includes a 13° angle offset to create a 1/8" gap between rod and loop to facilitate line engagement. The loop is designed at a 24° angle bend from the rod and has an inside diameter of 1 ¼ " and an outside diameter of 1 7/8". It may be purchased with a 3-part anodized aluminum pole (12') that breaks down into 4' sections for storage. This item is covered under U.S. Patent # 4,914,853 and U.S. Design Patent # 382,628 held by Aquatic Release Conservation of Ormond Beach, FL;

(ii) *ARC 6' Pole Big Game Dehooker Model P610.* See Section (B)(2)(i) above for a description of this item and patent information. This model has a fixed length 6' anodized aluminum handle with a "T" handle.

C) *Long-handled dehooker for external hooks.* A long-handled dehooker is required for use on externally hooked sea turtles that cannot be boated. One of these types of long- handled devices to remove external hooks is required onboard. The long-handled dehooker for internal hooks used for Item B will also satisfy this requirement. Minimum design standards are as follows:

(1) Design Standards:

(i) *Hook removal device.* The dehooker should be constructed of 5/16" 316 L stainless steel rod. A 5" tube T-handle of 1" outside diameter is recommended. The design should be

such that the hook can be rotated out without pulling it out at an angle. The dehooking end should be blunt and all edges rounded. The device must be of a size appropriate to secure the range of hook sizes and styles observed to date in the pelagic longline fishery targeting swordfish and tuna, or those having anticipated use in the future (7/0-11/0 J hooks and 13/0-22/0 circle hooks);

(ii) *Extended reach handle.* The handle must be a minimum length equal to the freeboard of the vessel or 6', whichever is greater. Freeboard is defined here as the working distance between the top rail of the gunwale to the water's surface and will vary based on the vessel design.

(2) Models meeting current design standards:

(i) *Any 6' or greater J-Style Dehooker or "Flip Stick" [e.g., ARC Model LJ6P (6') (Figure 3 and 8A)].* This item is constructed according to the specifications above [Section (C)(1)(I)] with a 1" dehooking end at a 45° angle to the rod forming a "J" shape;

(ii) *ARC Pole Model Deep-Hooked Dehooker Model BP11 (Figure 8A).* See Section (B)(2)(I) for description;

(iii) *ARC 6' or greater Pole Big Game Dehooker Model P610.* See Section (B) (2) (ii) for description;

(iv) *Scotty's Dehooker (Figure 4 and 8B).* This device has (2) 1 ¼" long prongs at the end to form a ¾" wide fork.

D) *Long-handled device to pull an "Inverted V."* The primary use for this tool is to pull a "V" when implementing the "Inverted V" dehooking technique for disentangling and dehooking entangled sea turtles. One long-handled device to pull "Inverted V" is required onboard. If 6' J-Style Dehooker is used for Item C, it will also satisfy this requirement. Minimum design standards are as follows:

(1) Design Standards:

(i) *Hook end.* The device, such as a boat or gaff hook, should be constructed of stainless steel or aluminum. The semicircular or "J" shaped end must be securely attached to a handle. A sharp point, such as a gaff hook, is only to be used in holding the monofilament line and should never contact the sea turtle;

(ii) *Extended reach handle.* The handle must be a minimum length equal to the freeboard of the vessel or 6', whichever is greater. Freeboard is defined here as the working distance between the top rail of the gunwale to the water's surface and will vary based on the vessel design.

(2) Example models meeting current design standards:

(i) *Any 6' or greater long-handled J-Style Dehooker or "Flip Stick" [e.g., ARC Model LJ6P (6') (Figure 3 and 8A)]* See Paragraph (C)(2)(I) above for a description;

(ii) *Any standard boat hook (e.g., Davis Telescoping Boat Hook to 96" Model 85002A;*

(iii) *Any standard fishing gaff [e.g., West Marine # F6H5 hook and # F6-006 Handle (Figure 8A)]*.

Mandatory Equipment and Design Standards for Use with Sea Turtles That Are Boated.

Whenever possible, sea turtles must be brought on board immediately and handled in accordance with the procedures outlines in the standards for the handling of incidentally caught sea turtles [50 CFR 223.206 (d)(1)], unless extreme sea conditions prevent the crew from safely boating the turtle. Generally, all turtles < 3' straight carapace length should be boated. Vessels are required to possess, maintain, and utilize the following equipment and release the turtle with minimal injury. The following gears are required:

(E) *Dip net*. A dip net is required to facilitate safe handling of sea turtles by allowing them to be brought onboard for gear removal without causing further injury to the animal. The turtle should never be brought onboard without a net. Using the line to raise the turtle may result in serious injury and impact post-release survivorship, especially in cases where the turtle has ingested the hook. NMFS has established minimum design standards for the dip nets (65 FR 16347, March 28, 2000 and 66 FR 17370, March 30, 2001). These minimum design standards for dip nets are as follows and are modified based on experiments in the Northeast Distant statistical reporting area. One dip net is required onboard. Minimum design standards are as follows:

(1) Design Standards:

(i) *Size of dip net*. The dip net must have a sturdy net hoop of at least 31" inside diameter and a bag depth of at least 38" to accommodate turtles below 3' carapace length. The bag mesh openings may not exceed 3" x 3". There should be no sharp edges or burrs on the hoop or where it is attached to the handle. There is no requirement for the hoop to be circular as long as it meets the minimum specifications;

(ii) *Extended reach handle.* The dip net hoop must be securely fastened to an extended reach handle or pole with a minimum length equal to or greater than 150% of the freeboard or a minimum of 6', whichever is greater. Freeboard is defined here as the working distance between the top rail of the gunwale to the water's surface and will vary based on the vessel design. For flexibility of configuration during use and for storage purposes, it is recommended that the handle break down into sections, although this is not a requirement. There is no restriction on the type of material used to construct this handle, as long as it is sturdy enough to support a

minimum of 100 lbs without bending or breaking, and facilitates the sturdy attachment of the net hoop.

(2) Example models meeting current design standards:

(i) *ARC 12' Breakdown Lightweight Dip Net Model DN6P (6'), DN08 (8') or DN14 (12') or ARC Net Assembly (hoop, net, coupling-DNIN) and handle (Figure 5 and 8D).* This dip net is constructed of a hollow heavy duty aluminum tubing to form a 97" circumference hexagonal frame, and the 38" bag is 2 ½" square nylon mesh;

(ii) *Lindgren-Pitman, Inc. Model NMFS-Turtle Net.* This dip net is constructed of heavy duty stainless steel tubing to form a 31" diameter circular frame with a 45" bag of 2" square nylon mesh.

(F) ***A standard automobile tire.*** A tire is required for supporting the turtle while it is onboard. If the turtle is too large for the tire, it must be contained and supported on a cushioned surface. A minimum of one tire is required onboard, although an assortment of sizes is recommended to accommodate a range of turtle sizes.
Minimum design standards are as follows:

(1) Design Standards

(i) The tire should be a standard passenger vehicle tire, not from a truck or heavy equipment, and should be free of exposed steel belts.

(2) Example models meeting current design standards:

(i) *Any standard automobile tire that is free of exposed steel belts*.

(G) ***Short-handled dehooker for internal hooks.*** This dehooker is designed to remove internal hooks from boated sea turtles, including hooks in the front of the mouth, as well as external hooks. One short-handled device for removing internal hooks is required onboard. Minimum design standards are as follows:

(1) Design Standards:

(i) *Hook removal device.* The 1/4" 316 L stainless steel end must allow the hook to be secured and the barb to be shielded without re-engaging during the removal process. It must be no larger than 1 5/16" outside diameter. It cannot have any unprotected terminal points (even blunt ones) as this could cause injury to the esophagus during hook removal. A sliding PVC bite block must be used to protect the beak and facilitate hook removal if the turtle bites down on the dehooking device. The bite block should be constructed of a ¾" inside diameter high impact plastic cylinder (*e.g.*, Schedule 80 PVC) that is 10" long to allow for 5" of slide along the shaft. The device must be of a size appropriate to secure the range of hook sizes and styles observed to date in the pelagic longline fishery targeting swordfish and tuna, or those having anticipated use

in the future (7/0-11/0 J hooks and 13/0-22/0 circle hooks);

(ii) *Handle length*. The handle should be 16"- 24" long with a ~ 5" long tube T-handle of ~ 1" diameter recommended.

