Small Cetacean Entanglement Response Best Practices

Executive Summary

Entanglement in, hooking by, and ingestion of, fishing gear and marine debris is a global problem affecting hundreds of marine species. Small cetaceans (*i.e.*, porpoises, dolphins, and toothed species of whales, excluding sperm whales) can become entangled in active and derelict fishing gear and marine debris (*e.g.*, plastic packing bands, large rubber bands, garbage, etc.), as well as ingest fishing gear and marine debris, causing injury and death. Responding to entangled animals is often difficult or impossible due to the inaccessibility of the animal, inability to relocate the animal, inclement weather, lack of experienced and trained personnel, human safety concerns, and more.

PREVENTION is key to reducing entanglements and should be the first consideration for all those involved in entanglement response. Until the influx of entangling materials and debris into the marine environment is reduced, responders must do their best, within the constraints of human safety and logistical concerns, to disentangle small cetaceans that are injured due to human behavior. This document provides small cetacean entanglement response Best Practices based on currently used methods. Best Practices include preparation and planning for a response, necessary authorization and qualifications, human and animal safety, and risk assessment and mitigation. Although this document includes Best Practices, responders should never stop striving for innovative and new methods and training to increase the safety and success of an entanglement response. These protocols are meant as overall Best Practices and should not limit advances in techniques or animal welfare during responses.

Statement of Inclusivity

The Best Practices principles and guidelines outlined in this document are primarily meant for use by authorized and trained responders and managers, as well as, members of federal and state agencies, NGOs, researchers, industries (fisheries, tour), and others from the on-water and coastal communities that might provide authorized small cetacean entanglement response support under NOAA's MMHSRP. The MMHSRP is committed to building a safe and inclusive environment in which we leverage diversity (including, but not limited to, the representation of all ages, races, national, cultural, religious, and socio-economic backgrounds, genders, gender identities, sexual orientations, and physical and mental abilities) to achieve our mission goals and objectives, and maximize the potential of the U.S. Small Cetacean Entanglement Response Network as a whole for the conservation of small cetaceans. The MMHSRP values the unique capabilities, experiences, and perspectives of all our partners, and nothing should preclude people from becoming involved in the U.S. Small Cetacean Entanglement Response Network to the best of their abilities. Diversity, equity, and inclusion improves creativity, productivity, and the vitality of the marine mammal community in which the MMHSRP engages.

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1 Introduction

1.1. Background

Marine entanglement is defined as an interaction between marine species and human-made material in which the loops and openings of various types of fishing gear and debris entangle animal appendages or entrap animals (Laist 1997). Entanglement of non-targeted species in fishing gear such as traps, rope, and nets is of growing concern for wildlife worldwide and can result in serious injury and mortality (Reeves *et al.* 2003, Dau *et al.* 2009, Anderson *et al.* 2011, Adimey *et al.* 2014).

Fishery gear, most notably monofilament and micro-multifilament lines, trap pot lines, and nets, has been documented as a significant source of entanglements for aquatic animals including sea turtles, marine mammals, and coastal and marine birds (Laist 1997, Adimey *et al.* 2014). Additionally, marine debris, which is any persistent solid material that is manufactured or processed and directly or indirectly disposed of or abandoned into the marine environment, is a significant global stressor on the marine and coastal environment (Coe and Rodgers 1997, UNEP 2009). The majority of marine debris is composed of various forms of plastic that are highly persistent, and chemically harmful either because they are themselves potentially toxic (Lithner *et al.* 2011) or because they absorb other pollutants from the surrounding seawater (Teuten *et al.* 2009, Rochman *et al.* 2013a). The impact of marine debris is of global concern, affecting at least 693 species (Gall and Thompson 2015). More than half of these reports documented entanglement in and ingestion of marine debris, and represented more than a 100% increase since the last review by Laist (1997), which reported 247 species impacted by marine debris.

Increasing concern over plastics in the ocean led to the introduction of Annex V of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) which prohibits the at-sea disposal of plastic wastes. Annex V was signed in 1973, although a complete ban on the disposal of plastics at sea was not enacted until the end of 1988. Despite 134 nations agreeing to eliminate plastic disposal at sea, oceanic sampling indicates that the problem has worsened since MARPOL was signed (Rochman *et al.* 2013b) and formally adopted in 1988. Illegal dumping of plastics, fishing gear, and garbage is difficult to enforce and continues to be a threat to marine life.

Entanglements have been identified as a significant cause of injury or mortality to small cetaceans (*i.e.*, porpoises, dolphins, and toothed species of whales, excluding sperm whales) throughout the world. Entangling materials may cause drowning, lacerations, amputation of appendages, infection, strangulation, increased energy expenditure (especially while dragging large fragments of net or biofouled line), may impact behavior and foraging, and may result in premature death and/or dependent offspring mortality. Common examples of entangling gear that harm small cetaceans include active or derelict fishing gear, rope, and other debris (Wells

et al. 2008, Barco *et al.* 2010, Stolen *et al.* 2013, Adimey *et al.* 2014). Small cetaceans can also ingest fishing line, hooks and lures leading to injury and death (Barros *et al.* 1990, Gorzelany 1998, Baulch and Perry 2014, McLellan *et al.* 2015).

To address the root of the entanglement problem - primarily plastic debris in the ocean or interactions with fisheries - stakeholders, industry, non-governmental organizations, local, state and federal governments, and Native organizations **must work together to solve the problem.** A number of agencies and organizations have developed methods to respond to entangled small cetaceans.

However, entanglement response is limited for many reasons (*e.g.*, inaccessibility of the animal, inability to relocate the animal, inclement weather, lack of experienced and trained personnel, human safety concerns, cost, etc.), with response reaching only a small fraction of entangled animals.

Mitigation of entanglement in active or derelict fishing gear and **prevention** of debris entering our waterways is essential.

1.2. Legislation Pertinent to Small Cetacean Entanglement Response

There are two key pieces of legislation that govern interactions with marine mammals in the United States, the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). In 1992, the United States Marine Mammal Health and Stranding Response Program (MMHSRP), under the National Marine Fisheries Service (NMFS), was established by Congress under Title IV of the MMPA. The MMHSRP coordinates marine mammal stranding response efforts in the United States under Title IV of the MMPA as well as a NMFS MMPA/ESA permit. The MMHSRP works to standardize regional network operations and define national stranding response policy.

MMPA: The MMPA, signed into law in 1972, prohibits the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas, which includes harassing or disturbing these animals, as well as harming or killing, unless such take is specifically exempted in the statute or authorized. The MMPA divides responsibility for marine mammal species between the Secretary of Commerce, who oversees NMFS, and the Secretary of the Interior, who oversees the United States Fish and Wildlife Service (USFWS). NMFS is responsible for the protection and conservation of all cetacean and pinniped species (with the exception of walruses), and their habitat. USFWS oversees the management of walruses, polar bears, sea otters, and manatees, and their habitat. The 1992 amendments to the MMPA, including Title IV, established the MMHSRP under NMFS to collect and disseminate information about the health of marine mammals and health trends of marine mammal populations.

ESA: The ESA, enacted in 1973, provides for the conservation of species listed as endangered (in danger of extinction) or threatened (at risk of becoming endangered in the foreseeable future). The ESA also contains a

prohibition on "take" (with certain exceptions), which means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S.C. § 1531).

1.3. Best Practices Purpose and Intended Uses

NMFS and the MMHSRP have developed Best Practices for responding to live small cetaceans observed with life-threatening entanglements, or more rarely, that have ingested fishing gear, to ensure the health, welfare, and safety of human responders and the impacted animals. These Best Practices balance the need for standardized procedures while allowing flexibility to address specific needs of different situations for diverse species and habitats, as well as unforeseen circumstances. For more information on general stranded marine mammal rescue and rehabilitation, visit the MMHSRP webpage or see *Marine Mammals Ashore* (Geraci and Lounsbury 2005) and the *CRC Handbook of Marine Mammal Medicine* (Gulland *et al.* 2018). Human and animal safety is the top priority for NMFS and the Marine Mammal Stranding and Entanglement Networks (Network). As each event is unique, NMFS and the Network evaluate several different factors (discussed below) before making the decision to intervene.

These Best Practices highlight general protocols and procedures specific to small cetaceans entangled in fishing gear or marine debris. Protocols and procedures for use with pinnipeds or large cetaceans can be found in the NMFS Best Practice Guides for Pinniped or Large Whale Entanglement Response, respectively. These Best Practices are designed to be paired with more specific regional annexes to address any concerns, including species-specific issues (*e.g.*, endangered species response), more appropriately addressed at regional or state levels. These Best Practices include guidance for entanglement response methods for small cetaceans including remote techniques for free-swimming and anchored animals, physical capture and restraint, and future gaps and research needed.

These Best Practices have been developed to serve as guidance and recommendations. This document is not intended for independent use as a training manual, and does not by itself qualify the reader for any actions or authorizations. These Best Practices balance the need for standardized procedures while allowing flexibility to address specific needs of different situations for diverse species and habitats, as well as unforeseen circumstances. In some situations, responders may choose a course of action not outlined in these documents; responders should consult with NMFS, if feasible, if the course of action varies from Best Practices. These Best Practices are a "living document," and as such, we plan to periodically review and update them as new information becomes available. Responders should never stop striving for innovative and new methods and training to increase safety and success, and nothing in these Best Practices should prevent or limit advances in technology, techniques, and training.

1.4. Structure of the Document

This document is organized as follows:

- Section 2: Planning for a small cetacean entanglement response;
- Section 3: Small cetacean entanglement response techniques – remote interventions for free- swimming small cetaceans;
- Section 4: Small cetacean entanglement response techniques – remote interventions for anchored small cetaceans;
- Section 5: Small cetacean entanglement response techniques – physical in-water capture and restraint for free-swimming small cetaceans;
- Section 6: Gaps and future research needs;
- Section 7: Conclusions;
- Section 8: Acknowledgements;
- Section 9: References; and
- Section 10: Appendices.

This document is structured so that each section can be used as a stand-alone Best Practices guide for the appropriate entanglement scenario (remote interventions or physical in-water capture). Each section provides a broad overview of Best Practices for each response type. Section 6 provides information about current gaps in our knowledge and future research needs. The appendices provide additional forms, datasheets, checklists, etc. used during small cetacean entanglement response.

1.5. Funding

The John H. Prescott Marine Mammal Rescue Assistance Grant Program provides funding for eligible Network members and collaborators through an annual competitive grant process (subject to annual appropriation from Congress). These grants support the rescue and rehabilitation of stranded marine mammals (including small cetacean entanglement response), data collection from living or dead stranded marine mammals for health research, and facility operation costs. However, as these grants are competitive and there is insufficient funding to cover all costs of the Network, individual Network members must also support many of the costs for normal operations. Determining whether funding is available for an intervention is an important first consideration, as lack of funds or available in-kind donations (*e.g.*, boat use) may limit available options for certain responses.

2 Planning for Small Cetacean Entanglement Response

2.1. Authorization

Small cetacean entanglement responses are conducted under MMPA authorization either under a 112(c) agreement issued by NMFS to Network members through a Stranding Agreement (SA), under 109(h) authority exercised by local, state, federal or tribal entities, or under a NMFS MMPA/ESA research permit. Responses that involve unintentional harassment of non-target marine mammals (*e.g.*, capture of mom with calf when only one of the pair is entangled) must be covered under the NMFS MMPA/ESA research permit. Only responders who have been authorized by NMFS and who have the appropriate training, experience, equipment, and support should attempt small cetacean entanglement response. Response efforts may also rely on state and federal agencies (including law enforcement agencies and the United States Coast Guard, USCG), non-governmental organizations, fishermen, and other groups for assistance.

Under the authorization of a MMHSRP MMPA/ESA research and enhancement permit, experienced responders are allowed to disentangle all small cetacean species, including species listed as endangered or threatened under the ESA. NMFS Office of Protected Resources (OPR), including the appropriate Regional Stranding Coordinator (RSC), must be consulted for approval prior to conducting *any* small cetacean entanglement response activities. Additionally, the permit covers the unintentional harassment of other non-target marine mammals during the response attempt (*e.g.*, the calf of an entangled female). All procedures requiring sedation, anesthesia, surgery, or euthanasia must be performed under the direct or indirect supervision of a veterinarian. Entanglement response should only be attempted if the entanglement is deemed to be causing, or has the potential to cause, a life-threatening injury (see pp 34-35 NMFS Serious Injury Procedure for details).

Responders must be trained in proper techniques for safe capture, restraint, and removal of gear from various marine mammal species. Opportunities for apprenticeships or assistant roles to gain the necessary hands-on expertise can be arranged via the appropriate RSC. Specific training issues or requirements may exist for certain activities (*e.g.*, in-water captures) and are more appropriate to address at regional or state levels by working with the RSC.

2.2. Preparation

Prior to any operation: entanglement response requires extensive logistical preparations, including training of personnel, developing strategies for successful intervention, and identification of appropriate supplies/equipment/vessel support. Once approval from NMFS has been received and prior to any operation, an experienced team should be selected and roles and boat crews assigned. An Incident Command System (ICS) Incident Action Plan (IAP) type document or similar planning document and safety protocols are recommended to be distributed to the team for review.

Contingencies for rehabilitation should be identified in case it is determined that the injury is too severe to warrant immediate release on-site. Contingencies for euthanasia should be identified in case it is determined to be the best course of action. All equipment (*e.g.*, medical, communication, response, vessels, vehicles, tags, animal transport gear, etc.), should be cleaned, organized, packed, and ready for operations on short notice. Tide and currents, as well as navigational charts should be reviewed to decide the best tide window and potential locations for an appropriate, safe response.

24 – 72 hours prior to operation:

- Check marine weather forecasts.
- Ensure that the animal has been sighted recently (*i.e.*, within 5 days of scheduled disentanglement effort), to confirm that the entanglement is still active (*e.g.*, gear has not moved or fallen off, etc.) and the animal is still alive/in the area.
- Notify appropriate entities (*e.g.*, NMFS RSC, law enforcement, harbormaster, park personnel, lifeguards, etc.). Depending on drugs present and remote area operations, notifying local EMS and/or USCG can expedite response and treatment in case of human accidental exposure.
- Ensure appropriate authorization (*i.e.*, NMFS approval, and other approval if response on park, preserve, private land).
- For human safety, if conducting in-water net activities, personnel trained in emergency medical services (EMS) should be part of the on-water team.
- Keep rehabilitation facilities informed of plans and schedules.
- Develop rehabilitation contingency and necropsy contingency plans.

Immediately prior to operation:

- Conduct safety and operations briefing.
- Re-check marine weather forecasts.
- Consult decision matrix (Appendices F and G) – prior to operations and during operations, determine if conditions allow for safe operations and make a final go/no go decision for response.

2.3. Training

Depending on response type, responders must be trained in either remote entanglement response techniques, and/or safe capture, handling, monitoring under restraint, and in-hand entanglement response techniques. Training requires hands-on experience under the direct supervision of experienced response personnel. If possible, inexperienced personnel should watch the process and participate in low-level aspects of the response to gain more experience. Personnel should document their training and skills so the RSC and response coordinator, who are choosing the team, have a current list of team abilities, if requested. Although there are currently no formal national training programs in place, the MMHSRP or RSC can direct personnel toward resources relevant to the species of interest, whenever available and NMFS is working to develop a training

tracking system for future use.

2.4. Human and Animal Safety

Because of the inherent risks encountered during an entanglement response, methods used to remotely disentangle, and to capture and restrain an animal, should minimize risk, stress, and pain to the animal while also ensuring the safety of both the animal and responders (Norman *et al*. 2004). A broad list of human and animal safety procedures can be found below. More detailed lists can be found in each specific entanglement response section (*e.g.*, Sections 3-5)

1.9.1. Human safety

- Create a written safety protocol with emergency services response numbers to be kept with first aid kits.
- Responders should only conduct procedures for which they meet minimum qualifications and training.
- Personnel should wear appropriate personal protective equipment (PPE) such as strong, non- slip, closed-toed footwear without potentially entangling external features (*e.g*., hard-soled dive boots), PFDs, wetsuits (when temperatures require them), helmet and gloves (if appropriate), and appropriate clothing as necessary for weather conditions.
- Designated personnel (*e.g.,* hit boat teams) should carry safety knife/cutter on their person for human and animal safety.
- Vessels should have appropriate human safety equipment (*e.g.*, a throw bag, safety ring, etc.) available in case of person overboard.
- Ensure first aid kits are with each response group/vessel.
- Use a hooked/curved/covered blade for cutting (*e.g.*, net, line, debris, etc.) to minimize accidental injury to handlers and the animal and cut away from yourself. Stow the cutting implement safely when finished.
- Do not wrap net or line around hands or fingers, remove entanglement hazards (*e.g.*, earrings, rings, watches), and keep feet clear of lines and nets.
- All anticipated drugs that may be used should be recorded on an emergency response sheet in case of accidental exposure; this allows EMS to quickly evaluate human exposure. Notifying local EMS of drugs on-hand and the dates and locations of operations in advance of a planned entanglement response can expedite response and treatment in case of human accidental exposure. If drugs will be used, responders should be familiar with drugs and reversals, including symptoms of accidental exposure and if/when/how to treat prior to the arrival of medical personnel.

- Assign buddies to watch over one another.

1.9.2. Animal safety

- Use a decision matrix (see Section 2.12) prior to capture to ensure risks are anticipated and accounted for by all responders and properly mitigated.
- Consider potential effects of response efforts on non-entangled animals and/or species within the response areas and take precautions to minimize disturbance.
- For remote disentanglement, responders should minimize close approaches and take breaks between disentanglement attempts if the animal shows signs of distress or tiring. The number of disentanglement attempts per day and number of consecutive days should be evaluated on a case-by-case basis, taking into account the severity of the animal's injury and the individual animal's response to disentanglement attempts.
- All procedures requiring sedation, anesthesia, surgery, or euthanasia must be performed under the direct or indirect supervision of a veterinarian.
- A veterinarian or veterinary technician should be present if conducting in-water capture activities under the permit.
- Responders should reduce the unavoidable stress that comes with animal capture by minimizing the duration of restraint and/or captivity, remaining calm and quiet around the animal and limiting manipulation and transport of the animal.
- Have one team member constantly monitoring the animal's condition including vitals and behavior.
- Responders should only use appropriate, species-specific handling methods with trained personnel to make the capture response as efficient as possible and to minimize negative effects.
- When the animal is in hand, ensure it is secured appropriately so that the blowhole is clear and it is still able to breathe comfortably, and the eyes are not covered or abraded.
- For captured animals, it is important to prevent potential thermoregulatory stress by managing temperature control through consideration of the effects of wind, sun, water and air temperature, and shade. In warm conditions, you can often keep animals cool by pouring water over the dorsal fin and flukes if the animal is out of water, providing shade if possible, and minimizing handling time. If the animal becomes too cold out of the water, emergency blankets can be used.
- When embedded, peel the entangling material out of the wound rather than dragging it or pulling it out from one side when feasible; this can minimize pain and prevent further injury.
- Once done, clean and sterilize any disentangling or sampling tools that were exposed to the animal.

2.5. Incident Command System

The ICS as it applies to an entanglement response is a standardized approach to establish common processes for planning and managing the response. It enables a coordinated effort among all responders, and allows for the integration of equipment, personnel, procedures, and communications among responders. ICS is based on decades of lessons learned, the achievement of response objectives, the efficient use of resources, and helps ensure the safety of responders and the animals. ICS uses standard terminology and common terms to ensure understanding among all responders. ICS establishes a clear chain of command, transfer of command, ensures integrated communications, professionalism, accountability, and organizational structure.

The Incident Commander (IC) is responsible for the overall operation, including the performance of the response, and while usually found onsite with the response team, may not generally participate directly in the operation. This enables the IC to remain focused on the larger picture of the response. In some small cetacean responses, the IC may be combined with the Capture Lead (see sections 2.6, 3.4, 4.4 and 5.4 for more details on team roles). By using ICS, each team member knows their exact role in the response, the response plan, and any mitigation measures should there be an emergency during the response. An IAP type document outlines incident goals and objectives, disseminates information about the response, and is revised on a regular basis to maintain consistent, up-to-date guidance. More information about ICS and how to take a free course can be found at: https://training.fema.gov/is/courseoverview.aspx?code=IS-100.c

2.6. Team Member Roles

Responding to entangled small cetaceans either remotely or in-water has inherent risks for both responders and animals. Clarifying team member roles and responsibilities prior to any response, and ensuring that responders meet minimum qualifications for each role, is essential to a safe and successful response. Disentangling small cetaceans should always be conducted by trained personnel. When medications are used for treatment or sedation, extra training and licensing requirements are required, and safety protocols must be in place.

Detailed descriptions of team member roles and responsibilities are described in detail within each of the entanglement response method sections (see 3.4, 4.4 and 5.4). All personnel should be familiar with the MMHSRP MMPA/ESA permit and the minimum qualifications and criteria for each role if the response is conducted under the permit. In general, roles and responsibilities might include but are not limited to:

1) Incident Commander (IC);
2) Capture Lead (CL);
3) Human Safety Officer (HSO);
4) Small Boat Operator(s);
5) Disentanglement Tool Operator;

6) Net Boat Driver (*i.e.*, Catcher) (if in-water net used);
7) Net Lead (if in-water net used);
8) Licensed Doctor of Veterinary Medicine (DVM) or equivalent or Veterinary Technician;
9) Animal Handlers;
10) Data Collector;
11) Photographer and/or Videographer (still and video photography);
12) Crowd/Security control (this could be performed by law enforcement, park personnel, volunteers, etc.);
13) Communications/Public Information Officer;
14) Unmanned Aerial System Operator.

2.7. Communication

Clear communication is essential before, during, and after an entanglement response. There must be clear communication when planning for the response, and among team members during the response (*e.g.*, among vessel operators, between vessel operators and shore personnel, between response team and emergency personnel, members of the public, law enforcement, harbor masters, etc.). Common forms of communication include very high frequency (VHF) handheld or mounted marine radios, satellite phones, cell phones, and two-way radios (*e.g.*, walkie-talkies). Some applications for phones (*e.g.*, Zello) allow a cell phone to be used as a walkie-talkie. Non-verbal communication may also be required while approaching an animal. Responders should ensure all non-verbal communication gestures are understood by the entire response team and practiced prior to each response.

The IC and CL must coordinate with the MMHSRP, RSC, and Regional NMFS Communications staff concerning media contacts relating to high-profile entanglement response events, as necessary. Responses are generally not advertised and most media interviews or social meeting postings are conducted after the response has taken place. If responders are contacted by the media for an interview, they should notify the Regional NMFS Communications Specialist before responding. If a Communications Specialist cannot be contacted prior to a response to the media, the responders should coordinate with the RSC and provide an email summary of the interview (including name and contact information of the reporter, and media outlet). It is best to work with communications staff for news media, such as news releases, news conferences, media interviews *as well as social media posts*. All media interviews should be considered "on the record". Always remember that human safety comes first, followed by the entanglement response. **Responders are NOT required to speak to the news media.** Examples of frequently asked questions regarding small cetacean entanglement response can be found in Appendix A.

2.8. Environmental Conditions

Responders should consider weather, environmental conditions, and features of the response area prior to any entanglement response effort. These considerations should include wind, precipitation, fog, sea state, incoming storm systems or any other changes in weather, tides, currents including subsurface currents, submerged hazards (*e.g.*, crab pots, derelict gear, oyster beds, etc.), and surf. The air and water temperatures should also be considered. If it is too hot, the responders or animals could become overheated; if too cold, it could be a safety risk for responders and the animal.

2.9. Equipment

Each type of response (remote techniques, physical capture and restraint in-water) requires specific equipment. Small boats generally fall within the range of 16-26 feet in length and operate in near- shore environments, although the size and type of vessels may vary depending upon the response needs. It is essential that the proper equipment be clean, tested, packed, and immediately available before a response. Typical equipment required for all responses includes data sheets, camera, disentanglement tools, etc. Physical capture and restraint in water also includes capture and restraint equipment (e.g., nets, floating mats), tags, and medication administration equipment (e.g., antibiotics and sedation). Specific equipment is outlined in individual sections later in this document (see Sections 3.6, 4.6 and 5.6).

Table 2-1. Overview of general equipment that may be used for remote techniques and physical capture and restraint in-water methods.

General Equipment	Remote techniques – free-swimming	Remote techniques – anchored	Physical capture restraint in-water
Communications (*e.g.*, marine radio, cell phone, satellite phone)	X	X	X
Data supplies (*e.g.,* clipboard, data sheets) and recording equipment [*e.g.,* camera (with backup), video, dorsal fin board]	X	X	X
Safety equipment/Protective clothing and shoes/PFDs	X	X	X
Medical equipment for humans and animals (*e.g.,* human first aid, dolphin 'crash' kit, stingray kit)	X	X	X
Small boats/vessels	X	X	X
Disentangling equipment/tools	X	X	X
Capture/Restraint equipment (*e.g.*, nets-hoop, seine, floating mats, stretchers)		X	X

General Equipment	Remote techniques – free-swimming	Remote techniques – anchored	Physical capture restraint in-water
Sampling, Marking, Tagging [*e.g.,* blood collection, processing, storage supplies, freeze- branding system, and tagging equipment *(e.g.,* roto tag or satellite-linked)]		X	X
Medication administration equipment (*i.e.,* antibiotics, sedation)		X	X
Cleaning/disinfectant supplies	X	X	X

2.10. Data Collection

Response and sampling data needs must be well thought out prior to the start of any entanglement response effort. Instructions should be followed and data forms completed during a response. Capture and sampling equipment checklists should be developed and used. Important data forms for preparation prior to response may include: applicable permits, Level A and Human Interaction Forms (Appendix B – Level A and Human Interaction Form), gear checklists (*e.g.*, Appendix C - Gear Checklist), disentanglement forms (*e.g.*, Appendix D – Disentanglement form), respiration rate form (*e.g.,* Appendix E - Respiration rate form), priority sample sheet (will vary with each response). All entangling gear should be photographed prior to removal and retained after removal (if possible), documented on the Level A and Human Interaction Form, and stored in a centralized location or sent to a gear repository, please consult with the RSC on appropriate repositories by region.

2.11. Risks and Mitigation

To minimize risks to human responders, animals, and, in some cases, the general public, a comprehensive entanglement response safety plan should be implemented. A safety briefing should occur prior to each entanglement response. In addition, a decision matrix or Go/No Go criteria (Appendices F and G) should be established to guide responders in making safe decisions regarding the response to entangled small cetaceans. Responders should prepare, plan, and practice for possible risks and identify mitigation measures (Table 2-2) for these risks prior to any response. After each response, the team should conduct a thorough de-brief and summarize lessons learned that can be applied to future responses. When responding to entangled small cetaceans, the list of risks and mitigations is never complete. ***There is always room for improvement and documents should be updated continually.***

Table 2-2. A general risk and mitigation checklist to use for an entanglement response.

General Risk and Mitigation Checklist	√
Approval for response from NMFS	
Approval for response from NMFS permit holder (if applicable, *e.g.*, ESA species, unintentional harassment)	
Assign an Incident Commander, Capture Lead, and Human Safety Officer	
Arrange for a NMFS-approved dolphin Catcher, if necessary	
Veterinary support (if in-water net capture or medications administered)	
Make arrangements for possible transfer to rehabilitation facility	
Alert law enforcement (and harbormaster, land owners etc., if applicable)	
Depending upon response type, have EMS contact information readily available or have EMS personnel (can serve as Human Safety Officer) as part of the team if conducting in-water net capture activities	
File a float plan with designated Point of Contact	
Check vessel, trailer, vehicle, and equipment operation	
Prepare for follow-up monitoring (*e.g.,* obtain and program tags)	
Assign and explain team member roles	
Review authorization/permit and decision matrix or Go/No Go	

Check marine weather forecasts and tides	
Review safety plans	

Risk Management Assessment

Assessment of risks and mitigation starts long before initiating a response. Risks to humans and animals should be identified, and mitigation measures established. Specific risk and mitigation measures will be listed under individual sections later in the document (see Sections 3.8, 4.8 and 5.8). Some examples of general risk and mitigation measures are listed below.

RISKS TO HUMANS

Risks:

- Injury or death as a result of drowning; slips, trips, or falls; propeller wounds when working around vessels, dolphin, and net; human entanglement in net (such as hands, fingers, arms resulting in breaks and amputations); trauma associated with animal restraint (*e.g.,* bites, scratches, bruises, breaks); changeable environmental conditions; injuries from other marine organisms (*e.g.,* stingrays, oysters, sharks).
- Accidental injection, ingestion, spray, or absorption of drugs during capture, or ingestion of drugs as a result of future subsistence use.
- Exposure to pollutants, biotoxins, etc.

***Mitigation*:**

- Preparation, planning, practice, proper training, and use of decision matrices.
- Licensed Doctor of Veterinary Medicine (DVM) or equivalent, or Veterinary Technician present if sedation drugs will be used during the response.
- IC, CL, and HSO to oversee operations.
- Wear appropriate PPE.
- Use luer lock syringes with hand injectable drugs (to reduce likelihood of spray back).
- If working in Alaska, native communities should be notified prior to any captures using medications or sedatives, and animals that have been given drugs should be well marked and the markings communicated to the native communities so they can identify the animal prior to possible subsistence use.

RISKS TO ANIMALS

Risks:

- Injury or death to an entangled animal from remote disentanglement tools, net, drowning, or other animals.

- Injury to surrounding non-entangled animals from unintentional capture during net operations or from vessel operations during response.
- Possible separation of social unit (*e.g.,* mom and calf).

***Mitigation*:**

- Preparation, planning, practice, and use of decision matrices.
- Captures only performed by highly trained and a sufficient number of personnel.
- Having a veterinarian or veterinary technician present during in-water capture operations under the permit.
- Adequate survey of capture area to ensure minimal risk to any nearby non-entangled animals.
- Adequate amount of appropriate reversal agents to be administered by licensed DVM or equivalent, or veterinary technician, if sedation drugs will be used during the response.
- Animal emergency medications available (*e.g.,* doxapram, epinephrine, steroids, etc.)

2.12. Intervention Criteria/Decision Matrix

The first and most important question that will be asked by NMFS prior to authorizing an entanglement response is: **Is the entanglement life threatening?** Entanglement response should only be attempted if the entanglement is deemed to be causing, or has the potential to cause, a life-threatening injury, and that the potential risks of capture are necessary for the survival of the animal, due to the serious nature of the entanglement (*e.g.*, see pp 34-35 NMFS Serious Injury Procedure for details).

For entangled small cetaceans, NMFS, in consultation with experts and veterinarians, will determine if an entanglement is considered life threatening. This is achieved through field observations by biologists, researchers, and veterinarians, analysis of photos and/or videos, the animal's behavior and appearance, and prior experience with similar entanglements (*e.g.,* Wells *et al.* 2013). Table 2-3 outlines some of the evidence, levels of severity, and response methods that may be considered when assessing interventions.

If the entanglement is determined to be life threatening, the next step is to determine the most appropriate method of intervention. If intervention is not an option or the entanglement is not considered life threatening, the animal may be monitored, usually by local researchers, stranding network partners, or trained biologists, to determine whether an intervention may be possible at a later date (*e.g.*, the animal moves to a more suitable area for rescue, the animal live strands, the animal becomes lethargic and more approachable, weather improves, the animal's condition deteriorates (if the entanglement was not originally considered life threatening).

Table 2-3 Small Cetacean Entanglement Intervention (Evidence, Levels of Severity, and Methods)

Evidence	Visible entangling material present; encircling lesions with likelihood of embedded gear around/through mouth, body, dorsal fin, flippers, flukes; animal anchored by gear. May also include lesions and abrasions from contact with trailing gear. Entangling material may include fishing gear (*e.g.*, monofilament, net, rope) and marine debris.
Level of Severity	**Conditions**
Serious Outcome (Life threatening)	Entanglement gear interfering with breathing and/or feeding; circumferential wraps around or gear embedded in head, mouth, flippers, peduncle, body; gear severely limiting mobility or animal is anchored; hooks in eyes or head; ingested fishing gear protruding from the mouth (https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-policies-guidance-and-regulations#distinguishing-serious-from-non-serious-injury-of-marine-mammals)
Unlikely Serious Outcome	No restrictions of breathing and/or eating; fishing gear not embedded; gear only impacting the dorsal fin; minor superficial lesions; strength of animal exceeds that of the gear (Moore *et al.* 2013); hooks externally except for eyes or head; line only affecting distal portions of dorsal fin or flukes (Wells *et al.* 2008)
Intervention Method	Remote disentanglement; in-water capture for free swimming animals
Disposition Options	Released at site; translocated and released; rehabilitation; euthanasia

Additionally, if the decision to intervene is made, then there are two main tools to aid in determining if a response should occur: 1) The Risk Factor Model, and 2) The Go/No Go decision matrix:

1) **The Risk Factor or GAR (Green-Amber-Red) Model** (Table 2-4). The GAR model allows for time critical risk assessment and generates communication concerning the response risks. This communication then helps identify the risk and leads to the appropriate mitigation. This model is not a strict Go/No Go because it is focused on identifying risks and mitigations. If the cumulative risk levels across multiple areas (*e.g.*, team composition, mission complexity, etc.) are above a certain threshold, teams must work with the IC, CL, RSC, and/or contact the permit principal investigator (*i.e.*, the MMHSRP) if acting under the permit, prior to conducting activities to discuss mitigation measures or the team must stand down.

Table 2-4. The GAR (Green-Amber-Red) General Model Table based on a table provided by The Hawaiian monk seal research program, NMFS, also see Appendix F.

Risk Factor	Risk Factor Category						Risk Level
	Very Low - 1	Low - 2	Medium - 3	Medium High - 4	High - 5	Very High - 6	
Environment	Very Acceptable	Acceptable	Moderately Acceptable	Moderately Dangerous	Dangerous	Very Dangerous	
Team Composition and Fitness	Excellent Team	Good Team	Appropriate Team	Marginal Team	Poor Team	Very Poor Team	
Animal Condition	Healthy (besides entanglement)	Healthy (besides entanglement)	Mildly Compromised Health	Moderately Compromised Health	Highly Compromised Health	Highly Compromised Health	
Permits & Authorization	Excellent		Good		Poor		
Resources: Equipment, PPE, Communication, etc.	Excellent		Good		Not Prepared		
Mission Complexity: New or Experimental, Time Sensitive, etc.	Simple	Standard	Moderately Complex		Very Complex	Extremely Complex	
If any risk level equals:	Medium-High	Discuss with capture lead or immediate supervisor before proceeding.					
	High – Very High	Contact NMFS					

Key considerations or questions to be asked in the risk factor analyses (GAR):

- ***Health and behavior assessment:*** Ideally, previous observations via photos or video will have allowed for an initial assessment of health prior to the response, including evidence of malnutrition/emaciation, active infection or abscesses, etc. During the response, observe current body condition, responsiveness (responds normally to natural stimuli), or if there are any external or behavioral abnormalities including abnormal breathing patterns.
- ***Weather and tide concerns:*** Does weather pose a threat to the animal or responders (*i.e.*, heat stress, hypothermia, large waves, or threatening storms)? If so, is there a way to mitigate it? Consider the animal's body temperature before, during, and after handling. Is the tide coming in or going out, how high/low is it and how can it impact the event?
- ***Habitat concerns:*** Habitat (*i.e.*, geographic location, substrate type, navigational hazards, water

depth, currents) should be assessed for hazards to animals and responders.

- ***Equipment:*** Is all necessary gear functional, available, and ready? This includes, but is not limited to: vessels, capture net, tagging, sampling, instrumentation, disentanglement tools, emergency equipment, temperature mitigation gear (*e.g.*, shade, bucket and sponges for water), and transport gear (*e.g.*, truck, vessel, foam mats).
- ***Presence of other animals of concern:*** Are there other small cetaceans, or other wildlife in the area that may be disturbed by the response (*e.g.,* manatees inhabiting the same area in which an entangled dolphin is located)? Is there a potential for other small cetaceans to approach and disrupt the target animal or responders during capture? Are there other large predators of safety concern for rescue personnel (*e.g.,* sharks, alligators, etc.)? Consider other natural and cultural resources nearby.
- ***Egress****:* Has the team assessed all possible hazards in the capture zone? Is there a safe place for the non-entangled animals to egress? What hazards are in the capture zone that could potentially cause additional injury to the entangled animal and surrounding animals?
- ***Team composition:*** Are there adequate responders with the appropriate level of expertise and experience to safely complete the mission and address unforeseen situations? If a veterinarian or veterinary technician is necessary, are there sufficient personnel to assist with the entanglement response so the veterinary staff can monitor/treat the animal. Ensure that all involved fully understand their roles and everyone understands what warning signs to look for. Designate a human safety officer to monitor fatigue, injury, and personnel throughout the response.
- ***Public presence:*** Is the response going to be in a public area? Ensure adequate crowd control and outreach. Consider a public briefing after the event. Expect to be recorded or live streamed and ensure that all involved look and behave appropriately. Carefully consider clothing/logos that will be seen by the public, to help the public to recognize the professionalism of the team.