(2) Example models meeting current design standards:

(i) *16" Hand Held (sleeved) Bite Block Deep-Hooked Turtle ARC Dehooking Device Model ST08 (Figure 8B).* This device is constructed of a ¼" 316 L stainless steel rod curled into a pigtail spiral loop end. The loop is placed at a 13° angle offset to create a 1/8" gap between rod and loop to facilitate line engagement. The loop is designed at a 24° angle bend from the rod, and an inside diameter of 13/16" and an outside diameter of 1 5/16". This item is covered under U.S. Patent Pending # 10/712, 731, International Patent Pending # PCT/US2003/036233 held by Aquatic Release Conservation of Ormond Beach, FL.

(H) ***Short-handled dehooker for external hooks.*** These dehookers are designed for use when the hook is external, or when hooks are located in the front of the mouth. One of these types of short handled devices for removing external hooks is required onboard. The short handled dehooker for internal hooks used for Item G will also satisfy this requirement. Minimum design standards are as follows:

(1) Design Standards:

(i) Hook removal device. The dehooker should be constructed of 5/16" 316 L stainless steel, and the design should be such that the hook can be rotated out without pulling it out at an angle. The dehooking end should be blunt and all edges rounded. The device must be of a size appropriate to secure the range of hook sizes and styles observed to date in the pelagic longline fishery targeting swordfish and tuna, or those having anticipated use in the future (7/0-11/0 J hooks and 13/0-22/0 circle hooks);

(ii) *Handle length.* The handle should be 16"-24" long with a ~5" long tube T-handle of ~1" diameter recommended.

(2) Example models meeting current design standards:

(i) *The "J-Style Dehooker" [e.g., ARC Hand Held Large J-Style Dehooker Model LJ07 or LJ24 (Figure 3, 8A & B)]*. See description in Section (C)(2)(I) above;

(ii) *16" Hand Held (sleeved) Bite Block Deep-Hooked Turtle ARC Dehooking Device Model ST08 (Figure 8B).* See description in Section (G)(2)(I) above;

(iii) *The "Scotty's Dehooker (Figure 4 and 8B)."* See description in Section (C)(2)(iv) above.

(I) ***Long-nose or needle-nose pliers.*** Long-nose or needle-nose pliers can be used to assist in

removal of hooks that are deeply embedded in the animal's flesh and must be twisted during removal, or for removing hooks from the front of the mouth. They are also useful in holding PVC splice couplings in place when used as mouth openers. One pair of pliers is required onboard. Minimum design standards are as follows:

(1) Design Standards:

(i) *General.* They should be ~ 12" in length. It is recommended that these be of stainless steel material.

(2) Example models meeting current specifications:

(i) *Any 12" Long-nose or Needle-nose pliers* [*e.g., 12" S.S. NuMark Model #030 281 109 871 (Figure 8C)]*.

(J) ***Bolt cutter***. Bolt cutters are essential for removing hooks, and must be of a size practical to be used inside the turtle's mouth. They are used to cut off the eye or barb so that the hook can be pushed through easily without causing further injury to the sea turtle. They also are used to cut off as much of the hook as possible when the remainder cannot be removed. One pair of bolt cutters is required onboard. Minimum design standards are as follows:

(1) Design Standards:

(i) *General*. They should be ~ 14-17" in total length, 4" long blades that are 2 ¼" wide (closed) with 10-13" long handles. They must be able to cut hard metals such as stainless or carbon steel hooks up to 1/4" diameter.

(2) Example models meeting current design standards:

(i) *Any bolt cutters meeting design standards [e.g., H.K. Porter Model 1490 AC (Figure 8C)]*.

(K) ***Monofilament line cutter.*** Monofilament line cutters must be used to remove line as close as possible to the eye of the hook in the event that the hook was swallowed, or when the hook cannot be removed. This reduces the amount of gear retained by the animal in the event that the hook cannot safely be removed. One pair of monofilament cutters is required onboard. Minimum design standards are as follows:

(1) Design Standards:

(i) *General*. These should be ~ 7 ½" in length with 1 ¾" long, 5/8" wide (closed) blades, preferably Teflon ® (a trademark owned by E.I. Dupont de Nemours and Company Corp.) coated.

(2) Example models meeting current design standards:

(i) *Any monofilament cutters meeting design standards [e.g., Jinkai Model MC-T (Figure 8C)]*.

(L) Mouth openers and mouth gags (Figure 8E). In many cases, a mouth opener or gag must be used in order to remove internal hooks from boated turtles. It must be designed to allow access to the hook or line without causing further injury to the turtle. It is recommended that at least one type allow for hands-free operation of the gear removal devices once the gag is in place (only the canine mouth gag satisfies this recommendation, see item (2) below). Design standards are included in the item description. A minimum of 2 of the 7 different types/categories of mouth openers/gags from the following list is required onboard:

(1) *A block of hard wood*. A smooth block of hard wood is an inexpensive, effective and practical mouth-gagging device that meets these requirements and is readily available on most vessels. Placed in the corner of the jaw, it is used to gag open the mouth. The wood should be of a type that does not splinter (e.g., maple) with rounded edges, and it should be sanded smooth, if necessary, and soaked in water to soften the wood. The dimensions should be approximately 11" x 1" x 1". Any block of hard wood meeting these specifications is acceptable. A long-handled, wire shoe brush with a wooden handle and the wires removed is an inexpensive, effective and practical device that meets these requirements (e.g., *Olympia Tools Long-Handled Wire Brush and Scraper #974174);*

(2) *A Set of (3) Canine mouth gags*. The use of canine mouth gags is highly recommended as one of the categories used to hold the mouth open, as the gag locks into the open position and allows for hands free operation once it is in place. A set of canine mouth gags must include one of each of the following sizes: small (~5"), medium (~6"), and large (~7"). They must be constructed of stainless steel. A set includes one of each size and can be purchased through veterinary supply businesses. An example set meeting these specifications is *Jorvet Model #4160, 4162, and 4164;*

(3) *A set of (2) sturdy dog chew bones.* These "chew toys" are inexpensive, easy to handle, and sold in several sizes in pet stores. Placed in the corner of the jaw, it is used to gag open the mouth. They should be designed of durable nylon or thermoplastic polymer, strong enough to withstand biting without splintering. One large (e.g., "Giant" 8" or "Wolf" 5 ½") and one small (e.g., "Regular" 4 ½" or "Petite" 3 ½") are required to accommodate a variety of beak sizes. Example models meeting current specifications include: Nylabone® (a trademark owned by T.F.H. Publications, Inc.); Gumabone® (a trademark owned by T.F.H. Publications, Inc.); and Galileo® dog chew (a trademark owned by T.F.H. Publications, Inc.);

(4) *A set of (2) rope loops covered with hose*. A set consists of two pieces of poly braid rope covered with light duty garden hose each tied or spliced into a loop to provide a one-handed method for keeping the mouth open. The upper loop gives the user control using one hand, and the second rope/hose length is secured on lower beak using the user's foot for extra control.