2) **The Go/No Go decision matrix.** Example matrix modified from one used for pinniped entanglement response.

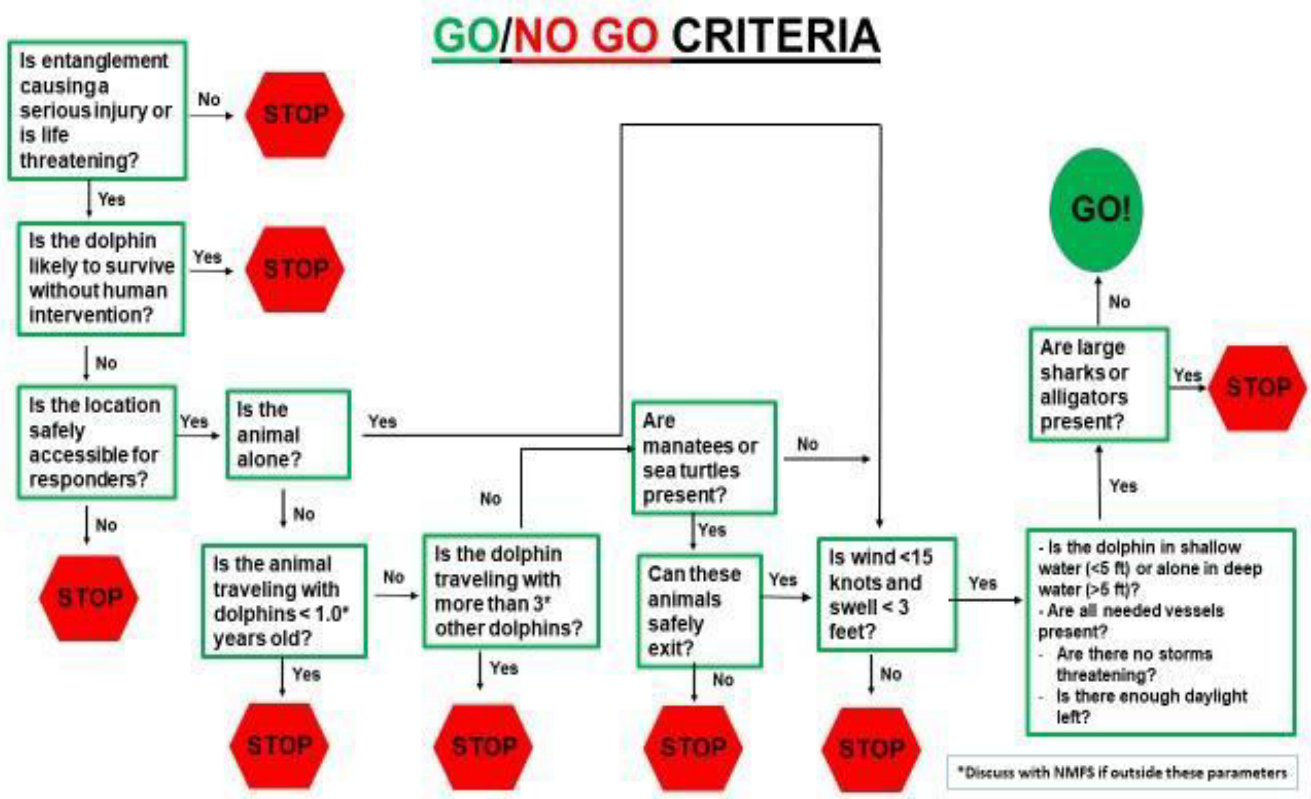

Figure 2-1. General example of a Go/No Go decision matrix based on permit requirements (created based on flowchart provided by the Alaska Department of Fish and Game Steller sea lion program), also see Appendix G.

2.13. Procedure

Procedures will vary depending on the type of entanglement response and will be presented in detail in each specific response type section (see Sections 3.10, 4.10 and 5.10). Across all types of responses, the general sequence of events include:

1) Hold a team briefing before the response occurs so team members know their duties.
2) Ensure there is adequate security and crowd control in place, if necessary.
3) The IC and CL will ensure all personnel and equipment are ready and perform the final Go/No Go determination (if there is ANY question of increased risk, abort).
4) All camera and video monitoring equipment is operational and recording.
5) The team locates the animal and remotely assesses any changes in condition or entanglement.
6) If the animal still needs intervention, IC and CL will assess the environment, animal condition/entanglement, etc. and issue the Go/No Go order for operations (remote or in- water techniques).

7) The team gets into position, approaches, remotely disentangles, or captures the animal.

8) If captured, the animal is immediately monitored and assessed for any signs of respiratory or circulatory distress and treated accordingly.

9) The captured animal is disentangled, entangling gear/debris are collected, the wound is cleaned and treated, and medications are administered (if needed), photos are obtained of the gear in- place and final photos of the animal without the gear, and of tags in place if used. Additionally, sex is determined, length is measured, it is marked or tagged (if safe to do so), pictures of the dorsal fin are taken for identification purposes, and additional data are recorded. Euthanasia solutions should be kept on hand in case there is a need for euthanasia. Antibiotics or other medications may be used to treat injuries.

10) The captured animal is released (and if not identifiable the animal may be marked/tagged to aid in post-release monitoring), or if additional care is warranted, is transported to a rehabilitation center, or euthanized if the injury is too severe. If euthanized, the carcass is transported to a necropsy facility for complete necropsy.

11) The team conducts a debrief and completes a fully documented report (*e.g.*, Level A, HI Form, Entanglement Form – see Appendices).

12) The gear is cleaned, packed, and organized for the next response.

3 Small Cetacean Entanglement Response Techniques – Remote Interventions for Free-swimming Small Cetaceans

This section can be used as a stand-alone overview of how to safely respond to, and remotely disentangle, free-swimming small cetaceans. Remote disentanglement techniques usually involve one to two vessels and several close approaches to the entangled small cetacean using remote disentanglement tools (*e.g.*, cutting pole, cutting grapples) to cut the entangling gear/debris.

3.1. Preparation

Prior to any operation:

- Practice, practice, practice! The more the team practices ahead of time, the better prepared they will be for the unexpected.
- Consult tide charts, weather forecasts, other environmental parameters.
- Choose experienced team members and assign roles.
- Create and distribute an Incident Command System (ICS) Incident Action Plan (IAP) type document.
- Distribute safety protocols for responders review.
- Check equipment, communication, and medical supplies.
- Confirm the operation of all vessels (fuel and maintenance, if needed).
- When necessary, arrange for additional personnel, better visualization of the entangled animal and better control of onlookers in the area.
- Ensure all equipment is clean, organized, packed, and ready for operations.

24 – 72 hours prior to operation:

- Check marine weather forecasts.
- Notify appropriate entities such as NMFS Regional Stranding Coordinator (RSC), and law enforcement.
- Ensure appropriate authorization (*i.e.*, NMFS approval, and other approval if response in park or preserve).

Immediately prior to operation:

- Conduct safety briefing.
- Re-check marine weather forecasts.
- Consult decision matrix – prior to operations, and again once on-scene, determine if conditions allow for safe operations then make a final decision about response.

3.2. Training

Responders must be trained by experienced personnel in safe use of small boats, remote disentanglement tools, monitoring, etc. Advancement in use of remote disentanglement tools requires hands-on experience under the direct supervision of experienced response staff. If possible, inexperienced personnel should watch the process and participate in secondary aspects of the response to gain more experience. Personnel should document their training and skills so the response coordinator who is choosing the team has a current list of team abilities. Although there are currently no formal national training programs in place, the MMHSRP or RSC can direct responders toward resources relevant to the species of interest, whenever available and NMFS is working to develop a training tracking system for future use.

3.3. Human/animal safety

Because of the inherent risks encountered during an entanglement response, methods used to disentangle an animal should minimize risk, stress, and pain to the animal while also ensuring the safety of both the animal and responders. A broad list of human and animal safety procedures are below.

1.21.1. Human safety

Equipment and personal protective equipment (PPE)

- Have a written safety protocol with emergency numbers to be kept with first aid kits.
- All personnel must wear appropriate PPE, dress suitably for the weather conditions, and have appropriate footwear for working on a vessel.
- Other recommended protective gear includes eyewear (including sunglasses, preferably polarizing), helmets, and gloves if handling remote cutting tools.

Safety equipment

- Ensure first aid kits are on each vessel.
- Use radio/other communication equipment.
- Vessels should contain safety equipment that conforms to USCG regulations (*e.g.,* PFDs for all crewmembers, fire extinguisher, flares, navigation lights if applicable, etc.) and be appropriate to the role each vessel plays in the response operation.

Operational safety

- Responders must meet minimum qualifications and training prior to conducting procedures.
- Float plans should list an assigned point of contact on land.
- Responses should not be conducted in poor weather, lighting, or sea conditions.
- Designated Human Safety Officer(s) should continually watch over all team members involved and be able to communicate to the IC or CL about human safety risks.

- Assess how to safely reach the animal and egress after the response. Consider tide, weather, time of day, other environmental factors, and other animals in the area.

Report injuries, incidents, or PPE failures to the Human Safety Officer immediately.

- Any significant accident or injury requires that operations cease and the event, person, or injury be immediately addressed.
- Depending on the situation, the decision is made by the IC and/or CL whether to continue or discontinue operations for the day.
- Appropriate response staff are trained in basic first aid and CPR. First aid kits are readily available.
- Use a hooked/curved/covered blade for cutting to minimize accidental injury to handlers and the animal. Stow the implement safely when finished.

Presence of public or bystanders

- If response is in a public area, ensure there is sufficient crowd control and outreach.
- Ensure observing public are informed where possible/practical and ensure they stay a safe distance away from the rescue operation.

1.21.2. Animal safety

Environmental hazard assessment

- Use a decision matrix prior to the response to ensure risks and mitigation are planned and accounted for by all responders and properly mitigated.
- Prior to the response, survey the surroundings to identify any environmental hazards that might pose a threat to responders or the animal.

Disturbance (other cetaceans and wildlife)

- Reduce all forms of disturbance to the entangled animal and any nearby animals (*e.g.*, if the animal is within a group) as much as possible by keeping noise to a minimum.

Time limits

- For remote disentanglement, responders should minimize close approaches and take breaks between disentanglement attempts if the animal shows disturbance behavior.
- The number of disentanglement attempts per day or over consecutive days should be evaluated on a case-by-case basis, including the severity of the animal's injury and the individual animal's response to disentanglement attempts.
- If the animal shows strong avoidance or aggressive behaviors stop all entanglement response activities and give the animal a cool-down period (10-20 minutes). If these behaviors continue after two cool-down periods abort the entanglement response for that day.

Remote disentanglement tool deployments

- Ensure all equipment is in working order prior to deployment.
- Where possible, approach or maneuver the disentanglement vessel closest to the animal to allow for deployment of remote tools.
- If not possible prior to the response, assess where the entangling material is easiest to access and cut away. Also, identify the fewest cuts needed to release the animal to reduce handling time and stress to the animal.
- Sterilize any sampling or tagging tools that were exposed to the animal.
- Clean and dry all equipment after response and stow securely where it can be accessed for future use.

3.4. Team Member Roles

The remote disentanglement of small cetaceans has inherent risk for both the responders and the animals. Clarifying team member roles and responsibilities ahead of time, and ensuring that responders meet minimum qualifications for each role is essential to a safe and successful response. The recommended roles that follow are based, in part, on implementation of the ICS. This system provides a structure for clarity of communications and roles, and efficient management of resources. ICS is scalable and can be modified to fit the needs of the operation. Safety is always at the center of any plan based on ICS. The number of responders needed for a response varies widely depending on the size, strength, and location of the animal (Table 3-1).

Table 3-1. Suggested number of personnel required for a remote entanglement response.

Team member role	Number of personnel required
Incident Commander/Capture Lead	1
Human Safety Officer	1
Small Boat Operator(s) (may use anywhere from 1-3 vessels)	1-3
Disentanglement Tool Operator(s)	1-2
Data Collector/Photographer(s)	1-2
Security/Crowd Control	variable
Optional–Veterinarian/Veterinary Technician	1
Optional – Communications Officer	1
Optional – Unmanned Aerial System Operator	1

Specific team member roles and qualifications for each role are listed below. In some circumstances, roles can be combined (*e.g.*, documentation and data collection).

- **Incident Commander (IC)/Capture Lead (CL)** - For remote responses the incident commander (IC) and capture lead (CL) may be combined in one person. In these cases, the IC/CL is responsible for all on-water activities and resources needed to conduct and maintain safe and efficient operations. If more than one vessel is used, the IC/CL coordinates the deployment of the other vessels while searching for the target cetacean(s). The IC/CL makes the final call on when and where to approach the cetacean for remote disentanglement attempts. The IC/CL ensures that the response is as safe as possible for responders, the target animal, other animals, and the public.
    - **Qualifications** – Experience conducting remote disentanglement activities. Experience working around small cetaceans including close approaches and general vessel operations. Experience monitoring and detecting stress reactions in small cetaceans. The ability to remain objective to ensure safe operations and willingness to stop operations if there is a safety concern. Communication skills are important to the role. Ability to brief the response team beforehand, communicate w/ the various vessels on the water, and the veterinary team as needed.
- **Human Safety Officer (SO)** – The HSO is responsible for continually watching over all personnel involved in a response and has the ability to communicate to the IC or CL about human safety risks.
    - **Qualifications** – Ability to watch over all personnel involved, provide first aid as needed.
- **Small Boat Operator** – For remote entanglement responses, small boat operators are an essential component to a successful operation. Small boat operators are responsible for ensuring that vessels are safely maneuvered around animal(s), and that vessels are safely handled in various conditions, such as inclement weather, sea state, currents, tides, surrounding vessel traffic, etc. Small boat operators should be experienced with animal close approaches.
    - **Qualifications** - USCG boat training or equivalent. Because many of these duties are outside the scope of normal boat operations, skills should be practiced prior to working with small cetaceans around the boat. Experience maneuvering in tight spaces, ability to remain calm under pressure, and remain focused under potentially hectic circumstances. Experience driving vessels around cetaceans.
- **Disentanglement Tool Operator** - The disentanglement tool operator is responsible for using remote cutting tools from a vessel to disentangle the free-swimming small cetacean. Tools may include cutting poles, cutting grapples, or other types of remote cutting equipment. The disentanglement tool operator must know how to use the remote tools safely to minimize injury to the target cetacean, nearby animals, and response personnel.

- **Qualifications** – Experience in using remote disentanglement tools and experience working around free-swimming small cetaceans. The ability to remain calm under pressure.

- **Data Collector** – The data collector is essential in recording all aspects of the entanglement response. This person is responsible for ensuring all data are complete on the data sheets, the animal is given an identifying number, all marks, dorsal fin features, and satellite-linked tag numbers (PTT and S/N) are recorded, and all samples and gear are properly recorded and labeled.
    - **Qualifications** – Familiarity with data sheet and information to be recorded, attention to detail, and ability to accurately record data legibly.
- **Photographer or Videographer** – This person is responsible for operating still or video photography to document the response. This person may also serve as the data collector.
    - **Qualifications** – Experience using photographic equipment. Knowledge of how the equipment operates, how to change settings, troubleshoot, take clear and meaningful photos and video including dorsal fin pictures, and ability to post-process photos/video after the capture.
- **Security/Crowd Control (Variable)** – The IC/CL should ensure that the proper on- water authorities (*i.e.*, marine patrol, USCG) in the area have been notified of the response and the area is restricted or closed to public access during the response, if necessary.
    - **Qualifications** – Knowledge of proper authorities to notify.
- **Veterinary Staff (Optional)** – The veterinary staff is responsible for the health and monitoring of the entangled animal during the response and until the animal is safely disentangled and on its own. Based upon the type of remote response, veterinary staff may not be needed for each response. Having veterinary staff available for consultation via cell phone or radio is encouraged.
    - **Qualifications** – A licensed Doctor of Veterinary Medicine (DVM) or equivalent, or veterinary technician experienced in small cetacean medicine.
- **Communications Officer (Optional)** – The communications officer is responsible for communicating information about entanglement response to the public and media. For high profile cases or cases conducted under the permit, messages should be coordinated with all participating organizations and cleared with NMFS.
    - **Qualifications** – Effective communicator in writing and speaking. Communication should be clear, concise, accurate, coherent, and courteous.
- **Unmanned Aerial System Operator (UAS; Optional)** - If permitted to operate an UAS during the remote response, the UAS pilot must have no other duties. The pilot must be in communication with the IC/CL and immediately cease operation if the UAS is in any way negatively impacting the success of the

disentanglement or causing any disturbance to the target or other animals.

- **Qualifications** – A certified pilot's license, a permit to operate during a capture (requires prior approval if under the MMHSRP's MMPA/ESA permit), follow all existing FAA and any other regulations, and experience operating a UAS during previous small cetacean field operations.

3.5. Environmental Conditions

Create a risk assessment tool (Appendix F – Risk Factor Table) or decision matrix (Appendix G – Decision Matrix (Go/No Go) to determine whether an entanglement response is safe for responders and small cetaceans based on environmental conditions. Assess the following environmental conditions prior to small cetacean remote disentanglement response:

- Weather conditions (*i.e.*, rain, snow, fog, wind, sea state, approaching storm systems, heat, cold).
- Submerged hazards (*i.e.*, sand bars, rocks, coral reefs, sunken debris, aquaculture infrastructure, oyster bars, etc.).
- Location of the animal in relation to the surf zone.
- Tide (*i.e.*, incoming or outgoing tide, increased surf, currents).
- Time of day (*e.g.*, response too close to sunset leading to activities occurring at night).

3.6. Equipment

Data and documentation supplies

- Entanglement Response forms (*i.e.*, Level A, Human Interaction Data Sheet, Photo-ID form, Disentanglement form, etc.)
- Pencils/clipboard
- Watch with timer
- Camera and/or video camera (*e.g.*, GoPro), extra batteries

Sampling supplies

- Sampling kit (*e.g.*, forceps, cryovial for skin if present on retrieved gear)

Protective clothing

- Footwear appropriate for vessel
- Protective clothing (*e.g.*, PFD, raingear, helmet, etc.)
- Non-permeable work gloves (if handling cutting tools)
- Optional - eyewear, etc.

<u>Human medical equipment</u>

- First aid kit (optional AED)

<u>Cutting tools</u> (*below*) Cutting Pole

There are a variety of different cutting tools that can be used to cut entangling material. When using a “hooked fixed pole knife” to cut an entanglement without restraining the animal, a stainless steel knife fabricated into a “V” shape with a threaded fitting that attaches to an aluminum or carbon fiber pole that can be extended by adding sections, works well.

Cutting Grapples

<u>Cleaning/disinfecting supplies</u>

- Antibacterial soap/hand sanitizer
- Disinfectant solution (*e.g.,* chlorhexidine, 70% ethanol, etc.)
- Spray bottle for disinfectant solution
- Garbage bag(s) or other container(s) to separate gear and clothing

<u>Miscellaneous supplies</u>

- Cooler/waterproof case/Backpack/Bucket (to carry supplies)

3.7. Data Collection

It is important that supply checklists and data needs are well thought out prior to the start of any entanglement response. Data forms and instructions should be readily available during a response. Important forms to have on hand include: applicable permits, Level A and Human Interaction Forms (Appendix B – Level A and Human Interaction Form), gear checklists (*e.g.*, Appendix C- Gear Checklist), and disentanglement forms (*e.g.*, Appendix D – Disentanglement forms), and respiration rate form (*e.g.,* Appendix E - Respiration rate form). All entangling gear should be retained (if possible), documented on the Level A and Human Interaction Forms, and stored in a centralized location or sent to a NMFS gear repository, please consult with the RSC on appropriate repositories by region.

3.8. Risks and Mitigation

To minimize risks to human responders, animals, and, in some cases, the general public, a comprehensive entanglement response safety plan should be implemented. A safety briefing should occur prior to each entanglement response. In addition, a risk analysis matrix should be completed to guide responders in making safe decisions regarding the response to entangled small cetaceans.

Responders should prepare, plan, and practice for possible risks and identify mitigation measures for these risks prior to any response. After each response, the team should conduct a thorough debrief with lessons learned that can be applied to the next response. When responding to entangled small cetaceans, the list of risks and mitigations is never complete. There is always room for improvement and documents should be updated continually.

This section outlines and assesses risks specific to remote disentanglement of free-swimming small cetaceans and how to mitigate these risks.

RISKS TO HUMANS

Risk: *Injury or death to personnel by falling or drowning.*

***Mitigation*:**

- Responders should wear appropriate PPE such as strong, non-slip footwear, PFDs, gloves, protective clothing, and helmets as necessary.
- Designated HSO should be assigned to continually watch over all personnel involved and be able to communicate to the IC or CL about human safety risks.
- Designated personnel should be watching for and warning the team of hazards such as waves and other animals.

Risk*:* *Injury to personnel from remote tool use (e.g., cuts, punctures, etc.).*

***Mitigation*:**

- Remote tool operators should wear appropriate PPE such as strong, non-slip footwear, gloves, protective clothing, and helmets as necessary.
- Remote tool operators should be mindful of the sharpness of the cutting tools and grapples and handle them accordingly.

RISKS TO ANIMALS

Risk: *Injury to animal from remote cutting tools.*

***Mitigation*:**

- Proper evaluation of existing animal injuries should be conducted before response attempt if possible.
- Use cutting tools that minimize injury to the animal and are designed to cut only the entangling gear/debris. Use cutting tools of appropriate size for the species.

Risk: *Unintentional disturbance of non-target animals.*

***Mitigation*:**

- Possibility of unintentional disturbance of non-target animals should be evaluated before and during remote entanglement response activities.
- Appropriate "take" (harassment of any marine mammal; or, the attempt at such) approval and documentation to disturb non-target animals should be complete.
- Efforts to minimize disturbance to non-target animals should always be considered.
- Designated personnel should continuously watch for the presence of non-target animals in and around the response area throughout the response, and communicate with the team appropriately.
- Dependent calves often surface unpredictably relative to their mother's location; care must be taken to not injure them inadvertently while trying to disentangle the mother.

Risk: *Animal fatality.*

***Mitigation*:**

- Personnel to be trained in techniques that minimize injury to animals.
- NMFS must be notified immediately. The animal should be recovered, a full necropsy performed, and a final report sent to NMFS. A debrief with NMFS should occur to discuss mitigations.
- Entanglement response activities should immediately cease until a necropsy is completed and

new mitigation measures are approved by NMFS.

3.9. Intervention Criteria/Decision Matrix (Go/No Go)

A risk assessment tool (Appendix F – Risk Factor Table) or decision matrix (Appendix G – Decision Matrix (Go/No Go) should always be used prior to any response. For remote responses, factors that should be considered include environmental conditions, team selection and fitness, small cetacean selection and condition, type of entanglement and location on the body, permission, resources, and mission complexity.

3.10. Procedure

Optimal remote entanglement response situation

- Water location without any marine hazards
- Clear, calm water
- Solitary animal
- Animal is traveling in a consistent pattern and speed
- Close approach by the vessel is being accepted by animal
- Gear is trailing and/or loosely wrapped around the animal

Animal close approach and remote disentanglement attempts

1) **Risk assessment tool or Go/No Go determination:** Consult to determine if a safe remote entanglement response is feasible. Criteria will be based on authorization requirements and decision matrices.

2) **Assign team roles and review plan:** Before responding to any animal, be sure everything is ready. Double-check all the equipment and supplies. Identify the IC/CL, review the response scenario and all procedures, any emergency response, and the sequence of the activities. Discuss when a response should be aborted and who makes the decision. Assign roles for each team member (and backups) for every part of the response, and confirm the team members fully understand, are capable, and are mentally prepared. Review animal warning signs to monitor and the appropriate emergency response actions. Discuss ideal cuts to be attempted to remove entangling gear/debris. The IC/CL will ensure all personnel and equipment are ready and perform the final Go/No Go determination.

3) **Identify candidate animal:** The entangled animal will be identified, and its position, size, age, sex (if possible to determine), and placement among other animals noted.

4) **Secure the area:** If necessary, onlookers will be notified and asked to clear the area.

5) **Modify protective clothing and personal effects to minimize injury during the response event:** Remove rings from fingers or wear gloves, remove jewelry, tie hair back, check clothing for buttons or entangling points and modify as appropriate to reduce entanglement/tripping risks.

6) **Documentation:** The documentation person will ensure all photo and video equipment is on and recording.

7) **Time limits:** Record the time of day, time of each close approach and remote attempt, and beginning and ending of cutting time (from when the remote tool actually first cuts the line and when it finishes). Record number of remote attempts per hour and per response day.

8) **Close approach:** The remote entanglement response vessel will approach quietly and calmly, and position itself in the best position for the remote cutting tools to be deployed (cutting pool, cutting grapple, etc. – *see tool section above*).

9) **Monitoring and assessment:** Throughout the effort the animal should be assessed for any signs of avoidance or abnormal behavior. Monitor the breathing, swimming speed, and diving behavior of the animal during the deployment of the remote cutting tools. If the animal shows strong avoidance or aggressive behaviors stop all entanglement response activities and give the animal a cool-down period of (10-20 minutes). If these behaviors continue after two cool- down periods reassess the entanglement response for that day.

10) **Data collection:** Record appropriate response data completely on Level A and Human Interaction Forms, and any other necessary response forms.

11) **Disentanglement:** The entangling material should be cut using an appropriate remote cutting tool (*e.g.,* pole, grapple, etc.). Ideally, the gear will shed during the disentanglement operation or later over several days. Occasionally a cutting tool may become entangled in the gear impeding the animal's ability to swim and the animal then becomes anchored. At this point, anchored animal techniques as described in Section 4 may be used to disentangle the animal. Whenever possible entangling gear should be retained, documented, and archived or sent to a gear repository for analysis, please consult with the RSC on appropriate repositories by region.

12) **Monitoring post-disentanglement:** After the entanglement is removed, continue to monitor the animal from a safe distance for ~15 minutes to assess respiration rate, swimming, diving and general behavior prior to leaving the animal. Ideally, additional post-entanglement monitoring and photo-documentation of the animal will be conducted over the following days to weeks.

13) **Post-response debrief:** The entire team discusses the response, gives constructive feedback, and brainstorms on areas that need improvement. It is important to discuss as a team within 24 hours of the capture while memories of the event are fresh. Debrief notes should be added to the final report.

14) **Disinfecting/disposal:** If protective reusable clothing (*e.g.*, coveralls, footwear, PFDs) are soiled, they must be cleaned and disinfected before reuse. All contaminated reusable equipment and gear must be treated including cutting tools, specimen supplies, and other miscellaneous items (*e.g.*, buckets, clipboards, writing implements, etc.).

15) **Submit reports:** Ensure all datasheets and reports are complete, appropriately reviewed by team members, and submitted where appropriate.

16) **Prepare again:** Clean and organize gear so it is ready for future use.

4 Small Cetacean Entanglement Response Techniques – Remote Interventions for Anchored Small Cetaceans

This section has been prepared to be used as a stand-alone overview of how to safely respond to and remotely disentangle small cetaceans that are anchored. Entanglement response techniques for anchored small cetaceans usually involve one to two vessels and close approaches to the entangled and anchored small cetacean, either using remote disentanglement tools to cut the entangling line, or by briefly restraining the small cetacean alongside the vessel and disentangling by hand. Occasionally anchored animals may be in shallow water, and an in-water response may be possible if handlers are able to stand and disentangled the dolphin safely. The remote disentanglement of small cetaceans that are anchored has inherent risk for both the responders and the animals. Anchored animals generally need to be responded to within < 24 hours; consequently there will be less time for planning and preparation and increased risks to the animal of drowning and death.

4.1. Preparation

Prior to any operation:

- Practice, practice, practice! The more the team practices ahead of time, the better prepared they will be for the unexpected.
- Consult tide charts, weather forecasts, other environmental parameters.
- Choose experienced team members and assign roles.
- Create and distribute an Incident Command System (ICS) Incident Action Plan (IAP)-type document.
- Distribute safety protocols for responder review.
- Check equipment, communication, and medical supplies.

- Confirm the operation of all vessels (fuel and perform maintenance, if needed).
- When necessary, arrange for additional personnel, better visualization of the entangled animal, and better control of onlookers in the area.
- If available and using satellite-linked transmitters, ensure transmitters are programmed and ready to deploy.
- Ensure all equipment is clean, organized, packed, and ready for operations.

24– 72 hours prior to operation:

- Check marine weather forecasts.
- Notify appropriate entities such as NMFS Regional Stranding Coordinator (RSC), enforcement, and rehabilitation facility to inquire about available space.
- Ensure appropriate authorization (*i.e.*, NMFS approval and other approval if response in park or preserve).

Immediately prior to operation:

- Conduct safety briefing.
- Re-check marine weather forecasts.
- Consult decision matrix – prior to operations, and again once on-scene, determine if conditions allow for safe operations and make a final decision about response.

4.2. Training

Responders must be trained by experienced personnel in safe use of vessels, remote disentanglement tools, handling, monitoring, etc. Advancement in use of remote disentanglement tools and response to anchored small cetaceans requires hands-on experience under the direct supervision of experienced response staff. If possible, inexperienced personnel should watch the process and participate in low- level aspects of the response to gain more experience. Personnel should document their training and skills so the response coordinator who is choosing the team has an up-to-date list of team abilities.

Although there are currently no formal national training programs in place, the MMHSRP or RSC can direct responders toward resources relevant to the species of interest, whenever available and NMFS is working to develop a training tracking system for future use.

4.3. Human/animal safety

Because of the inherent risks encountered during an entanglement response, methods used to disentangle an animal should minimize risk, stress, and pain to the animal while ensuring the safety of both the animal and responders. A broad list of human and animal safety procedures can be found below.

1.31.1. Human safety

Equipment and personal protective equipment (PPE)

- Have a written safety protocol with emergency numbers to be kept with first aid kits.
- All personnel must wear appropriate PPE, including PFD's, dress suitably for the weather conditions, and have appropriate footwear for working on a vessel.
- Other recommended protective gear includes eyewear (including sunglasses, preferably polarizing), helmets, and gloves if handling remote cutting tools. Masks should be available for use at handler discretion if they will be interacting closely with the animal, based on risk and environment.

Safety equipment

- Ensure first aid kits are with each response group.
- Use radio/other communication equipment.
- Knives, restraint equipment (if the animal is restrained against the vessel).
- Vessels should contain safety equipment for vessels that conform to USCG regulations (*e.g.,* PFD, fire extinguisher, flares, navigation lights if applicable, etc.) and be appropriate to the role each vessel plays in the response operation.

Operational safety

- Responders must meet minimum qualifications and training prior to conducting procedures.
- Float plans should list an assigned point of contact on land.
- Responses should not be conducted in poor weather, lighting, or sea conditions.
- Designated Human Safety Officer(s) should continually watch over all team members involved and be able to communicate to the Incident Commander (IC) or Capture Lead (CL) of human safety risks.
- Do not wrap net or line around hands or fingers, remove entanglement hazards (rings, watches), and keep feet clear.
- Assess how to safely reach the animal and egress after the response. Consider tide, weather, time of day, other environmental factors, and other animals in the area.

Report injuries, incidents, or PPE failures to the Safety Officer immediately.

- Any significant human accident or injury requires that operations cease and the event, person, or injury immediately addressed.
- Depending on the situation, the decision is made by the IC and/or CL whether to continue or discontinue operations for the day.
- Appropriate response staff are trained in basic first aid and CPR. First aid kits are readily available.
- Use a hooked/curved/covered blade for cutting to minimize accidental injury to handlers and the animal, and cut away from yourself. Stow the implement safely when finished.

Presence of public or bystanders

- If response is in a public area, ensure there is sufficient crowd control and outreach.
- Ensure observing public are informed where possible/practical and ensure they stay a safe distance away from the rescue operation.

1.31.2. Animal safety

Environmental hazard assessment

- Use a decision matrix prior to the response to ensure risks and mitigation are planned and accounted for by all responders and properly mitigated.
- Prior to the response, survey the surroundings to identify any environmental hazards that might pose a threat to responders or the animal.

Disturbance (other cetaceans and wildlife)

- Reduce all forms of disturbance to the entangled animal and any nearby animals (*e.g.*, if the animal is within a group) as much as possible by keeping noise to a minimum.

Remote disentanglement tool deployments

- Ensure all equipment is in working order and that all cutting instruments are honed to a fine edge prior to deployment.
- Where possible, approach or maneuver the disentanglement vessel closest to the animal to allow for deployment of remote tools.
- If not possible prior to the response, assess where the entangling material is easiest to access and cut away. Also, identify the fewest cuts needed to release the animal to reduce handling time and stress to the animal.
- Sterilize any sampling tools that came into contact with the animal.
- Clean and dry all equipment afterwards and stow securely again ready for future use.

Restraint devices and restraining anchored animals

- When the animal is restrained, ensure it is secured appropriately so that it is still able to breathe comfortably and protected from injury from the vessel if it spins, rolls or flukes (*e.g.*, have padding between hard-sided vessels and the animal's head).
- Once restrained, if not possible prior to capture, assess where the entangling material is easiest to access and cut away. Also, identify the fewest cuts needed to release the animal to reduce handling time and stress to the animal. Peel the entangling material out of the wound rather than dragging it or pulling it out from one side; this will minimize pain and prevent further injury.
- Assess whether the animal is suitable for immediate release, requires transport to rehabilitation, or requires euthanasia, and act as appropriate.
- Ensure transport method is safe and secure for the size and strength of the animal if being

transported to rehabilitation.

- Sterilize any sampling tools that were exposed to the animal.
- Clean and dry all equipment afterwards and stow securely again ready for future use.

4.4. Team Member Roles

The remote disentanglement of small cetaceans that are anchored has inherent risk for both the responders and the animals. Anchored animals generally need to be responded to within 24 hours; therefore there will be less time for planning and increased risks to the animal of drowning and death. Clarifying team member roles and responsibilities ahead of time, and ensuring that responders meet minimum qualifications for each role is essential to a safe and successful response. The recommended roles that follow are based, in part, on implementation of the ICS. This system provides a structure for clarity of communications and roles, and efficient management of resources. ICS is scalable and can be modified to fit the needs of the operation. Safety is always at the center of any plan based on ICS. The number of responders needed for a response varies widely depending on the size, strength, and location of the animal (Table 4-1).

Table 4-1. Suggested number of personnel required for a remote entanglement response of an anchored small cetacean.

Team member role	Number of personnel required
Incident Commander/Capture Lead	1-2
Human Safety Officer	1
Small Boat Operator(s) (may use anywhere from 1-3 vessels)	1-3
Disentanglement Tool Operator	1-2
Data Collection/Photographer	1-2
Security/Crowd control	variable
Optional - Animal Handler (if anchored animal is restrained alongside vessel or in-water)	3-5
Optional–Veterinarian/Veterinary Technician	1
Optional – Communication Officer	1
Optional – Unmanned Aerial System Operator	1

Specific team member roles and qualifications for each role are listed below. In some circumstances, roles can be combined (*i.e.*, documentation and data collection).