This keeps the mouth open to allow access to the hook and/or line. Two 36” lengths of poly-braid rope (3/8” diameter suggested) should be covered with an 8” section of ½” or ¾” light duty garden hose and each tied or spliced into 2 loops. Any set of rope loops covered with hose meeting these specifications is acceptable;

(5) *A hank of rope.* A lanyard of braided nylon rope can be folded to create a hank of rope. Placed in the corner of the jaw, it is used to gag open the mouth. A 6’ lanyard of approximately 3/16” braided nylon rope can be folded to create a hank of rope. Any size soft braided nylon rope is acceptable, provided it creates a hank of approximately 2-4” thickness;

(6) *A set of (4) PVC splice couplings.* Inexpensive PVC couplings can be positioned inside the mouth to allow access to the back of the mouth. They should be held in place with the needle-nose pliers. Standard Schedule 40 PVC couplings in a variety of sizes (1”, 1 ¼”, 1 ½”, and 2”) are required to ensure proper fit and access. A set includes all 4 sizes;

(7) *A large avian oral speculum*. An avian oral speculum gives you the ability to hold the mouth open and control the head with one hand while removing the hook with the other hand. This tool is for use only on small turtles, as larger turtles may be able to crush the speculum. The avian oral speculum must be 9" long, and constructed of 3/16" wire diameter surgical stainless steel (Type 304). It must be covered with 8" of clear vinyl tubing (5/16" outside diameter, 3/16" inside diameter) . These can be purchased through veterinary supply businesses. Example models meeting these specifications include: Model # 85408 from Webster Vet Supply; VSP # 216-08 from Veterinary Specialty Products; Jorvet Model J-51z; and Krusse Model 273117.

Recommended, but not Required, Equipment and Design Standards

M) ***Turtle tether (also know as a “Flipper Gripper”)***. A turtle tether is highly recommended to reduce any safety risks associated with removing gear from an active sea turtle not boated, particularly leatherbacks. Its function is to “noose” the front flipper of the sea turtle so that the animal can be controlled at the side of the vessel while the gear is removed. This will facilitate rapid gear removal from the animal while reducing the chances that taut monofilament line could snap under the strain of the active sea turtle and recoil towards the crew members on deck. One tether is recommended onboard. Recommended minimum design standards are as follows:

(1) Design Standards:

(i) *Line.* 20’ of ½” hard lay negative buoyancy line is used to make a ~30” loop to slip over the flipper. A 19” section of hollow plastic tubing with an inside diameter of 5/8” and an outside diameter of ¾” should be placed on the line adjacent to the pole to help stabilize the loop in the water. The line is fed through a ¾” fair lead at the end of a pole, and through (2) ¾” eye bolts in the midsection to control the line so that it can be held securely in the cleat. A ½” quick release clam cleat holds the line in place near the end of the handle;

(ii) *Extended reach handle.* A handle is needed with a minimum length equal to or greater than 150% of the freeboard or a minimum of 6', whichever is greater. Freeboard is defined here as the working distance between the top rail of the gunwale to the water's surface and will vary based on the vessel design. There is no restriction on the type of material used to construct this handle as long as it is sturdy. The handle must include a tag line to attach the tether to the vessel, preventing the turtle from breaking away with the tether still attached.

(2) Example models meeting current design standards:

(i) *ARC Turtle Tether Model TT08 (8') or TT12 (12') (Figure 6 and 8A).*

(N) ***Large turtle hoist.*** A hoist is recommended to bring turtles onboard that cannot be boated using a smaller dip net. Recommended minimum design standards are as follows:

(1) Design Standards:

(i) *General*. The hoist should be designed so that when onboard, the turtle is suspended above the deck on a platform of mesh netting supported by a rigid ring, and contained within a webbing fence a minimum of 18" high. The top 2 rings (1 ¾" 50 series aluminum round bar) should be ~7'6" in diameter, and the bottom ring (1 ½" 50 series aluminum round bar) should be ~4' in diameter. The middle and bottom rings are connected using 12 angled (~25°) spoke braces of ~23" (1" 50 series aluminum round bar or 6061 T6 1" Schedule 40 pipe) welded in place with an appropriate welding wire (5052, 6061 or 3003 wire). Knotless polypropylene 8 mm 600 ply netting, 6.5" stretch is stretched across the middle ring. The fence is supported by the top and middle rings, which are connected by a 3mm, 4.7" stretch mesh braided polyethylene webbing to create a fence a minimum of 18" high, wrapped along the top ring with ½" polypropelene rope. 8" x 2 ½" rubber cookies (4 per each of 12 sections) can be used on the middle ring to facilitate rolling the hoist up the side of the vessel and to cushion impact of hoist against the side of the vessel. In rough seas, a vang is necessary to hold the hoist close to side of vessel. A 3 or 4 point bridle is attached to the top ring using pairlinks and 3/4" nylon 3 strand line, and a hydraulic lift is used to bring hoist aboard. The hoist needs to be capable of lifting a minimum of ½ ton.

(2) Example models meeting current design standards:

(i) *Leatherback Hoist (Figure 7).* This hoist was designed to bring leatherbacks onboard following the above specifications. Modifications to the vessel will likely be necessary to install the hoist, including: a platform to house the lift, alterations to the boom including strongback, pivoting gooseneck, hydraulic ram attachment & reinforcement, hydraulic ram, hydraulic runs, or a duel winch arrangement, and for safe lifting, a 2200 PSI planetary hydraulic winch with hydraulic runs, control and rigging (SS wire and blocks). A patent application has been filed for this hoist.

References Cited in Appendix B1

Epperly, S., L. Stokes, and S. Dick. 2004. Careful Release Protocols for Sea Turtle Release with Minimal Injury**.** National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Fisheries Science Center Technical Memorandum # 524.

Hataway, D. and S. Epperly. 2004. Removing Fishing Gear from Longline Caught Sea Turtles. http://www.sefsc.noaa.gov/seaturtlefisheriesobservers.jsp. Video. National Marine Fisheries Service, Southeast Fisheries Science Center, Miami, FL.

VESSEL EQUIPMENT LIST

REQUIRED FOR TURTLES NOT BOATED:

A- (1) Long-handled line cutter.
B- (1) Long-handled dehooker for internal hooks.
C- (1) Long-handled dehooker for external hooks (The long-handled dehooker for internal hooks used for Item B will also satisfy this requirement).
D- (1) 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- (1) Dip net.
F- (1) Standard automobile tire.
G- (1) Short-handled dehooker for internal hooks.
H- (1) Short-handled dehooker for removing external hooks (The short- handled dehooker for internal hooks used for Item G will also satisfy this requirement).
I- (1) Long-nose or needle-nose pliers.
J- (1) Bolt cutter.
K- (1)Monofilament line cutter.
L- (2) Types of mouth openers/mouth gags from the following list:

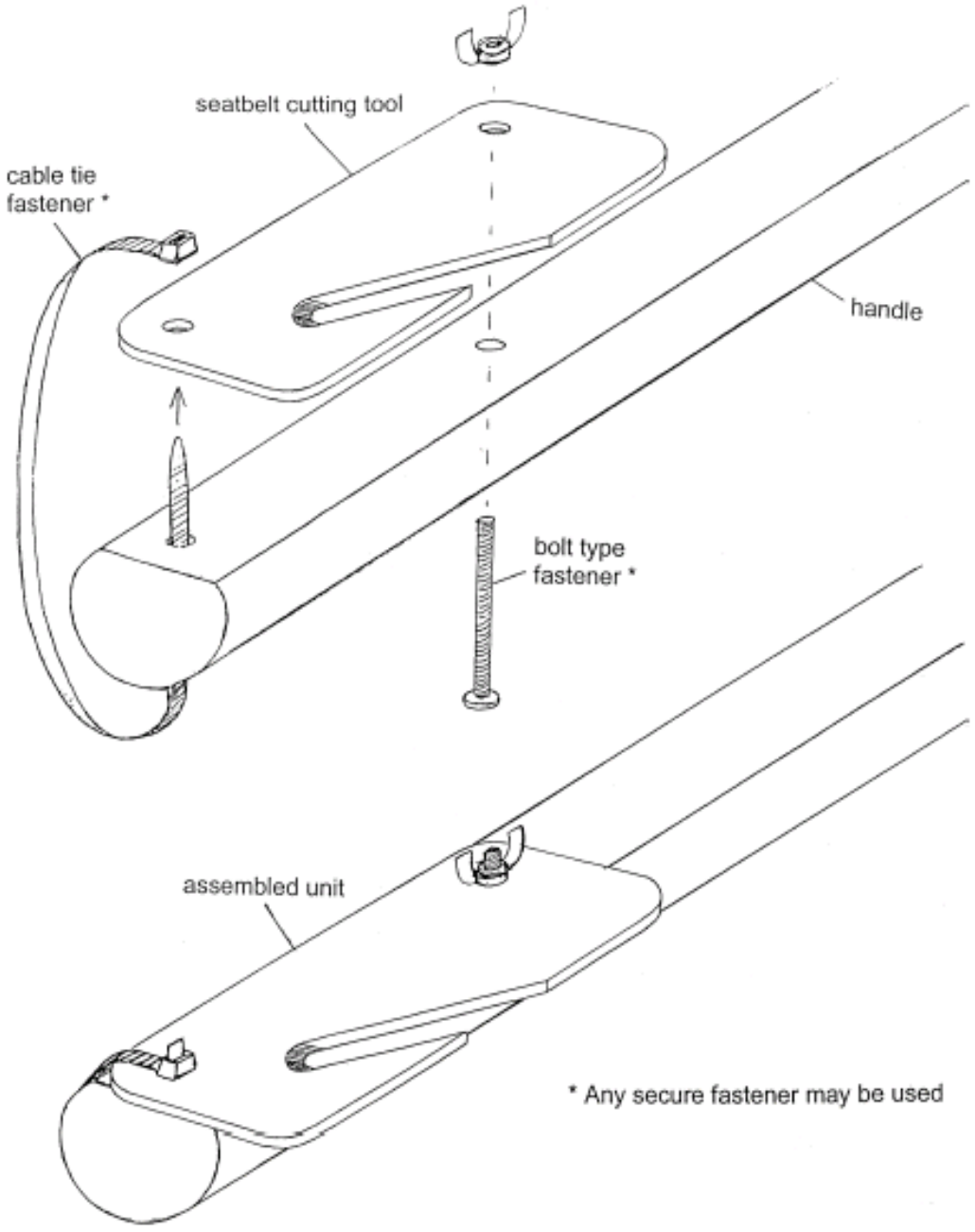
1) A block of hard wood;
2) A set of (3) canine mouth gags;
3) A set of (2) sturdy dog chew bones;
4) (2) rope loops covered with hose;
5) A hank of rope;
6) A set of (4) PVC splice couplings;
7) A large avian oral speculum.

RECOMMENDED EQUIPMENT:

(M)-(1) Turtle tether.
(N)- (1) Turtle hoist.

FIGURE 1

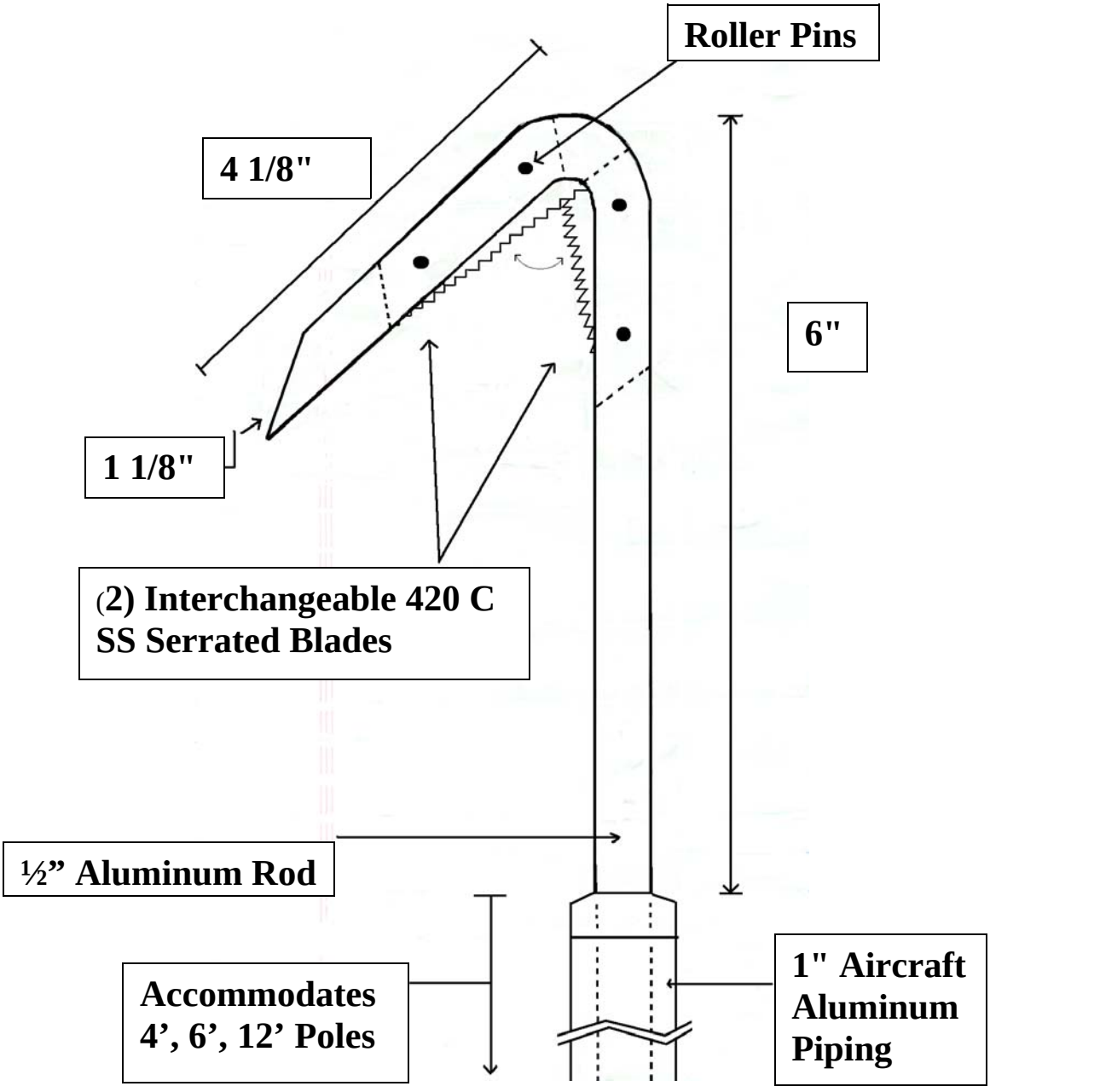
NOAA/ARCENEAUX LINE CLIPPER



50 CFR 660.33 Ch. VI (10-1-02 Edition)
[65 FR 16347, Mar. 28, 2000, as amended at 67 FR 40236, June 12, 2002; 67 FR 48576, July 25, 2002]