- **Incident Commander (IC)/Capture Lead (CL)** - For anchored animals, the IC and CL may be combined in one person. The IC or CL is responsible for all on-water activities and resources needed to conduct and maintain safe and efficient operations. If more than one vessel is used, the IC/CL coordinates the deployment of the other vessels while searching for the target small cetacean(s). The IC/CL makes the final call on when, how, and where to approach the cetacean for remote disentanglement attempts. For an anchored small cetacean, the IC/CL will make decisions and direct the most experienced people to restrain the animal alongside the vessel, if appropriate. The IC/CL ensures that the response is safe for responders, the public, and animals.
    - **Qualifications** – Experience conducting remote disentanglement activities. Experience working around small cetaceans include close approaches and vessel operations. Experience monitoring and detecting stress behavior in small cetaceans. The ability to remain objective to ensure safe operations and willingness to stop operations if there is a human or animal safety concern. Communication skills are important to the role. Ability to brief the response team beforehand, communicate w/ the various vessels on the water, and the veterinary team as needed.
- **Human Safety Officer (SO)** – The HSO is responsible for continually watching over all personnel involved in a response and has the ability to communicate to the IC or CL about human safety risks.
    - **Qualifications** – Ability to watch over all personnel involved, provide first aid as needed.
- **Small Boat Operator** – For anchored entanglement responses, the small boat operators are an essential component to a successful operation. The small boat operators are responsible for ensuring that vessels are safely maneuvered around animal(s) in the water, and that they are safely handled in all types of weather and sea state conditions including currents, tides, wind, etc. Small boat operators should be experienced with animal close approaches, and restraint of animals alongside the boat.
    - **Qualifications** – United States Coast Guard boat training or equivalent. Because many of these duties are outside the scope of normal boat operations, skills should be practiced prior to working with small cetaceans in or around the boat. Experience maneuvering in tight spaces, ability to remain calm under pressure. Experience driving vessels around cetaceans.
- **Disentanglement Tool Operator** - The disentanglement tool operator is responsible for using cutting tools from a vessel to disentangle the anchored small cetacean. Tools may include knives (*e.g.,* strap cutters), cutting poles, cutting grapples or other types of remote cutting equipment. The disentanglement tool operator must know how to use the tools safely to minimize injury to the target cetacean and response personnel.
    - **Qualifications** – Experience in using remote disentanglement tools and experience working around free-swimming small cetaceans. The ability to remain calm under pressure.

- **Data Collector** – The data collector is essential for recording all aspects of the entanglement response. This person is responsible for ensuring all data are complete on the data sheets, the animal is given an identifying number, all marks, freeze-brand and other tag numbers if used (*e.g.*, roto tag, satellite-linked tag PTT and S/N numbers) are recorded, and all samples are properly recorded and labeled.
    - **Qualifications** – Familiarity with data sheet and information to be recorded and ability to accurately record data legibly.
- **Photographer or Videographer** – This person is responsible for operating still or video photography to document the response. This person may also serve as the data collector.
    - **Qualifications** – Experience using photographic equipment. Knowledge of how the equipment operates, how to change settings, troubleshoot, take clear and meaningful photos and video including dorsal fin pictures for identification purposes, and ability to post-process photos/video after the capture.
- **Security/Crowd Control (Variable)** – The IC/CL should ensure that the proper on- water authorities (marine patrol, USCG) in the area have been notified of the response and the area is restricted to close public access during the response if needed.
    - **Qualifications** – Knowledge of proper authorities to notify.
- **Animal Handlers (Optional)** – If needed for an anchored animal, the animal handlers are responsible for safely restraining the animal against the side of the boa, on the floating mat or in the water (if shallow), and all personnel around the animal are safe from potential injury such as animal bites, blows from head or tail, and scratches. The animal handler holding the head would also be responsible for monitoring the head of the dolphin to ensure it is breathing appropriately while restrained.
    - **Qualifications** - Responders must be trained by experienced personnel in safe capture, handling, monitoring under restraint, etc. Advancement requires hands-on experience under the direct supervision of experienced response staff. This handling experience may occur in a rehabilitation hospital or field research setting. Handlers should also be able to remain calm under pressure, respond effectively to rapidly changing conditions, and work well in a team environment.
- **Veterinary Staff (Optional)** – The veterinary staff is responsible for monitoring the condition of the entangled animal during the response and until the animal is safely disentangled and released. Based upon the type of remote response, veterinary staff may not be needed for each response. For anchored animals, veterinary staff would be desirable to aid with assessment but may not be feasible with the need for a quick response. If veterinary staff are not on-site, they should be available for consultation via cell phone or radio.

- **Qualifications** – A licensed Doctor of Veterinary Medicine (DVM) or equivalent or veterinary technician who is experienced in small cetacean medicine.

- **Communications Officer (Optional)** – The communications officer is responsible for communicating information about entanglement response to the public and media. For high profile cases or cases conducted under the permit, messages should be coordinated with all participating organizations, and cleared with NMFS.
    - **Qualifications** – Effective communicator in writing and speaking. Communication should be clear, concise, accurate, coherent, and courteous.

- **Unmanned Aerial System Operator (UAS; Optional)** - If permitted to operate a UAS during the remote response, the UAS pilot must have no other duties. The pilot must be in communication with the IC/CL and immediately cease operation if the UAS is in any way negatively impacting the success of the capture or causing any disturbance to the target or other animals.
    - **Qualifications** – A certified pilot's license, a permit to operate during a capture, follow all existing FAA and other regulations, and experience operating a UAS during previous small cetacean field operations.

4.5. Environmental Conditions

Create a risk assessment tool (Appendix F – Risk Factor Table) or decision matrix (Appendix G – Decision Matrix (Go/No Go) to determine whether an entanglement response is safe for responders and small cetaceans based on environmental conditions. Assess the following environmental conditions prior to small cetacean remote disentanglement response:

- Weather conditions (*i.e.*, rain, snow, fog, wind, sea state, approaching storm systems, heat, cold).
- Submerged (*i.e.*, sand bars, rocks, oyster bars, coral reefs, sunken debris, etc.) or emergent (channel markers, pilings, docks, anchored vessels, etc.) hazards.
- Location of the animal in relation to the surf zone.
- Tide (*i.e.*, incoming or outgoing tide, increased surf).
- Time of day (*e.g.*, response too close to sunset leading to activities occurring at night).

4.6. Equipment

Data and documentation supplies

- Capture/handling forms (*i.e.*, Level A, Human Interaction, Capture form, Respiration form, etc.)
- Pencils/clipboard
- Watch with timer

- Camera and/or video camera (*e.g.*, GoPro)

Sampling, tagging, and marking supplies

- Measuring kit (*e.g.*, tape measure, ruler)
- Tagging kit (*e.g.*, plastic fin tags, fin notcher, grease pencils, satellite-linked tags, tagging equipment)
- Freeze-branding supplies (*e.g.,* brands as pre-assigned by NMFS, gloves, liquid nitrogen, container for numeral cooling)
- Sampling kit (*e.g.*, cryovial for skin)

Protective clothing

- Footwear appropriate for vessel
- Protective clothing, suitable to the expected environment (*e.g.*, PFD, raingear, helmet, etc.)
- Work gloves (if handling cutting tools)
- Optional - eyewear, etc.

Human medical equipment

- First aid kits for each boat (optional AED)

Animal medical equipment (if anchored and restrained along boat)

- Disentanglement instruments (*e.g.*, hand-held cutting tools, knife, scalpel, wire cutters, hemostats, etc.)
- Wound care kit

Cutting tools (*below***)**

There are a variety of different cutting tools that can be used to cut entangling material. When using a "hooked fixed pole knife" to cut an entanglement without restraining the animal, a stainless steel knife fabricated into a "V" shape with a threaded fitting that attaches to an aluminum or carbon fiber pole that can be extended by adding sections, works well.


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Cutting Grapples

<u>Capture/restraining gear</u>

The equipment used for physical restraint of small cetaceans alongside a vessel may consist of the following but is not limited to: 1) hoop net, 2) restraining straps or rope, or 3) other restraint methods.

<u>Break-away hoop nets (if needed to help control the animal)</u> – A hoop net made from aluminum rod, tubing, and a soft knotless net is placed in front of the animal as it surfaces, with the animals' forward movement in combination with the net handler's skill the animal is enveloped in the net (Asper 1975; Loughlin et al. 2010). The net releases from the frame leaving the animal in the tethered net. The animal can still swim, surface, and breathe during this process. Once in a hoop net the animal can be maneuvered alongside the vessel and

restrained.

Restraining straps – Restraining straps or ropes can be used to restrain an anchored dolphin alongside the vessel. Straps and ropes should be placed around the animal between the pectoral flippers and dorsal fin *(e.g.,* the maximum girth) and around the tailstock to help restrain the dolphin. If the dolphin will be restrained against the boat, a small amount of padding (*e.g.*, PFD) should be used between the cetacean's head and the boat.

Other restraint methods - Under some circumstances it may be beneficial to bring the animal onboard a floating mat alongside the boat, where it can be more easily disentangled, its wounds can be examined and documented more thoroughly, and it is easier to treat wounds, collect data, and mark or tag the animal. In some cases, anchored animals may be in shallow water (or moved to shallow water via a floating mat), in such cases, handlers may be able to enter the water and support and disentangle the animal while standing.

Cleaning/disinfecting supplies

- Antibacterial soap/hand sanitizer
- Disinfectant solution (*e.g.,* chlorhexidine, 70% ethanol, etc.)
- Spray bottle for disinfectant solution
- Garbage bag(s) or other container(s) to separate gear and clothing

Miscellaneous supplies

- Cooler/waterproof case/Backpack (to carry supplies)
- Bucket (to carry supplies and/or to hold water to cool animals)

4.7. Data Collection

It is important that supply checklists and data needs are well thought out prior to the start of any entanglement response. Data forms and instructions should be readily available during a response. Important forms to have on hand include applicable permits, and potentially Level A and Human Interaction Forms (Appendix B – Level A and Human Interaction Form), gear checklists (*e.g.*, Appendix C - Gear Checklist), disentanglement forms (*e.g.*, Appendix D – Disentanglement form), respiration rate form (*e.g.,* Appendix E - Respiration rate form), and priority sample sheet (will vary with each response). All entangling gear should be retained (if possible), documented on the Level A and Human Interaction Forms, and stored in a centralized location or sent to a gear repository for analysis, please consult with the RSC on appropriate repositories by region.

4.8. Risks and Mitigation

To minimize risk to human responders, animals, and, in some cases, the general public, a comprehensive entanglement response safety plan should be implemented. A safety briefing should occur prior to setting out on an entanglement response. In addition, a risk analysis matrix should be completed to guide responders in making safe decisions regarding the response to entangled small cetaceans. Responders should prepare, plan, and practice for possible risks and identify mitigation measures for these risks prior to any response. After each response, the team should conduct a thorough debrief focusing on lessons learned that can in turn be applied to subsequent responses.

When responding to entangled small cetaceans, the list of risks and mitigations is never complete. There is always room for improvement and documents should be updated continually.

This section outlines and assesses risks specific to remote disentanglement of anchored small cetaceans and how to mitigate these risks.

RISKS TO HUMANS

Risk: *Injury or death to personnel by falling, blunt impact, entrapment, or drowning.*

***Mitigation*:**

- Responders should wear appropriate PPE such as strong, non-slip footwear, PFDs, gloves, protective clothing, and helmets as necessary.
- Designated human safety officer should watch over all personnel involved and be able to communicate to the IC or CL about human safety risks.
- Designated personnel should be watching for and warning the team of hazards such as waves, wakes (from passing vessels) and other animals.

Risk*: Injury to personnel from remote tool use (e.g., cuts, punctures, etc.).*

***Mitigation*:**

- Remote tool operators should wear appropriate PPE such as strong, non-slip footwear, gloves, protective clothing, and helmets as necessary.
- Remote tool operators should be mindful of the sharpness of the cutting tools and grapples and handle them accordingly.

RISKS TO ANIMALS

Risk: *Injury to animals from remote cutting tools or from restraint.*

***Mitigation*:**

- Conduct proper evaluation of existing animal injuries before response attempt if possible.
- Use cutting tools that minimize injury to the animal and are designed to cut only the entangling line. Use cutting tools of appropriate size for the species.
- When the animal is restrained, ensure it is secured appropriately so that it is still able to breathe comfortably and it is protected from vessel injury if it spins, rolls or slaps its flukes (*e.g.*, have padding between hard-sided vessels and the animal's head).

Risk: *Unintentional disturbance of non-target animals.*

***Mitigation*:**

- Evaluate the possibility of unintentional disturbance of non-target animals before and during remote entanglement response activities.
- Complete appropriate "take" (harassment of any marine mammal; or, the attempt at such) approval and documentation to disturb non-target animals
- Always consider efforts to minimize disturbance to non-target animals.
- Designated personnel should continuously watch for the presence of non-target animals in and around the response area throughout the response, and communicate with the team appropriately.

Risk: *Animal fatality.*

***Mitigation*:**

- Personnel should be trained in techniques that minimize injury to animals.
- NMFS must be notified immediately. The animal should be recovered, a full necropsy performed, and a final report sent to NMFS.
- Entanglement response activities should immediately cease until a necropsy is completed and new mitigation measures are approved by NMFS.

4.9. Intervention Criteria/Decision Matrix (Go/No Go)

A risk assessment tool (Appendix F – Risk Factor Table) or decision matrix (Appendix G – Decision Matrix (Go/No Go) should always be used prior to any response. For a remote response, factors that should be considered include environmental conditions, team selection and fitness, small cetacean condition, permission, resources, and mission complexity.

4.10. Procedure

<u>Optimal remote entanglement response situation for anchored animal</u>

- Water location without any marine hazards (environmental and physical)

- Solitary animal
- Anchored by fishing gear or marine debris
- Animal tolerates close approach by vessel
- Animal is fatigued or otherwise tired out from entanglement

Animal close approach and remote disentanglement attempts

1. **Risk assessment tool or Go/No Go determination:** Consult to determine if a safe remote entanglement response is feasible. Criteria based on authorization requirements and decision matrices.

2. **Assign team roles and review plan:** Before responding or handling any animal, be sure everything is ready. Double-check necessary equipment and supplies. Review the response scenario and all procedures, any emergency response, and the sequence of activities. Discuss when a response should be aborted and who makes the decision. Assign roles for each team member (and backups) for every part of the response, and confirm the team members fully understand, are capable, and are mentally prepared. Review animal warning signs to monitor and the appropriate emergency response actions. The IC/CL will ensure all personnel and equipment are ready and perform the final Go/No Go determination.

3. **Identify candidate animal:** The entangled animal will be identified, and its position, size, age, sex (if possible to determine), and placement among other animals will be noted.

4. **Secure the area:** If necessary, onlookers will be notified and asked to clear the area.

5. **Modify protective clothing and personal effects to minimize injury during the response event:** Remove rings from fingers or wear gloves, remove jewelry, tie hair back, check clothing for buttons or entangling points and modify as appropriate to reduce entanglement/tripping risks.

6. **Documentation:** The data recorder will ensure all photo and video equipment is on and recording.

7. **Time limits:** Record the start time, time of remote attempts, time of restraint (if applicable), and beginning and ending cutting time (from when the remote or hand tool actually first cuts the line and when it finishes). Record number of remote attempts per hour and per response day (if applicable).

8. **Close Approach:** The remote entanglement response vessel will get into position, approach quietly and calmly, and position itself in the best position for the remote cutting tools to be deployed (cutting pool, cutting grapple, etc. – *see tool section below*).

9. **If animal is anchored (*e.g.*, crab trap, anchored net, other anchored line) and needs to be captured and restrained beside the vessel:**

a. **Capture:** Upon capture, controlling the animal's head is the most critical part of the restraint. Once the animal is restrained, make sure the animal's head is upright and the blowhole is clear and above the water's surface.

b. **Restraint:** Confirm handlers have control over the animal before conducting any procedures. Typically, an animal will struggle, sometimes violently, when initially handled, but will then settle down. The handler at the head of the dolphin should monitor the animal's breathing and responsiveness. When disentangling, sampling, tagging, etc., the person performing these activities should quietly tell the handlers what procedure is next so they can prepare for the animal's potential reaction.

c. Restraining an animal with straps alongside the boat: Restraining straps or ropes can be used to restrain an anchored dolphin alongside the vessel. Straps and ropes should be placed around the animal between the pectoral flippers and dorsal fin *(e.g.,* the maximum girth) and around the tailstock to help restrain the dolphin. Closed cell foam, a PFD or other floatation device (*i.e.*, throwable cushion) can be used to protect the animal's head from hitting the side of the vessel.

d. Restraining with an animal in net (if hoop net used): When restraining with an animal

10. in a net, watch that the animal's eyes, teeth, and pectoral flippers are not caught in the mesh and that the head is not at an unnatural angle. Ensure that netting is not caught in the animal's mouth. Adjust as necessary. Once the net is alongside the vessel, ideally get control lines through the netting so handlers can handle the lines and not use their hands in the netting. Animals may still roll while in a net, but the net and control lines do provide some control over the animal.

11. **Monitoring and assessment:** Once restrained, the animal should be immediately assessed for any signs of respiratory or circulatory distress and treated accordingly. Ensure the animal's blowhole is free and the animal can breathe normally. For most restraints, the front handlers are responsible for monitoring the animal's level of alertness and quality and frequency of respirations throughout the restraint period. It is important to make sure that chest expansion is occurring with each breath. The entire team should be notified if the animal's vitals start to change. The animal's breathing pattern may be somewhat irregular, and it may breath-hold, so vigilance is key. Either a sudden change in breathing pattern, whether an increase or decrease, or a decrease in responsiveness to stimuli raises concern. Check the animal's eyes to see if they are responsive (*i.e.*, is the animal looking around, does it respond to your hand or something that you move into its field of view). Tap its head gently behind the eye with your finger. Check the jaw tone by opening the mouth. Vocalizations are desirable. If the animal does not show some response or its response is slow and the animal does not appear to be attentive, remove the entanglement (if not done already) and abandon other sampling, stimulate the animal, and release the

animal and monitor it. Responders should be conservative in decision-making and err on the side of caution.

12. **Data collection:** Record appropriate response data completely on Level A and Human

13. Interaction Forms, and any other necessary response forms. If animal is restrained, and if time and animal condition allow, also record morphometrics (at least total straight-line length and maximum girth), sex, and collect other samples as necessary.

14. **Disentanglement:** If remote techniques are used, the entangling material should be cut using an appropriate remote cutting tool (*e.g.,* pole, grapple, etc.). Ideally, the gear will shed during the disentanglement operation or later over several days. Once the gear is cut away, it should be retained (if possible) and later documented and archived or sent to a NMFS gear repository for analysis. If the animal is restrained, the entangling material should be removed using an appropriate cutting tool (*e.g.,* knife, scalpel, wire cutters, etc.). The material should then be removed by peeling it out of the wound, rather than dragging it out from one side, to minimize pain and prevent further injury.