FIGURE 2

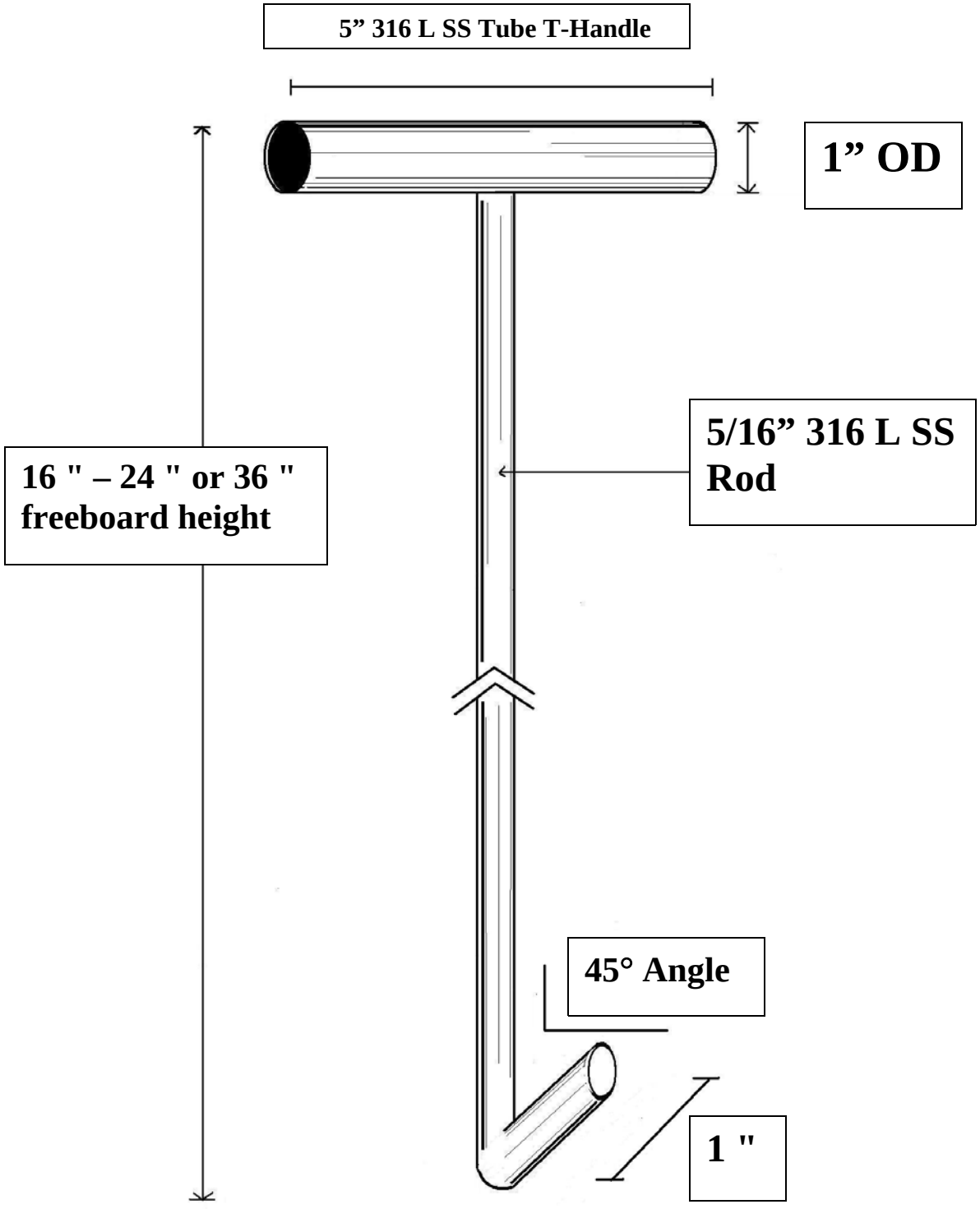
NOAA/LAFORCE LINE CUTTER



Drawn by S. Dick

FIGURE 3

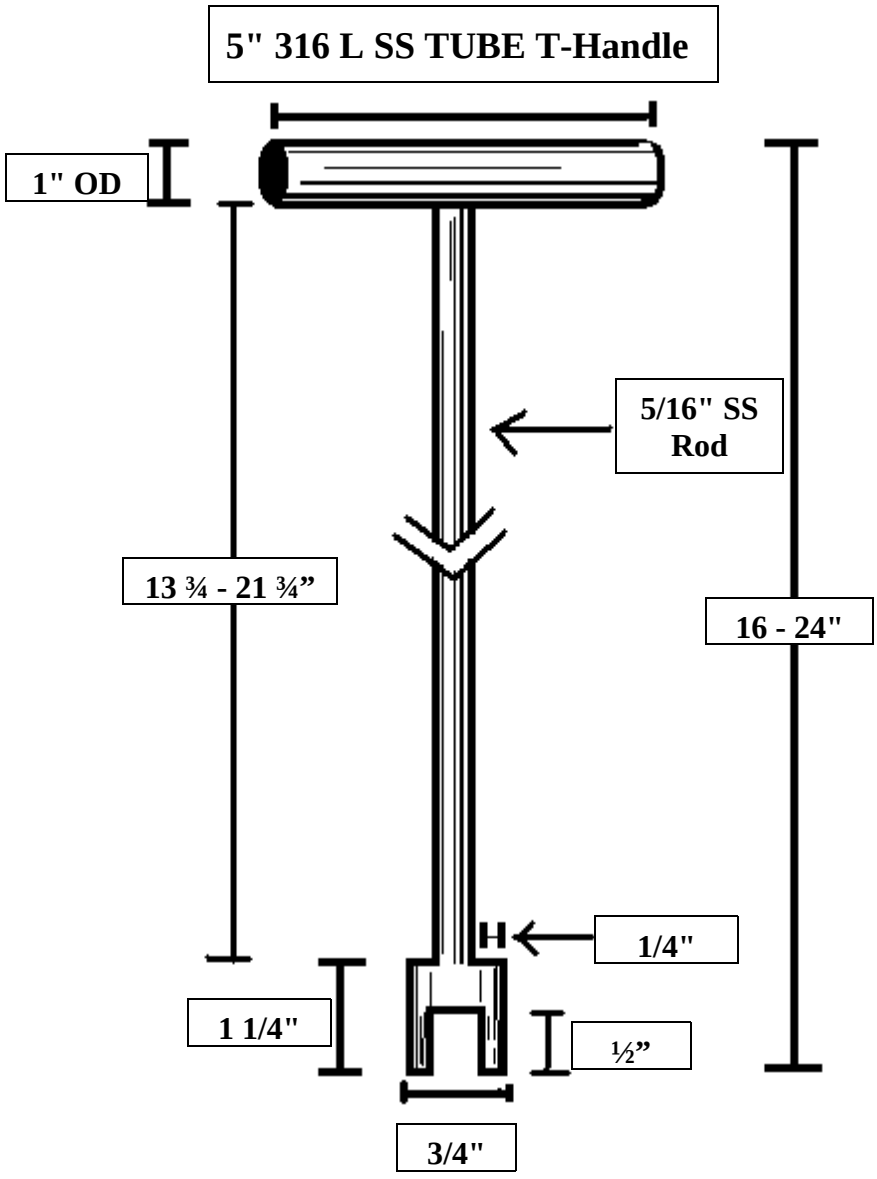
J- STYLE DEHOOKER



Drawn by S. Dick

FIGURE 4

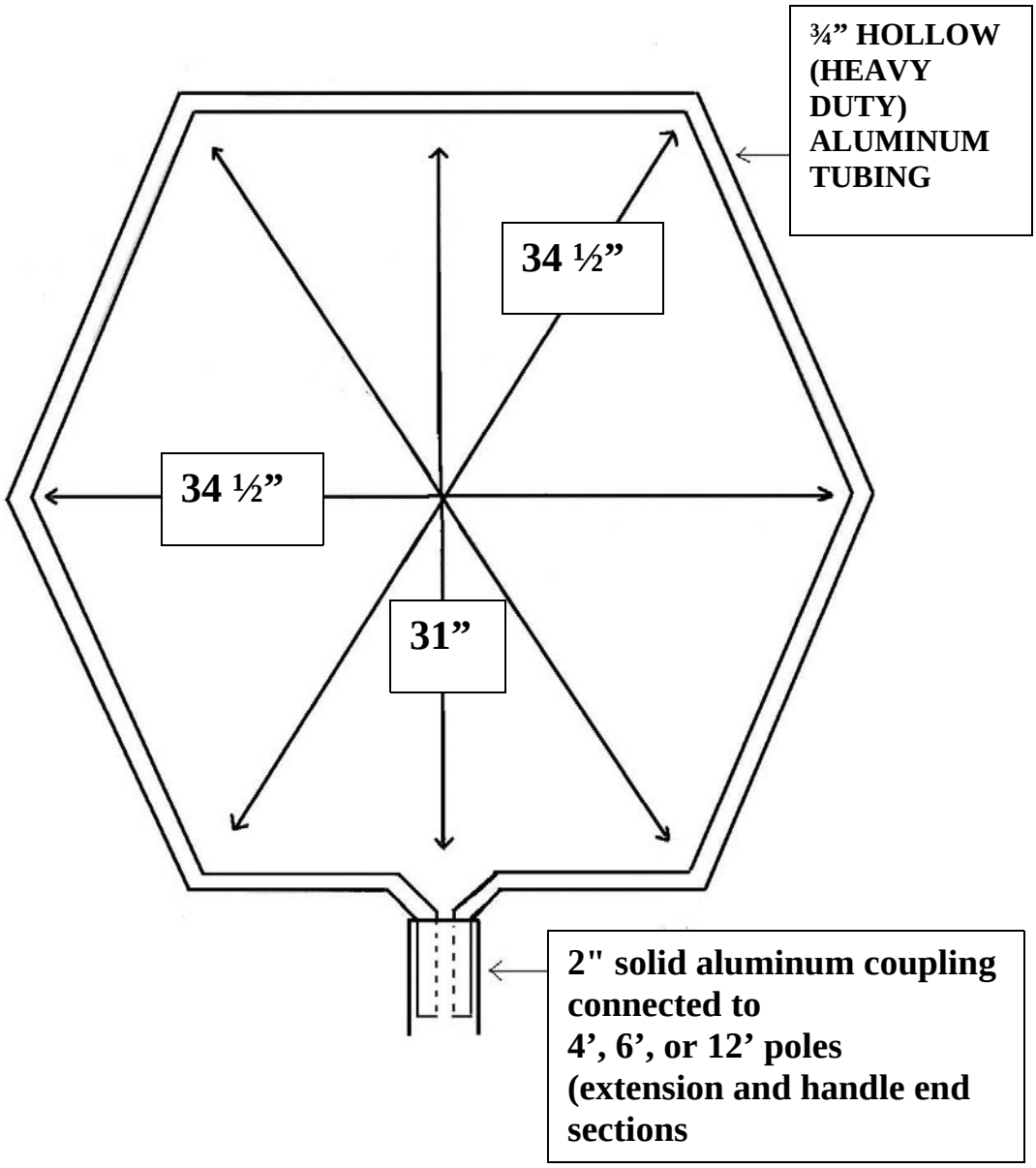
SCOTTY'S DEHOOKER



Drawn by S. Dick

FIGURE 5

LIGHTWEIGHT DIP NET



97"circumference 2 ½" square nylon mesh, with 38" bag depth (coated/dipped) knotless webbing

Drawn by S. Dick

Figure 6

Turtle Tether

Drawn by S. Dick

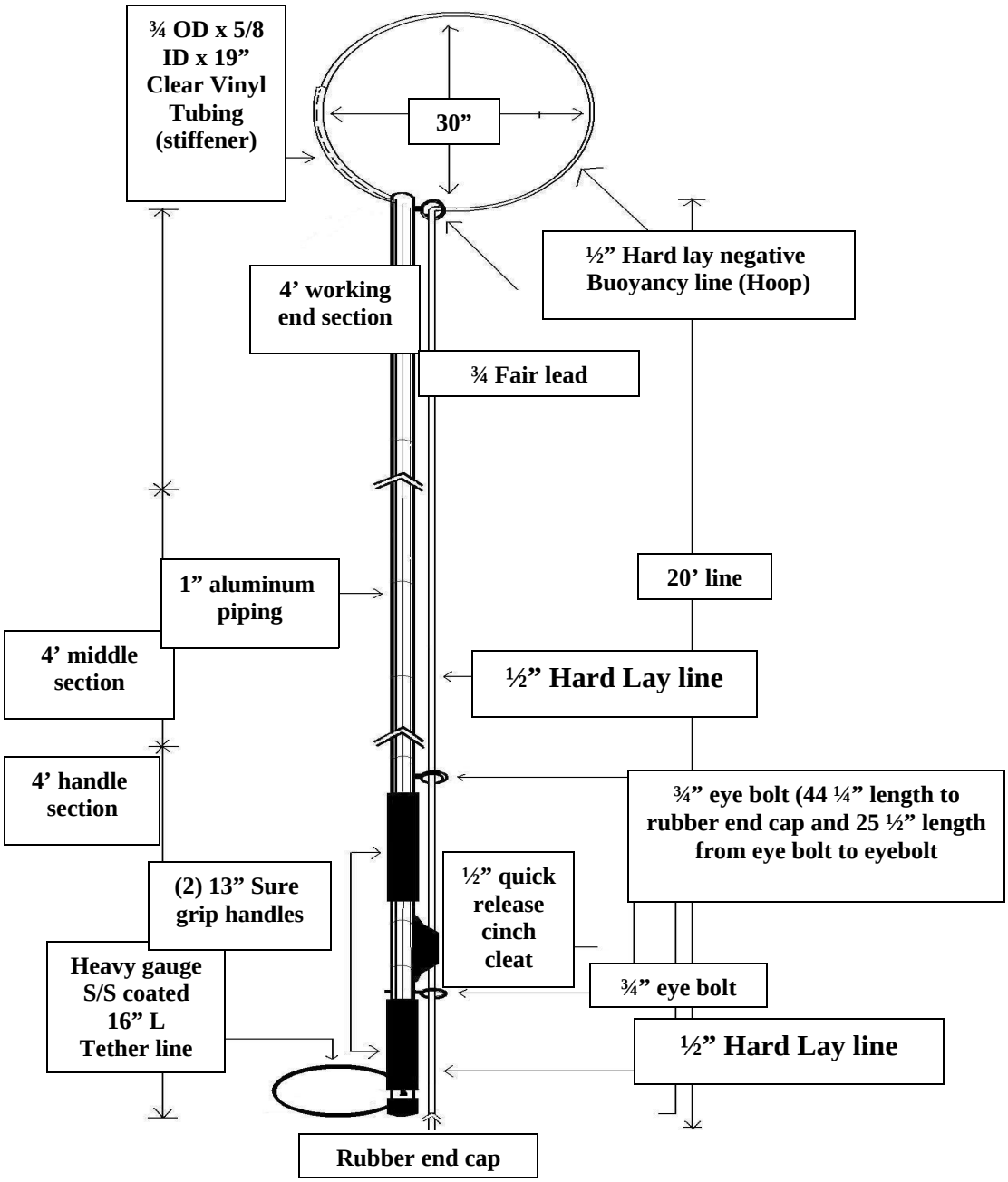
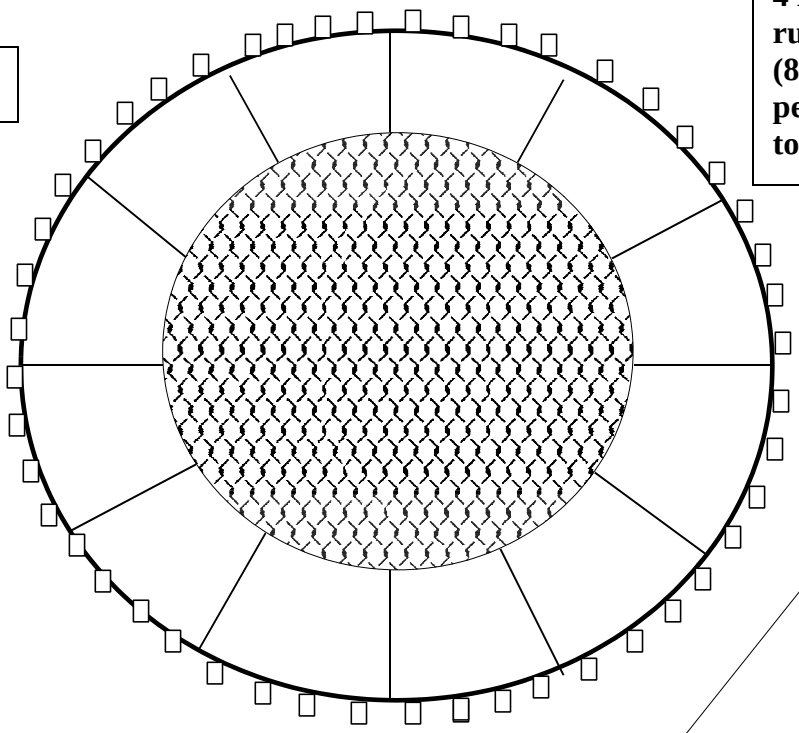


FIGURE 7

LARGE TURTLE HOIST

Top View



4 round rubber cookies (8" x 2 1/2") per section (48 total) on top

3 or 4 point bridle attached with pairlinks and 3/4" nylon 3 strand line.