15. **Wound care:** If the animal is restrained, the wound should be investigated to assess the extent of tissue damage and to ensure all foreign material has been removed. The wound (if any) may be cleaned with antiseptic and treated topically, though this should be balanced with animal handling time and stress. Many entanglement wounds are open and will be easily flushed with seawater, making wound care less critical. However, if needed, and if the animal is calm enough, responders can conduct wound debridement or administer antibiotics. A broad-spectrum, long-acting antibiotic can be used to treat injuries, but the choice to administer this (or other drugs) is at veterinary discretion. Dilute povidone-iodine or chlorhexidine may be used to flush deep wounds or areas not likely to be easily flushed on their own. Euthanasia solutions should be kept on hand in case there is a need for euthanasia. In the case of a severe wound and if the animal is small enough to transport to a rehabilitation center, surgery may be considered.

16. **Marking and tagging:** If the animal is restrained, temporary identifying marks (*e.g.*, paint stick), longer-term identifying marks (*e.g.,* fin notching, freeze-brands) or dorsal fin tags (*e.g.,* roto tag and/or satellite-linked) can be applied for more visible and long-term identification and follow-up monitoring (Wells 2018).

17. **Releasing the animal:** Confirm that the animal has a clear exit upon release. The CL or the handler that is holding the head of the animal should direct the release and all handlers should release at the same time, typically after a countdown. Be sure to record the time of release. If possible, monitor the animal post-release from a distance for ~15 minutes, while keeping a low profile. Ideally, additional post-

entanglement monitoring and photo-documentation of the animal will be conducted over the next days to weeks to determine if further intervention is warranted, to identify complications from the intervention, or to confirm the success of the operation (Wells *et al.* 2013).

18. **Post-response debrief:** The entire team should discuss the response, provide constructive feedback, and brainstorm on areas that could be improved. It is important to discuss the response as a team as soon as possible and within 24 hours of the response while memories of the event are fresh. Debrief notes should be added to the final report.

19. **Disinfecting/disposal:** If protective reusable clothing (*e.g.*, coveralls, footwear) are soiled, they should be cleaned and disinfected before storage or reuse. All contaminated reusable equipment and gear must be treated including restraining nets, measuring gear (*e.g.*, tape measure and scales), tagging supplies (*e.g.*, tagging pliers/hole punches, etc.), specimen supplies, and other miscellaneous items (*e.g.*, buckets, clipboards, writing implements, etc.). Dispose of used non-permeable gloves in the trash. Place used needles/scalpels in a "SHARPS" container (do not recap needles).

20. **Submit reports:** Ensure all datasheets, reports are completed properly, and submitted where appropriate.

21. **Prepare again:** Clean and organize gear so it is ready for future use.

5 Small Cetacean Entanglement Response Techniques - In-water Capture and Restraint for Free-swimming Small Cetaceans

This section can be used as a stand-alone overview of small cetacean entanglement response for free- swimming small cetaceans that require in-water net capture and restraint. This section is for animals not disentangled using remote techniques or where the entanglement does not lend itself to remote interventions (*e.g.,* tightly wrapped line, unapproachable animal).

5.1. Preparation

Prior to any operation:

- Practice, practice, practice! The more the team practices ahead of time, the better prepared they will be for the unexpected.
- Determine the location where the capture is likely to take place, and identify any concerns.
- Consult tide charts for optimal tide windows.
- Choose experienced team members and assign roles.
- Create and distribute an Incident Command System (ICS) Incident Action Plan (IAP) type document.
- Distribute safety protocols for responder review.
- Check equipment, communication, and medical supplies.
- Confirm the operation of all vehicles and vessels (fuel and maintenance if needed).
- When necessary, arrange for additional personnel, better visualization of the entangled animal and better control of onlookers in the area.
- If using satellite-linked transmitters, obtain appropriate tags, and ensure transmitters are programmed and ready to deploy.
- Arrange with rehabilitation facilities for possible transport and admission should the animal require extended care.
- Ensure all equipment is clean, organized, packed, and ready for operations.

24– 72 hours prior to operation:

- Check marine weather forecasts.
- Notify appropriate entities such as NMFS Regional Stranding Coordinator (RSC), enforcement, EMS or local hospital.
- Keep rehabilitation facilities informed about plans.
- Ensure appropriate authorization (*i.e.*, NMFS approval and other approval if response on park, preserve, private land).

Immediately prior to operation:

- Conduct safety briefing.
- Re-check marine weather forecasts.
- Consult decision matrix – prior to operations and on scene, determine if conditions and time of day allow for safe operations and make a final decision about response.

5.2. Training

Responders must be trained by experienced personnel in safe capture, handling, monitoring under restraint, etc. Additionally, personnel must be trained in small boat operations and have experience handling and tending nets in the water. Advancement in animal handling requires hands-on experience under the direct supervision of experienced response staff. If possible, inexperienced personnel should watch the process and participate in low-level aspects of the response to gain more experience. Personnel should document their training and skills so the response coordinator who is choosing the team has a current list of team abilities. Although there are currently no formal national training programs in place, the MMHSRP or RSC can direct responders toward resources relevant to the species of interest, whenever available and NMFS is working to develop a training tracking system for future use.

5.3. Human/animal safety

See Appendix H for detailed safety concerns for in-water cetacean capture-release operations.

1.41.1. Human safety

Equipment and Personal Protective Equipment (PPE)

- Have a written safety protocol with emergency numbers kept with first aid kits.
- All personnel must be wearing appropriate PPE including appropriate closed-toed footwear for in-water deployment, PFDs, and dress suitable for the weather conditions.
- Other recommended protective gear includes eyewear (including sunglasses, ideally polarizing), etc.
- Masks should be available for use at handler discretion if they will be interacting closely with the animal, based on risk and environment.

Safety equipment

- Ensure first aid kits are on each vessel.
- Use radio/other communication equipment.
- Vessels should contain safety equipment that conforms to USCG requirements (*e.g.,* PFD, fire extinguisher, flares, navigation lights, etc.) and be appropriate to the expected role in the response operation.

Operational safety

- Responders must meet minimum qualifications and training prior to conducting procedures.
- Float plans should list an assigned point of contact on land.
- Responses should not be conducted in poor weather, lighting, or sea conditions.
- Ensure that there are enough personnel to lift nets or animals.
- Have appropriate two-way marine radios or other communication devices.
- Designated Human Safety Officer(s) should continually watch over all team members involved and be able to communicate to the IC or CL of human safety risks.
- Assess how to safely reach the animal and egress after the response. Consider tide, weather, time of day, other environmental factors, and other animals in the area.

Net handling

- Do not wrap net or line around hands or fingers, remove entanglement hazards (rings, watches), and keep feet clear.
- Communicate with the boat operator and other net handlers.
- While all participants should be observing the deployed net as much as possible, have dedicated net observers in case target animal or incidental animal(s) are entangled in the net.
- Remove the net from the water as quickly as possible after animals are restrained.

Predators/other wildlife

- When operating in waters where manatees are found, a designated manatee observer is required on each vessel.
- Check for predators (*e.g.,* sharks, killer whales, alligators) and other hazardous wildlife *(e.g.,* stingrays, jellyfish) before operations and have a spotter during water operations, including checking the net for incidentally entangled sharks, or other marine wildlife (*e.g.,* sea turtles, manatees).

Report injuries, incidents, or PPE failures to the Human Safety Officer (HSO) immediately

- Any significant accident or injury requires that operations cease and the event, person, or injury be immediately addressed.
- If treatment is needed or the person(s) involved need to be transported to a medical facility, a boat with a team member and often times the HSO should be detailed for transport and assistance.
- For human safety, when conducting in-water net activities, personnel trained in emergency medical services (EMS) must be part of the on-water team including basic first aid and CPR an generally will serve as the HSO. First aid kits must be readily available.
- Depending on the situation, the decision will be made by the IC and/or CL (in consultation with the RSC or permit PI) whether to continue operations for the day.

Presence of public or bystanders

- If capture is in a public area, ensure there is sufficient crowd control and outreach.

- Ensure observing public are informed where possible/practical and ensure they stay a safe distance away from the rescue operation.

Animal safety

Environmental hazard assessment

- Use a decision matrix prior to capture to ensure risks are understood and appropriate mitigation measures are planned and accounted for by all responders.
- Prior to capture, survey the surroundings to identify any environmental hazards or predators (sharks, aggressive conspecifics) that might pose a threat to the animal.

Temperature/weather

- Prevent potential thermoregulatory stress by considering factors and managing temperature.

Minimize stress/time limits

- Responders should minimize the unavoidable stress that comes with animal capture by minimizing the duration of pursuit (if any), restraint and/or captivity, remaining calm and quiet around the animal, and minimize manipulations and transport of the animal. Have a veterinarian or veterinary technician present during operations under the permit. Minimize restraint time with priority given to documenting and removing the entangling material.
- The number of disentanglement attempts per day and consecutive days should be evaluated on a case-by-case basis, including the severity of the animal's injury and the individual animal's response to disentanglement attempts.
- If the animal is showing strong avoidance or aggressive behaviors stop all entanglement response activities and give the animal a cool-down period of (10-20 minutes) while still observing the animal's whereabouts and movements from a farther distance. If these behaviors continue after two cool-down periods reassess the entanglement response for that day.

Disturbance (other small cetaceans or wildlife)

- Consider potential effects of response to non-entangled conspecifics as well as other species within the response areas and strive to minimize disturbance as much as possible.
- Reduce all forms of disturbance to the entangled animal and any others close by (*e.g.*, if it is within a group) as much as possible by keeping noise and movement to a minimum.

Restraint devices and capturing/restraining animals

- When the animal is captured, ensure it is secured appropriately so that it is able to breathe comfortably.
- Once captured, and if not previously understood, assess where the entangling material is easiest to access and cut away. Also, make the fewest cuts needed to release the animal to reduce handling time and stress to the animal. Peel the entangling material out of the wound rather than drag or pull it from one side; this will minimize pain and lessen the chance of further injury.
- Determine whether the animal is suitable for immediate release, requires transport to rehabilitation, or

requires euthanasia, and then act as appropriate.

- Ensure transport method is safe and secure for the size and strength of the animal if being moved to rehabilitation.
- Sterilize any sampling tools that were exposed to the animal.
- Clean and dry all equipment afterwards and stow securely again ready for future use.

5.4. Team Member Roles

The capture and handling of small cetaceans has inherent risk for both the responders and the animals. Clarifying team member roles and responsibilities ahead of time, and ensuring that responders meet minimum qualifications for each role is essential for a safe and successful response. The recommended roles (see below) are based, in part, on implementation of the ICS. This system provides a structure for clarity of communications and roles, and efficient management of resources. The ICS is scalable and can be modified to fit the needs of the operation. Safety is always at the center of any plan based on ICS. The number of responders needed for a response varies widely depending on the size, strength, and location of the animal (Table 5-1).

Table 5-1. Suggested number of personnel required for a physical restraint - in water entanglement response.

Team member role	**Number of personnel required** (ranges from 20-50 depending up response)
Incident Commander	1
Capture Lead	1
Human Safety Officer/EMS Staff	1
Net Boat Operator (*i.e.*, Catcher)	1
Net Lead	1-2
Small boat operator(s)	4-6
Veterinarian/Veterinary Technician	1-2
Sample Collection Technician	1
Animal Handlers	20-30
Data Collection/Photographer	1-2

Security/Crowd control	variable
Communication Officer	1
Optional – Unmanned Aerial System Operator	1

Specific team member roles and qualifications for each role are listed below. In some circumstances, roles can be combined (*i.e.*, documentation and data collection).

- **Incident Commander (IC)** - The IC is responsible for the overall operation, including the performance of the response, and does not generally participate directly in the operation. This enables the IC to remain focused on the larger picture of the event and objectively ensure that the response is safe for participants, the public, and animals. In some small cetacean responses, the IC may be combined with the Capture Lead position.
    - **Qualifications (recommended)** – Completion of the ICS free or paid courses, and the ability to remain objective to ensure safe operations.
- **Capture Lead (CL)** - In some small cetacean responses, the IC may be combined with the CL position. The CL is responsible for all on-water activities as well as the resources needed to conduct and maintain safe and efficient operations. The CL coordinates the deployment of all vessels while searching for the target cetacean(s) as well as the positioning of vessels around the deployed net. The CL makes the final call on when and where to approach the cetacean for in- water capture attempts and when and where the Catcher sets the net. The CL strives to make the response as safe as possible for responders, animals, and the public.
    - **Qualifications** – Experience conducting in-water small cetacean capture and release activities. Experience working around small cetaceans include close approaches and vessel operations. Experience monitoring and detecting stress behavior in small cetaceans. The ability to remain objective to ensure safe operations and willingness to stop operations if there is a safety concern. Communication skills are important to the role. Ability to brief the response team beforehand, communicate w/ the various vessels on the water, and the veterinary team as needed.
- **Human Safety Officer (SO)** – The HSO is responsible for the safety of personnel involved in a response.
    - **Qualifications** – Ability to watch over all personnel involved, communicate to the IC or CL about human safety risks. Trained in emergency medical services (EMS) including basic first aid and CPR. First aid kits and other human medical gear must be readily available.

- **Net Boat Operator (Catcher)** – For in-water captures, the Net Boat Operator (Catcher), is an essential component to a successful operation, and is carefully supervised by the CL. The Catcher drives the net boat, deploys and adjusts the net (*e.g.*, seine net) used to encircle and capture small cetaceans or uses a net to close off a constrained area (*e.g.,* canal). After the CL gives permission to proceed to the Catcher to set the net, the Catcher determines precisely when to execute this directive based on water depth, conditions, presence of conspecifics, vessel traffic, and animal heading and behavior. Depending on circumstances, conditions, and number of animals, attempts may be made by the Catcher (under the direction of the CL) to maneuver the net with the boat to split, isolate or crowd animals to a particular area. The Catcher also directs the pulling, cleaning, and stacking of the net once all animals are safely restrained and secured.
    - **Qualifications** - USCG boat training or equivalent. The Catcher should be experienced with close animal approaches, capture methods, and transport of animals in the boat. Because many of these duties are outside the scope of normal boat operations, skills should be practiced prior to working with small cetaceans in or around the boat. Experience working with nets and encircling marine animals, ideally cetaceans. Experience driving vessels around cetaceans. Experience maneuvering in tight spaces, ability to remain calm under pressure.
- **Net Lead (NL)** – In some smaller responses, the CL may be combined with the NL. For in-water captures, the NL is an essential component to a successful operation. The NL is in charge of directing the capture and restraint of the animal(s) once the net is set. The NL works closely with the CL to direct the team members around the net. When animals are in the compass in shallow water, the NL will enter the water and direct other handlers on the safest means in which to secure the animal. This may involve manipulating the compass to split a group of cetaceans. If the cetacean(s) are caught in deep water, they will eventually hit the net and a vessel will respond. The vessel will keep all handlers in the boat to secure the animal against the side of the vessel. Once the animal is secured alongside the boat, the NL will work with the CL to deploy a few handlers from other boats into the water with PFDs to assist the original vessel's team in the process of transferring the animal to a floating mat for further work-up.
    - **Qualifications** - Experience conducting in-water small cetacean capture and release activities. Experience working around nets and with animals captured in nets. Experience working around small cetaceans include close approaches and vessel operations. Experience monitoring and detecting stress behavior in small cetaceans. The ability to remain objective to ensure safe operations.
- **Small Boat Operator(s)** – For in-water captures, the small boat operators are an essential component to a successful operation. The small boat operators are foremost responsible for ensuring the safety of their crew. They are also responsible for ensuring that the small boats are in the proper place while the entangled animal is followed prior to intervening, while the net is being set, and during the actual

capture. The small boat operator ensures the small boat is safely maneuvered around animal(s) and people in the water, and that the small boat is safely handled in all types of weather and sea state conditions such as currents, tides, kelp, wind, etc. Small boat operators should be experienced with animal approaches, capture methods, and transportation of animals in the boat, if needed.

  - **Qualifications** - USCG boat training or equivalent. Because many of these duties are outside the scope of normal boat operations, skills should be practiced prior to working with small cetaceans in or around the boat. Experience driving vessels around cetaceans, maneuvering in tight spaces, and ability to remain calm under pressure.

- **Veterinary Staff** – The licensed, experienced veterinarian or veterinary technician is responsible for monitoring the health of the entangled animal and any incidentally entangled or injured animals during capture operations until the animal is safely released and on its own. They are also responsible for overseeing the removal of the entanglement especially if deeply embedded.

  - **Qualifications** - A licensed Doctor of Veterinary Medicine (DVM) or equivalent, or veterinary technician who is experienced in small cetacean medicine.

- **Sample Collection Technician**– The sample collection technician is responsible for assisting the veterinarian or veterinary technician in collecting any animal samples during the entanglement response.

  - **Qualifications** - A veterinary technician or personnel trained in veterinary sample collection.

- **Animal Handlers** – The animal handlers are responsible for handling the animal to ensure it is safely restrained and all personnel around the animal are safe from potential injury such as animal bites.

  - **Qualifications** – Responders must be trained by experienced personnel in safe capture, working with animals in nets, handling, monitoring under restraint, etc. Advancement requires hands-on experience under the direct supervision of experienced response staff. This handling experience may occur in a captive display or rehabilitation hospital setting or research field setting. Handlers should also be able to remain calm under pressure, respond effectively to rapidly changing conditions, and work well in a team environment.

- **Data Collector** – The data collector is essential in recording data on all aspects of the entanglement response. This person is responsible for ensuring data sheets are complete, the animal is given an identifying number, all marks, dorsal fin features and freeze-brand numbers are recorded, roto tag and/or satellite-linked tag numbers (PTT and S/N) are recorded, and all samples are properly recorded and labeled.

  - **Qualifications** – Familiarity with data sheet and information to be recorded and ability to accurately record data legibly.

- **Photographer or Videographer** – This person is responsible for operating still or video photography to document the capture. This person may also serve as the data collector.
    - **Qualifications** – Experience using photographic equipment. Knowledge of how the equipment operates, how to change settings, troubleshoot, take clear and meaningful photos and video including dorsal fin identification pictures, and ability to post-process photos/video after the capture.
- **Security/Crowd control** – The IC should ensure that the proper authorities in the area have been notified of the response and, if possible, the area is closed to public access during the response.
    - **Qualifications** – Knowledge of proper authorities to notify.
- **Communications Officer (Optional)** – The communications officer is responsible for communicating information about entanglement response to the public and media. For high profile cases or cases conducted under the permit, messages should be coordinated with all participating organizations and cleared with NMFS.
    - **Qualifications** – Effective oral and written communicator. Ability to be clear, concise, accurate, coherent, and courteous.
- **Unmanned Aerial System Operator (UAS; Optional)** - If permitted to operate a UAS during the capture, the UAS pilot must have no other duties. The pilot should be in communication with the IC and immediately cease operation if the UAS is in any way negatively impacting the success of the capture or causing disturbance to the target or other animals.
    - **Qualifications** – A certified pilot's license, a permit to operate during a capture, follow all existing FAA and other regulations, and experience operating a UAS during previous small cetacean field operations.

5.5. Environmental Conditions

Create a risk assessment tool (Appendix F – Risk Factor Table) or decision matrix (Appendix G – Decision Matrix (Go/No Go) to determine whether an entanglement response is safe for responders and small cetaceans based on environmental conditions. Assess the following environmental conditions prior to small cetacean in-water capture:

- Weather conditions (*i.e.*, rain, snow, fog, visibility, wind, sea state, approaching storm systems, lightning in the area, heat, cold).
- Submerged (*i.e.*, sand bars, rocks, oyster bars, coral reefs, sunken debris, etc.) and emergent (pilings, docks, jetties, etc.) hazards.
- Location of the animal in relation to the surf zone or shallow water.

- Tide (*i.e.*, incoming or outgoing tide, tidal amplitude, increased surf, currents)
- Time of day (*i.e.*, close to sunset).
- Conspecifics (*e.g.*, other animals of the same species in the area) and other wildlife that could impact operations (*e.g.*, manatees, sea turtles).
- Predators (*e.g.*, sharks, alligators, killer whales, etc.) and other hazardous wildlife (*e.g.*, stingrays, jellyfish, etc.),

5.6. Equipment

Data supplies

- Capture/handling forms (*i.e.*, Level A, Human Interaction, Capture form, Respiration form, Priority samples list, etc.)
- Pencils/clipboard
- Watch with timer
- Camera and/or video camera (*e.g.*, GoPro)

Sampling, tagging, and marking supplies

- Measuring kit (*e.g.*, tape measure, calipers, ruler)
- Tagging and marking kit (*e.g.*, fin notcher, plastic fin tags, satellite-linked tags, tagging equipment, freeze-branding equipment, markers, dorsal fin board)
- Sampling kit (*e.g.*, cryovials for skin, blood tubes, swabs)

Protective clothing

- Footwear appropriate for vessels and footwear appropriate for entering the water and moving about.
- Protective clothing (*e.g.*, PFD, raingear, etc.)
- Optional - eyewear, masks, etc.

Human medical equipment

- First aid kit (optional AED)
- Additional medical equipment if EMS personnel present

Animal medical equipment

- Disentanglement instruments (*e.g.*, hand-held cutting tools, knife, scalpel, wire cutters, hemostats, etc.)
- Wound care kit
- Medications [*e.g.,* emergency medications (crash kit), antibiotics, euthanasia solution, etc.]

Capture and restraining gear

Equipment used for physical restraint of small cetaceans in water varies by species and location. Equipment may include, but is not limited to: 1) seine net, 2) hand nets or net panels, 3) hoop nets, 4) floating mats, and 5) small boat transport. Capture techniques are described in detail in Asper (1975) and Loughlin *et al.* (2010).

Seine net (*below; reviewed in Barratclough et al. 2019*) – The standard approach to capture small (1– 5) numbers of small cetaceans in shallow waters is by encirclement with a seine net up to ~500 meters long and ~7 meters deep. The seine net is typically deployed from a specially designed boat at high speed around the target animal(s), creating a compass, with well-trained handlers distributed around the circumference (in shallow water only) to provide support and restraint when the cetacean(s) contact the net.

Figure 5-1 from Barratclough et al. 2019 - Capture methodology with (A) seine net deployed from a specially designed boat creating a compass in the center of the image, with chase boats circling outside to help contain the animals before completion of the compass and to deliver handlers to the net (two dolphins are visible inside the compass on the left side). (B) Shallow water set, well-trained handlers distributed around the circumference of the compass to provide aid and restraint when the dolphins contact the net. All photos taken under NMFS MMPA/EAS permit No. 18786-03.

Hand net/net panels – A hand net or net panels can be used in certain circumstances when a dolphin is in a small area that can be cordoned off with a net (*e.g.,* a canal). In this process, the net is either pulled by a boat or by hand across the canal opening. The dolphin is herded toward the shallows and caught by handlers similar to the purse seine technique above.

Breakaway Hoop Nets –A hoop net made from aluminum rod, tubing, and a soft knotless net is placed in front of the animal as it surfaces, with the animals' forward movement in combination with the net handler's skills the animal is captured in the net. The net releases from the frame leaving the animal in the tethered net. The animal can still swim, surface, and breathe during this process.

Soft Tail Line - This method has been used with killer whales. The soft tail line would be placed around the peduncle of the animal and the animal would then be guided into the stretcher, potentially with divers in the water, and secured next to the capture vessel.

Floating Mat – If capture occurs in deep water (greater than 1.5 meters), the animal can be handled from the side of response vessels and moved onto specially designed floating mats that are either towed to shallow water, directly to a processing vessel, or alongside the responding vessel for examination, disentanglement, and possibly sample collection. Standard mats can float an animal and 3-6 persons.

Figure 5-2 from Barratclough et al. 2019 - Capture methodology with (C) Deep water set, dolphin is placed onto a floating mat and disentangled from the net for transport to the processing vessel. All photos taken under NMFS MMPA/EAS permit No. 18786-03.

Small Boat Transport – Small boats including rigid hull inflatable boats, inflatables, net skiffs with removable transoms, and whalers/skiffs are useful in transporting animals. In the boat, animals should be transported on a closed-foam mat, shaded, and wetted down throughout the transport.

Cleaning/disinfecting supplies

- Antibacterial soap/hand sanitizer
- Disinfectant solution (*e.g.,* chlorhexidine, 70% ethanol, etc.)
- Spray bottle for disinfectant solution
- Garbage bag(s) or other container(s) to separate gear and clothing

Miscellaneous supplies

- Cooler/waterproof case/Backpack (to carry supplies)
- Bucket (to carry supplies and/or to hold water to cool animals)

5.7. Data Collection

It is important that supply checklists and data needs are well thought out prior to the start of any entanglement response program and data forms and instructions are accessible during a response. Important forms to have on hand could include: applicable permits, Level A and Human Interaction Forms (Appendix B – Level A and Human Interaction Form), gear checklists (Appendix C - Gear Checklist), and disentanglement forms (Appendix D – Disentanglement form), respiration rate form (*e.g.,* Appendix E - Respiration rate form), and priority sample sheet (will vary with each response). All entangling gear should be retained (if possible), documented on the Level A and Human Interaction Form, and stored in a centralized location or sent to a gear repository for analysis, please consult with the RSC on appropriate repositories by region.

5.8. Risks and Mitigation

To minimize risk to human responders, animals, and, in some cases, the general public, a comprehensive entanglement response safety plan should be implemented. A safety briefing should occur prior to each entanglement response. In addition, a decision matrix or Go/No Go criteria should be established to guide responders in making safe decisions regarding the response to entangled small cetaceans. Responders should prepare, plan, and practice for possible risks and identify mitigation measures prior to any response. After each response, the team should conduct a thorough de-brief and come up with lessons learned that can be applied to future responses. When responding to entangled small cetaceans, the list of risks and mitigations is never complete. There is always room for improvement and documents should be regularly assessed and updated when necessary.

RISKS TO HUMANS

Risk: *Injury or death to personnel by drowning, falling, blunt force trauma, entrapment, or stepping on hazards.*

***Mitigation*:**

- Responders should wear appropriate PPE such as strong, non-slip, close-toed footwear, PFDs, and other protective clothing as necessary.
- Designated HSO should be assigned to watch over all personnel involved and be able to communicate to the IC or CL about human safety risks.

Risk: *Injury to personnel from nets.*

***Mitigation*:**

- Animal handlers should wear appropriate PPE such as strong, non-slip, close-toed footwear, and PFDs and other protective clothing as necessary.
- Handlers should be trained in techniques that minimize the chance of injury to themselves and others during in-water capture including instruction on avoidance of entanglement in netting. Potentially entangling jewelry (*e.g.,* rings, earrings, piercings) should be removed before participating in the operation.
- All nets should be inspected prior to reuse and for entangled animals during operations (*e.g.*, stingrays, sharks).

Risk: *Injury to personnel from cetacean bites or strikes from heads or tails.*

***Mitigation*:**

- Personnel should wear appropriate PPE such as strong, non-slip close-toed footwear, protective clothing, and PFDs.
- Personnel should be aware of animal induced injuries from being hit by a rostrum, fin, tail, or other body part. Never try to restrain a small cetacean alone, always restrain animals in concert with at least 3-4 persons and with additional handlers available nearby to assist with restraint.

RISKS TO ANIMALS

Risk: *Injury to an animal from nets.*

***Mitigation*:**

- Personnel should be trained in techniques that minimize injury to the animal.
- Use an adequate number of personnel to increase safety, including trained personnel and vessels to respond to both deep-water and shallow-water sets.
- Emergency medications (*e.g.,* euthanasia solutions, and treatment drugs), treatment, and resuscitation equipment should be available for each capture response.
- Have a veterinarian or veterinary technician present during operations under the permit.
- Medical care capacity (*e.g.,* rehabilitation) should be evaluated and arranged for well prior to capture.

Risk: *Unintentional capture, vessel strike, or disturbance of non-entangled animals.*

***Mitigation*:**

- Evaluate the possibility of unintentional take of non-target animals before and during capture.
- Complete appropriate “take” (capture, and/or harassment of any marine mammal; or, the attempt at such) approval and documentation to disturb non-target animals.

- Always consider efforts to minimize disturbance to non-entangled animals.
- Designated personnel should continuously watch for the presence of non-entangled protected species in and around the capture area, and communicate with the CL appropriately.

Risk: *Animal fatality.*

***Mitigation*:**

- Personnel should be trained in techniques that minimize injury to an animal.
- Capture should not be attempted if the environment, equipment, or personnel are not adequate for the response.
- Have a veterinarian or veterinary technician present during operations under the permit.
- NMFS must be notified immediately. The animal should be recovered, a full necropsy performed, and a final report sent to NMFS.
- Entanglement response activities should immediately cease and the permit holder should be notified immediately. Small cetacean entanglement response activities under the permit cannot resume after a fatality until a necropsy is completed and new mitigation measures are approved by NMFS.

5.9. Intervention Criteria/Decision Matrix (Go/No Go)

A risk intervention tool (Appendix F – Risk Factor Table) or decision matrix (Appendix G – Decision Matrix (Go/No Go) should always be consulted prior to any response by the command staff and/or full team, depending upon size of the response. For an in-water physical capture and restraint response, factors that should be considered include environmental, team selection and fitness, small cetacean condition, permission, resources, and mission complexity. Additionally, a specific Decision/Process Matrix for In-Water Capture is below.

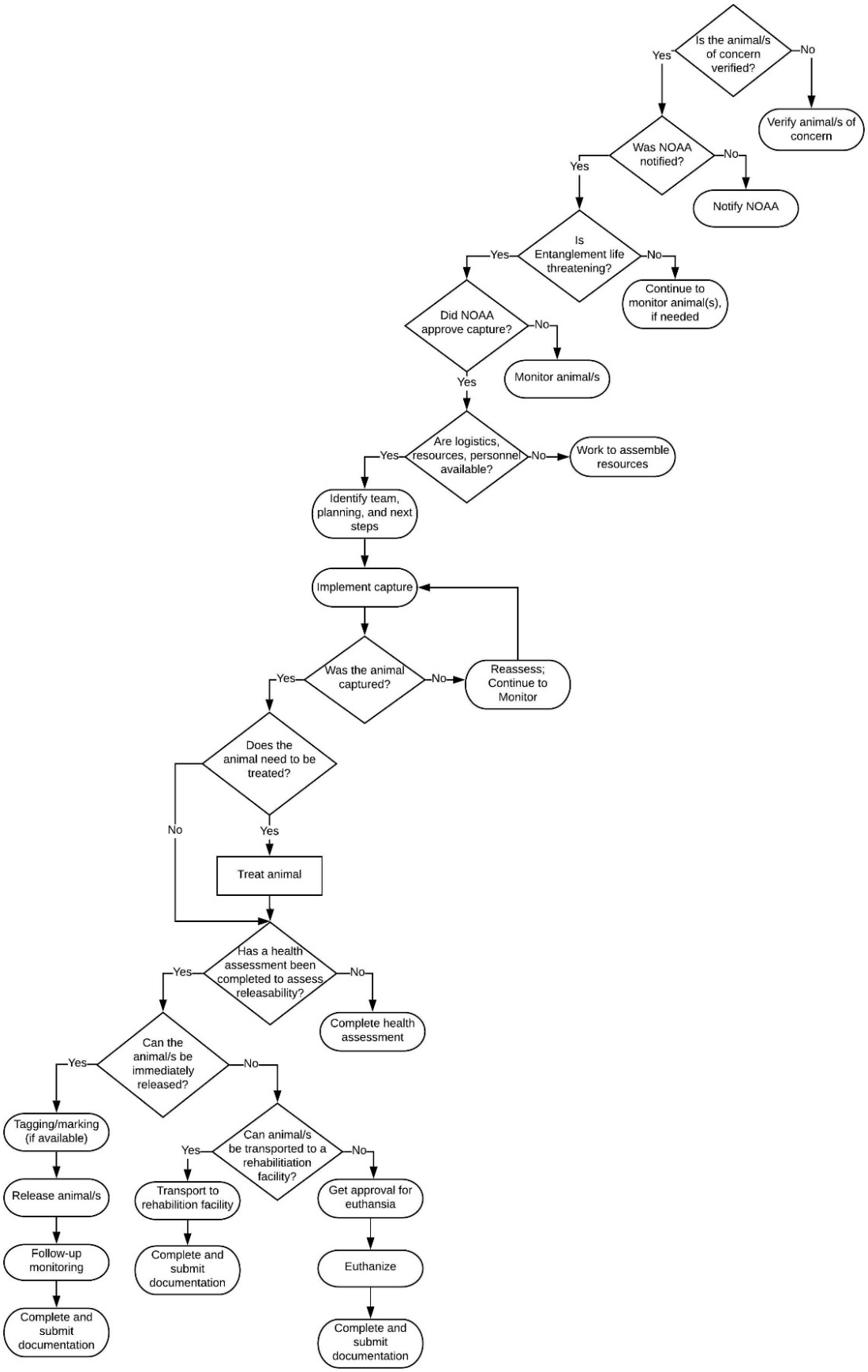

Figure 5-1: Decision/Process Matrix for In-Water Capture

5.10. Procedure

Optimal capture situation

- Solitary
- Milling or traveling slowly
- Easily relocated/resident animal
- Located in shallow water
- Clear, calm water
- Minimal currents
- Seafloor free of obstructions
- Other environmental conditions favorable

Animal capture and restraint

1) **Risk assessment tool or Go/No Go determination:** Consult to determine if a safe capture is feasible. Criteria will be based on authorization requirements and decision matrices.

2) **Assign team roles and review capture plan (this should be done prior to leaving the dock and again on each individual vessel):** Before handling any animal, be sure everything is ready. Double-check all the equipment and supplies. Identify the IC and CL, review the capture scenario and all procedures, any emergency response, and the sequence of the activities. Discuss when a capture should be aborted and who makes the decision. Assign roles for each team member (and backups) for every part of the capture, and confirm team members fully understand, are capable, and are mentally prepared. Review animal warning signs and the appropriate emergency response actions. The IC and CL should ensure all personnel and equipment are ready and perform the final Go/No Go determination.

3) **Locate and identify candidate animal:** The entangled animal should be identified, and its position, size, age, and sex (if possible to determine), and placement among other animals noted.

4) **Secure the area:** If necessary, onlookers should be notified and asked to clear the area.

5) **Modify protective clothing to minimize being caught in a net during a handling event:** Remove all jewelry including watches, rings, earrings, and piercings, tie hair back, check clothing for buttons (even pant cuffs), check foot coverings for potentially entangling buckles, snaps, or straps, and modify as appropriate to reduce entanglement/tripping risks.

6) **Documentation:** The data recorder and the photographer should ensure all photo and video equipment is on and recording.

7) **Time limits:** Record the time of day, record each time the net is set, record time animal hits the net, record time when animal is first under restraint, record release time, and total capture and restraint time (from when the animal is first touched until released).

8) **Approach:** The team should get into position, approach, and capture the entangled animal.

9) **Capture**:

   a) **Purse Seine Net -**The standard approach to capture small (1–2) numbers of small cetaceans in shallow waters is by encirclement with a seine net up to ~500 meters long and ~7 meters deep. Shallow water (less than 1.5 meters) where handlers can safely stand, minimal currents, and a solid seafloor are optimum for safe capture and restraint. The seine net typically is deployed from a specially designed boat at high speed around the target animal(s), creating a compass, with well-trained handlers distributed around the circumference to provide support and restraint when the animals contact the net. If capture occurs in deep water (greater than ~1.5 meters), the net compass, with the animals swimming inside, can be pulled into nearby shallow water, or the animals can be handled from the side of response vessels and moved onto specially designed floating mats that can in turn be towed to shallow water, directly to a processing vessel, or alongside a response vessel for examination, disentanglement, and sample collection (if conditions allow).

   b) **Hand Net/Net Panels -** A hand net or net panels can be used in certain circumstances when a dolphin is in a confined area that can be cordoned off with a net (*e.g.*, a canal). In this process, the net is either pulled by a boat or by hand across the canal opening. The dolphin can then be moved to the selected capture location or handled in place (if it hits soon after the net is set).

   c) **Breakaway Hoop Nets** – For use on free-swimming animals. A hoop net made from aluminum rod, tubing, and a soft knotless net is placed in front of the animal as it surfaces, with the animals' forward movement in combination with the net handler's skills the animal is captured in the net. The tethered net releases from the frame leaving the animal in the net. A nylon tether line is secured to the capture vessel in advance, which can be used to pull the animal towards the capture vessel, where it can be maneuvered by handlers into a stretcher. The animal can still swim, surface, and breathe during this process.

   d) **Soft Tail Line -** Primarily used if the animal is accessible at the surface, such as a lethargic or logging animal, but it can also be used in combination with the hoop net. This method has been used with killer whales. The soft tail line would be placed around the peduncle of the animal and the animal would then be guided into a stretcher, potentially with divers in the water, and secured next to the capture vessel.