Top/Fence Ring 7'6" diameter (1 ¾" round 50 series aluminum bar wrapped in 1/2" polypropylene wrap rope)

Fence constructed of 3 mm, 4.7" stretch mesh braided polyethylene webbing

Middle Ring 7'6" diameter (1¾" round 50 series aluminum bar) wrapped in ½" polysteel rope around circumference.

8 mm, 6.5" stretch knotless 600 ply poly-ethylene netting (such as Ultracross netting by Net

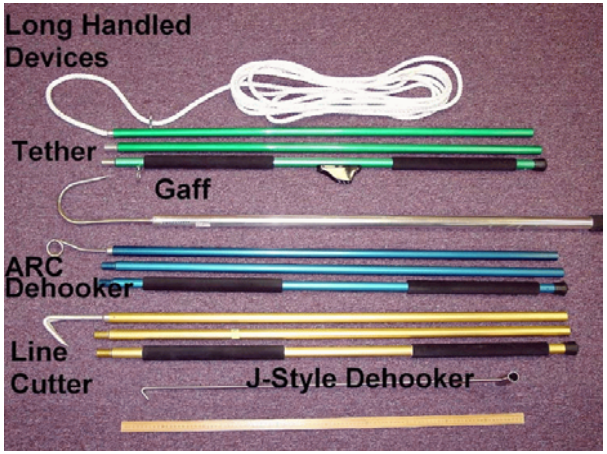
≥18"

(12) beveled spokes ~23" (1" round 50 series aluminum bar or 6061 T6 Schedule 40 pipe) set at ~ 25°. Welded using appropriate welding wire (5052, 6061 or 3003).

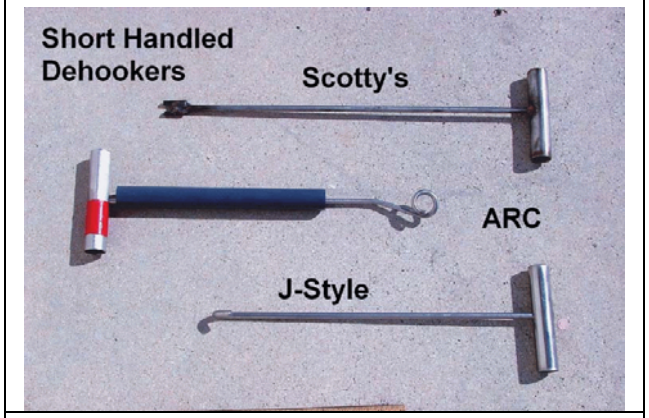
Bottom Ring 4' Diameter (1 ½" round 50 series aluminum bar)

Drawn by L. Stokes

A



B



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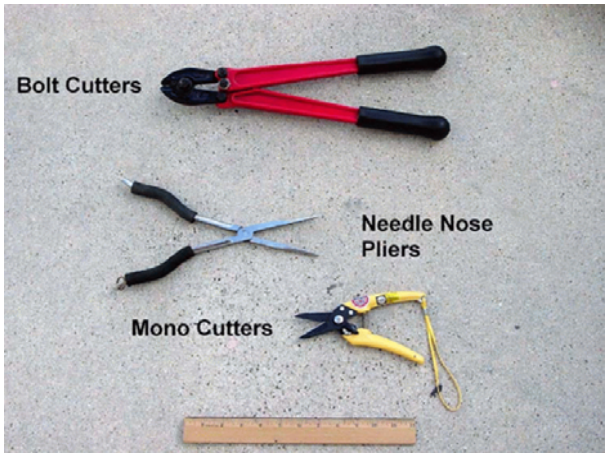

D

E

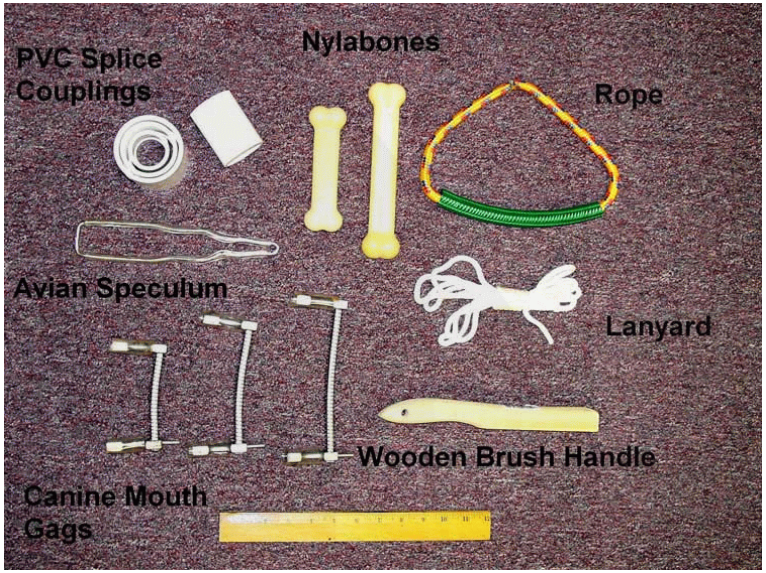

Figure 8

		REQUIRED FOR TURTLES NOT BOATED			
Equipment	***Design Standards***	***Example Model***	***Example Source***	***Requirement***	***Estimated Retail Cost***
(A) Long-handled line cutter	Section (A)(1)	*NOAA/Laforce Line Cutter ARC Model NL12* ***or*** *NOAA/Arceneaux Line Clipper*	Local machine shop **or** Aquatic Release Conservation (ARC) P.O. Box 730248 Ormond Beach, FL 32173-0248 (877) 411-4272 www.dehooker4arc.com Seat Belt cutters: goldenhourmed.com **or** allmed.net	1 required for turtles not boated 1 set of replacement blades also required	*$160-250 (NL12 Laforce 6'-12' breakdown model)* *$140 (4' working end)* *$90 (6" insert)* *$15 replacement blades* *~$3-$10 (6'-12' wooden poles)* *~$40 (8' aluminum pole)* *~$5 seat belt cutter*
(B) Long-handled dehooker for internal hooks	*Section (B)(1)*	*12' ARC Pole Dehooker Model BP11* ***or*** *ARC Model BPIN 9" long 5/16" pigtail insert and suitable handle*	Aquatic Release Conservation (877) 411-4272	1 required for turtles not boated	$120-210 (6'-12' breakdown model) $100 (4' working end) $40 (9" long insert) ~$3-$10 (6'-12' wooden poles) ~$40 (8' aluminum pole)
(C) Long-handled dehooker for external hooks	Section (C)(1)	*12" ARC Pole Dehooker Model BP11* ***or*** *ARC J-Style Dehooker Model LJ6P (6')* ***or*** *ARC 6' Pole Big Game Dehooker Model P610*	local machine shop (J-style dehooker) **or** Aquatic Release Conservation (877) 411-4272	1 required for turtles not boated	$100 (6') $30 (3')
(D) Long-handled device to pull "Inverted V"	Section (A)(1)	*West Marine #F6H5 Gaff hook and #F6-006 handle* ***or*** *Davis Telescoping Boat Hook to 96" Model 85002A* ***or*** *ARC J-Style Dehooker Model LJ6P*	West Marine (800) 262-8464 **or** www.boatersworld.com (877) 690-0004 **or** local machine shop	1 required for turtles not boated	$50-$200

		REQUIRED FOR TURTLES NOT BOATED (continued)			
Equipment	***Design Standards***	***Example Model***	***Example Source***	***Requirement***	***Estimated Retail Cost***
(E) Dip Net	Section (E)(1)	*ARC 12' Breakdown Lightweight Dip Net Model DN6P (6'), DN08 (8')* ***or*** *DN14 (12')* ***or*** *Net Assembly (hoop, net, coupling) DNIN and suitable handle* ***or*** *Lindgren-Pitman Model NMFS-Turtle Net* collapsible hoop net	local machine shop **or** Aquatic Release Conservation (877) 411-4272 **or** Lindgren-Pitman, Inc. (954) 943-4243 Hillman Seafood/net shop Ms Mary 281 339-2897	1 required for turtles boated	~225.00 ` $200.00 $175.00
(F) Standard Automobile Tire	Section (F)(1)		local tire store	1 required for turtles boated	~$20
(G) Short-handled dehooker for internal hooks	Section (G)(1)	*16" ARC Hand Held (sleeved) Bite Block Deep Hooked Turtle Dehooker Model ST08* The hook out system	Aquatic Release Conservation (877) 411-4272 Bass Pro Shops	1 required for turtles boated	$58 $49 - $65
(H) Short-handled dehooker for external hooks	Section (H)(1)	*Hand held large J-Style Dehooker [e.g., ARC Model LJ07 (16")* ***or*** *LJ24 (24')]* ***or*** *Scotty's Dehooker [e.g., ARC Model SC16 (16") or SC24 (24")]*	Aquatic Release Conservation (877) 411-4272 **or** local machine shop	1 required for turtles boated	$14-$20 (ARC 16") $22-$28 (ARC 24")
(I) Long-nose/needle-nose pliers	Section (I)(1)	*12" S.S. NuMark Model #030 281 109 871* 16" neddle nose pliers	Boat's USA (800) 937-2628 **or** JD's Big Game Tackle © (800) 660-5030 **or** local boat supply **or** hardware store harbor frieght	1 required for turtles boated	$20 $ 18.00

$275 (ARC 12' breakdown) $225 (ARC 8' breakdown) $210 (ARC 6' breakdown) $160 (ARC Net assembly) ~

		REQUIRED FOR TURTLES BOATED (continued)			
Equipment	***Design Standards***	***Example Model***	***Example Source***	***Requirement***	***Estimated Retail Cost***
(J) Bolt cutter	Section (J)(1)	*Manufacturer H.K. Porter 1490 AC*	Grainger (888) 361-8649 www.grainger.com **or** Ben Meadows www.benmeadows.com (800) 356-0783 **or** Lab Safety Supply www.LSS.com (800) 356-0783	1 required for turtles boated	$50
Monofilament Cutter (K)	Section (K)(1)	*Jinkai model MC-T*	Tackle Direct (888) 354-7335 **or** www.captharry.com (800) 327-4088 **or** local boat supply store	1 required for turtles boated	$21
(L) Mouth openers/mouth gags	Section (L)	**Minimum of 2 different categories (#1-7) of mouth openers/gags from the list below (all items in category required):**			
(1) Block of hard wood	Section (L)(1)	*Wire brush wooden shoe handle e.g., Olympia Tools Long Handled Wire Brush and Scraper #974174*	Home Depot www.homedepot.com (800) 553-3199 **or** Lowes www.lowes.com (800) 445-6937 **or** local hardware store	Minimum of 2 different categories (# 1-7)	$2.50
(2) Set of (3) canine mouth gags	Section (L)(3)	*Jorvet #4160 (small), #4162 (medium), and #4164 (large)*	Webster Vet Supply (800) 225-7911 **or** www.cotrancorp.com (800) 345-4449 **or** Jorgensen Laboratories jorvet.com (800) 525-5614	Minimum of 2 different categories (# 1-7)	$12.60 each = $37.80/set

		REQUIRED FOR TURTLES BOATED (continued)			
Equipment	***Design Standards***	***Example Model***	***Example Source***	***Requirement***	***Estimated Retail Cost***
		Minimum of 2 different categories (#1-7) of mouth openers/gags from the list below (all items in category required):			
(3) Set of (2) sturdy dog chew bones	Section (L)(3)	*Nylabone™* *Gumabone™* *Galileobone™*	Pet Supermarket (954) 351-0834 **or** www.petsmart.com (888) 839-9638 **or** local pet supply store	Minimum of 2 different categories (# 1-7)	$3.70-$5.00 each= $8.70/set
(4) Set of (2) rope loops covered with hose	Section (L)(4)		Home Depot www.homedepot.com (800) 553-3199 **or** Lowes www.lowes.com (800) 445-6937 **or** local hardware store	Minimum of 2 different categories (# 1-7)	$0.50
(5) Hank of rope	Section (L)(5)	*6' lanyard ~ 3/16" braided nylon rope*	Home Depot www.homedepot.com (800) 553-3199 **or** Lowes www.lowes.com (800) 445-6937 **or** local hardware store	Minimum of 2 different categories (# 1-7)	$0.75
(6) Set of (4) PVC splice couplings	Section (L)(6)		Home Depot www.homedepot.com (800) 553-3199 **or** Lowes www.lowes.com (800) 445-6937 **or** local hardware store	Minimum of 2 different categories (# 1-7)	$0.25-$0.60 each = $1.50/set

		REQUIRED FOR TURTLES BOATED (continued)			
Equipment	***Design Standards***	***Example Model***	***Example Source***	***Requirement***	***Estimated Retail Cost***
(7) Large avian oral speculum	Section (L)(7)	*Webster Vet Supply #85408* ***or*** *Veterinary Specialty Products # 216-08* ***or*** *Jorvet Model J-51z*	Webster Vet Supply (800) 225-7911 **or** Veterinary Specialty Products Vet-products.com (800) 362-8138 **or** jorvet.com	Minimum of 2 different categories (# 1-7)	$0.50 vinyl tubing $15 avian speculum
		RECOMMENDED, BUT NOT REQUIRED, FOR TURTLES			
(M) Turtle tether	Section (M)(1)	*ARC Turtle Tether Model TT08 (8') or TT12 (12')* Captain Tony Geisman pvc electrical conducted 3/4" 1/2 - 5/8 nylon rope	Aquatic Release Conservation (877) 411-4272 **or** local machine shop local shop	Recommended for turtles not boated	$250 (12' ARC breakdown) $200 (8' ARC breakdown) ~$3-$10 (6'-12' wooden poles) ~$40 (8' aluminum pole) ~$30 negative buoyancy line <$30
***(*N) Large turtle hoist** Small turtle hoist	Section (N)(1)	*Leatherback Hoist* Hardshell turtles	Eagle Eye II Corporation 240 Causeway Lawrence, NY 11559 (516) 239-3085 (516) 239-2287 fax local marine wielding shop	Recommended for turtles too large for smaller dip net	~$5000 (plus potential costs for vessel modifications) ~$3,500
collaspsible hoop net	section (n)(1)	Hardshell turtles	Hillman's Seafood Dickinson, TX Net Shop 281 339 2897 Miss Mary	recommended for smaller turtles	~ $175.00

		ESTIMATED COSTS PER VESSEL			
		Lowest estimate (inserts only and constructed handles, least expensive mouth openers)	**Highest Estimate** [(1) 12' aluminum breakdown pole purchased retail: interchangeable with dip net, line cutter, long dehooker; most expensive mouth opener options]		
Required for turtles not boated		~$115	~$550		
Required for turtles boated		~$366	~$454		
Mouth openers		~$4	~$52.50		
Recommended (excluding the turtle hoist)		~$40	~$200		
Total cost per vessel		**~$525**	**~$1256.50**		*Note: These costs are rough estimates and do not account for equipment that vessels may already have (Dip nets, tires, line and monofilament cutters, etc.) Some items may be constructed to specifications using inexpensive materials and/or local machine shops*