10) **Floating Mat** – If capture occurs in deep water (greater than ~1.5 meters), small cetaceans can be handled

from the side of a response vessel and moved onto specially designed floating mats that are either towed to shallow water or directly to a processing vessel for examination and sample collection. Standard mats can float an animal and 3-6 persons.

11) **Restraint:** Once the animal has been captured and brought to shallow water (if applicable) or brought onto a mat, the entangling material should be photo-documented and removed. Confirm that the handlers have control of the animal before conducting any procedures. Controlling the animal's head and tail is the most critical part of the restraint. When sampling, tagging, etc., the person performing these activities quietly states what procedure is next so the restrainers can prepare for the animal's potential reaction.

    a) Small boat transport: Small boats such as rigid hull inflatable boats (RhIBs), inflatables, net skiffs with removable transoms, and whalers are useful in transporting animals if the animal needs to be taken into rehabilitation. Inside the boat, the animal should be placed on foam on a shaded deck, supported by 3-4 handlers, and kept wet, using buckets and sponges, wet towels, or sprayers.

    b) With any transport, one person, usually the veterinarian or veterinary technician, should devote their attention to the animal and monitor it constantly. If an animal cannot be lifted into a boat, it may be necessary to rig it so that it can be safely towed slowly behind or alongside with the animal contained within a net or stretcher in the water.

12) **Monitoring and assessment:** The animal should be immediately assessed for signs of respiratory or circulatory distress and treated accordingly. Ensure the animal's blowhole is free from any obstructions and that the animal can breathe normally. The use of a Respiration Rate Data Sheet is useful to keep an objective record of frequency and quality of respirations. For most captures, a veterinarian or veterinary technician and the front handlers will be responsible for monitoring the animal's level of alertness, heart rate, and respirations throughout the restraint period. It is important to make sure that chest expansion is occurring with each breath. The entire team should be notified if the animal's vitals start to change. The animal's breathing pattern may be somewhat irregular, and it may breath-hold, so vigilance is key. Either a sudden change in breathing pattern (whether an increase or decrease), or a decrease in responsiveness to stimuli raises concern. Check the animal's eyes to see if they are responsive (*i.e.*, is the animal looking around, does it respond to stimuli). Tap its head gently behind the eye with your finger. Check the jaw tone by opening the mouth. Vocalizations by the animal are typically a good sign. If it does not show some response or its response is slow and the animal does not appear to be attentive, remove the entanglement (if not already completed), abandon all other sampling, stimulate the animal, release the animal, and monitor it. When feasible, the animal should be tagged prior to release, to facilitate post-release monitoring, if this can be done without compromising its well-being. Responders should be conservative in decision-making and err on the side of caution.

13) **Data collection:** Morphometrics (at least total straight-line length and maximum girth), sex, and if appropriate, samples, should be taken and all data recorded completely on Level A and Human Interaction Forms, and any other necessary capture forms.

14) **Disentanglement:** The entangling material should be removed using an appropriate cutting tool (*e.g.,* knife, scalpel, wire cutters, etc.) by peeling the material out of the wound, rather than dragging it out from one side, to minimize pain and prevent further injury. All entangling gear should be retained (if possible), documented, and archived.

15) **Wound care:** The wound (if any) should be assessed to determine the extent of tissue damage and to ensure all foreign material has been removed. The wound may be cleaned with antiseptic and treated topically, though this should be balanced against animal handling time and stress. Many entanglement wounds are open and will be easily flushed with seawater, making wound care less critical. However, if needed, responders can do wound debridement or administer antibiotics. A broad-spectrum, long-acting antibiotic can be used to treat injuries, but the choice to administer this (or other drugs) is at veterinary discretion. Dilute povidone-iodine or chlorhexidine may be used to flush deep wounds or areas not likely to be easily flushed on their own. Euthanasia solutions should be kept on hand in case there is a need for euthanasia. In the case of a severe wound, and if the animal is small enough to transport to a rehabilitation center, surgery may be considered.

16) **Marking and tagging:** Temporary (*e.g.*, paint stick, zinc oxide) or longer-term markings (*e.g.*, trailing edge dorsal fin notching, freeze-brands), or tags (*e.g.*, dorsal fin mounted roto tag, radio, or satellite-linked tag) can be applied for more visible and long-term identification as well as post-release follow-up (Wells *et al.* 2018).

17) **Releasing the animal:** Confirm that the animal has a clear means of exit. The CL or other designated person will direct the release. All handlers should release the animal at the same time usually after a countdown. If conditions allow, monitor the animal post-release from a distance for ~15 minutes, while keeping a low profile. Ideally, additional post-entanglement monitoring and photo-documentation of the animal should be conducted over the next days to weeks to determine if further intervention is warranted, to identify possible complications from the intervention, or to confirm the success of the operation (Wells *et al*. 2013).

18) **Post-capture debrief:** The entire team discusses the capture, gives constructive feedback, and brainstorms on areas that need improvement. It is important to discuss as a team within 24 hours of the capture while memories of the event are fresh. Debrief notes should be added to the final report.

19) **Disinfecting/disposal:** If protective reusable clothing (*e.g.*, wetsuits, footwear) are soiled, they must be

cleaned and disinfected before reuse. All contaminated reusable equipment and gear must be cleaned and disinfected including restraining nets, measuring gear (*e.g.*, tape measure and scales), tagging supplies (*e.g.*, tagging pliers/hole punches, etc.), specimen supplies, and other miscellaneous items (*e.g.*, buckets, clipboards, writing implements, etc.). Dispose of used non-permeable gloves in the trash. Place used needles/scalpels in a "SHARPS" container (do not recap needles).

20) **Submit reports:** Ensure all datasheets, reports are complete, and submitted where appropriate.

21) **Prepare again:** Clean and organize gear so that it is ready for future use.

6 Gaps and Future Research Needs

6.1. Training and Sharing of Protocols

One of the biggest gaps in the ability to respond to entangled small cetaceans is the lack of quick response to entangled animals. In many regions, lack of personnel in remote areas prevents immediate assessment of entangled individuals. There is a need to build network capacity in both remote and in- water scenarios, especially for responses to species in addition to bottlenose dolphins. There is also an ongoing and essential need to identify and train more net boat operators and persons for the CL role for in-water captures. Even if groups do not routinely use in-water, vessel-based capture techniques, or seine nets, they should be included as part of regular training exercises or hands-on training opportunities. Additionally development by NMFS of system to track training and responder qualifications would be useful. Responders that have developed effective protocols should share these with other small cetacean entanglement response groups.

6.2. Equipment Needs/Tool & Technique Development

As techniques and protocols improve, these should be shared with network members via the MMHSRP and RSCs. NMFS should encourage formal training in both remote and in-water techniques. There is a need to improve and refine remote cutting tools available for response to small cetacean entanglements. Teams working with small cetaceans could work with existing large whale teams to scale down some of the most effective remote tools used in large whale entanglement responses. Certain regions may want to invest is caching appropriate remote and in-water capture tools and equipment depending upon need.

6.3. Future Directions

One specific area to develop includes adapting existing remote sedation techniques used for pinniped and large whale entanglement responses for use in small cetaceans. This could include development and testing of appropriate drug combinations on surrogate or managed care species, as well as remote sedation hands-on training through wildlife capture courses and cross training of responders across taxa. Annual or biennial darting and sedation classes, including the proper methods to load darts, the best sedation methods, and lessons learned would be beneficial to all responders. Continued research into effective sedation protocols for different species and methods for best practice should be encouraged including collaborating with the global marine mammal community. Once remote sedation techniques are developed and validated for use in small cetacean, we would update the Best Practices to reflect this new technique.

In addition, several groups are working on new technologies and methods to remotely attach single- pin satellite-linked tags to free-swimming small cetaceans. Once this technology is developed, we would update the Best Practices to include using remote tags for monitoring small cetaceans prior to or after being disentangled.

6.4. Lessons Learned

Included below are lessons learned from entanglement response personnel:

- Safety of personnel is the top priority with the safety of the animal second.
- Be prepared, PRACTICE regularly to be ready for a response, and have an experienced team that works well together.
- Establish methods for clear communication prior to a capture event. Ensure all participants understand how communications will be conducted.
- The option to stand down should always be considered if conditions for humans or animals deteriorate.
- Always conduct a team debrief (in-person or virtually) shortly after each capture to discuss what went well and where improvements could be made.
- Never stop striving to improve safety and handling protocols. Share lessons learned with other teams nationally and internationally.

6.5. Outreach and Education

All NMFS stranding networks in the United States provide stranding hotline numbers to report entangled or injured marine mammals (see https://www.fisheries.noaa.gov/report). It is important to get this information out to all regions of the country so entangled small cetaceans can be reported, documented, and, ultimately, ideally helped.

NMFS and network members should continue outreach and education and work together with the public, industry, and stakeholders to mitigate the problem of entangling fishing gear and debris in the ocean. For more information about how we can all help reduce the amount of marine debris that enters the environment, see https://marinedebris.noaa.gov/.

There are many opportunities to get involved in primary and secondary schools. NOAA has a very successful Ocean Guardian School Program. An Ocean Guardian School makes a commitment to the protection and conservation of its local watersheds, the world's oceans, and special ocean areas, such as National Marine Sanctuaries. The school makes this commitment by proposing and then implementing a school- or community-based conservation project. Project pathways include: 1) Restoration; 2) Rethink/Refuse/Reduce/Reuse/Rot/Recycle; 3) Reducing marine debris and single-use plastics; 4) Creating schoolyard habitats or gardens using native plants and reducing water use; and 5) Energy and ocean health. As part of this program, the schools produce measurable data so progress can be tracked.

7 Conclusion

There have been many advances in small cetacean entanglement response in the last several years. However, our ability to disentangle animals is small compared to the large problem of fishing gear, plastics, and marine debris in the oceans that threaten all marine life. It is important to collectively work together to find solutions to prevent fishing gear and marine debris from entering our waterways. By educating through outreach and working together on prevention, we can help to mitigate the impacts of fishing gear and marine debris on small cetaceans and all marine species, while still responding to entanglements when necessary. Ultimately, however, prevention is the key to solving this global problem.

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10 Appendices

Appendix A – Example Frequently Asked Questions

Q: What are small cetaceans?

A: Small cetaceans include the toothed species of whales, dolphins, and porpoises, excluding sperm whales. Small cetaceans live their entire lives in the water and use sound both for communication and to hunt for food. All small cetaceans are protected under the Marine Mammal Protection Act (MMPA) while some are also listed under the Endangered Species Act. Under the MMPA, NOAA Fisheries has jurisdiction over all small cetaceans.

Q: How do marine mammals become entangled?

A: Marine animals, like whales, dolphins, seals, and sea lions, can become entangled in fishing gear that is being used to fish either commercially or recreationally, lost or abandoned gear, and other types of rope/line and trash, including plastic bags, that find their way into their natural environment.

Q: What is a small cetacean entanglement?

A: Common examples of items that may entangle small cetaceans include fishing gear, including recreational and commercial gear, rope, and other types of debris. Small cetaceans commonly become entangled around their tail flukes, flippers, dorsal fin, or head. Small cetaceans can also ingest fishing line, hooks, and lures. Entanglement in and ingestion of marine debris and fishing gear can cause decreased swimming ability, disruption in feeding, life-threatening injuries, infection, and death.

Q: Can small cetaceans become seriously injured when entangled?

A: Entanglements have been identified as a significant cause of injury or mortality to small cetaceans throughout the world. Entangling materials may cause lacerations, amputation of appendages, infection, may impact the ability to catch their food, and may result in death (*e.g.*, drowning, strangulation, etc.) and/or death of dependent calves. Common examples of entangling gear that harm small cetaceans include active or derelict fishing gear, rope, and other debris (Wells *et al.* 2008, Barco *et al.* 2010, Stolen *et al.* 2013, Adimey *et al.* 2014). Small cetaceans can also ingest fishing line, hooks, and lures leading to injury and death (Barros *et al.* 1990, Gorzelany 1998, Baulch and Perry 2014, McLellan *et al.* 2015).

Q: What is a life-threatening entanglement?

A: The threat of entanglement to small cetaceans is typically not immediately life-threatening, and there is time for qualified experts to respond to and assess an entangled small cetacean and possibly cut the animal free. However, a life-threatening entanglement includes any material that impacts the ability of the small cetacean to swim, breath, or feed, or that may cause severe internal injury (*e.g.*, swallowed hooks still connected to line and/or lure protruding from the mouth; *e.g.*, see pp 34-35 NMFS Serious Injury Procedure for details).

Q: How does NOAA Fisheries respond to small cetaceans entanglements?

A: NOAA Fisheries works with highly skilled experts nationally to establish a Stranding Network of trained response teams. NOAA Fisheries also maintains regional marine mammal stranding reporting hotlines that allow reports of entangled and injured free-swimming small cetaceans to quickly be relayed to the appropriate responders. Responding (as appropriate, feasible, and safe) entanglements is extremely difficult, dangerous, and should only be attempted by professionally trained teams. Availability of teams for response to free-swimming small cetaceans may be limited in some geographic areas.

Q: Who should people contact if they encounter an entangled small cetacean and what can they do? Who is responsible for disentangling the small cetacean?

A: Immediately contact your local Stranding Network, local authorities, or the NOAA Fisheries 24-hour Stranding Hotline to report an entangled free-swimming small cetacean:

- For the Southeast Region, call 877-WHALE HELP (877-942-5343).
- For the Northeast Region, call (866) 755-6622
- For the West Coast Region, call (866) 767-6114
- For the Alaska Region, call (877) 925-7773
- For the Pacific Islands Region, call (888) 256-9840

Members of the public should NOT attempt to disentangle small cetaceans themselves and should instead immediately call authorized professional responders. Only responders who have been authorized by NOAA Fisheries and who have the training, experience, equipment, and support needed should attempt to disentangle marine mammals. Entanglement response efforts also rely on the support of many state and federal agencies (including law enforcement agencies and the United

States Coast Guard), non-governmental organizations, and others working together to respond to, and ultimately prevent, entanglements.

The NOAA Fisheries Office of Protected Resources coordinates marine mammal entanglement response efforts around the country through the National Marine Mammal Health and Stranding Response Program.

Regardless of the species, disentangling marine mammals is dangerous, and should only be performed by trained professionals. **Only trained and authorized responders should attempt to disentangle or closely approach an entangled small cetacean.** Small cetaceans are unpredictable and attempting to remove an entanglement can be dangerous.

Here are the steps to follow:

- Stay in the boat—***never get in the water*** to attempt to help an entangled small cetacean.
- Note the GPS coordinates of the location of the entangled animal and direction of travel.
- Call your local responder via the national entanglement response and Stranding Network.
- Wait for trained, authorized personnel—do not attempt to free an animal on your own.
- Monitor the situation—if a response is possible, authorities may ask that you stand by and watch the animal from a safe distance (greater than 100 yards and not directly behind the animal).
- Document the entanglement—if possible take photos and video of the animal from a safe and legal distance (*e.g.*, 100 yards). This can provide valuable information to Stranding Network responders. Note presence, color and markings on any buoys or other gear on the small cetacean.
- Do not touch the marine mammal.
- Don't allow pets to approach the cetacean.

Q: When and how does the Stranding Network disentangle small cetaceans?

A: Disentanglement attempts are reserved for situations that are determined to be life-threatening to the animal, in areas that are safe for the Stranding Network to work, areas where there are trained and experienced responders, and situations where animals are individually identifiable and likely to be re-sighted. For entangled small cetaceans, NOAA Fisheries, in consultation with experts and veterinarians, will determine if an entanglement is considered life-threatening. This is achieved through field observations by responders, biologists, researchers, and veterinarians, analysis of

photos and/or videos, the animal's behavior and appearance, and prior experience with similar entanglements (*e.g.*, Wells *et al.* 2013).

If the entanglement is determined to be life-threatening, the next step is to determine the most appropriate method of intervention. For example, in some cases Stranding Network members can capture an animal in the water and remove the entanglement. However, in-water captures are difficult, complicated, and can lead to both injury and death of the small cetacean as well as injury to responders. Therefore, in-water captures are not always possible or the best course of action. Additionally, depending on the species, severity of the injury, and circumstances, the animal may need to be evaluated and treated at a permitted rehabilitation facility. If intervention is not an option or the entanglement is not considered life-threatening, the animal may be monitored, usually by local researchers, Stranding Network partners, or trained biologists, to determine whether an intervention may be possible at a later date (*e.g.*, the animal moves to a more suitable area for rescue, the animal live strands, the animal becomes lethargic and more approachable, the weather improves, the animal's condition deteriorates (if the entanglement was not originally considered life-threatening).

Q: How do you respond to an entangled, free-swimming small cetacean using remote disentanglement techniques?

A: Only trained and authorized responders should respond to an entangled free-swimming small cetacean. Remote disentanglement techniques usually involve one to two vessels and several close approaches to the entangled small cetacean using remote disentanglement tools (*e.g.*, cutting pole, cutting grapples) to cut the entangling gear/debris while still being at some distance from the animal. The animal is not captured during a remote disentanglement. For remote responses, factors that should be considered include environmental conditions, team selection and training, condition of the animal, type of entanglement and location on the body, resources, and mission complexity. Whenever possible entangling gear should be retained, documented, archived, or sent to a gear repository for analysis. Please consult with the Regional Stranding Coordinator on appropriate repositories by region.

Q: How do you respond to an entangled, anchored small cetacean using remote disentanglement techniques?

A: Only trained authorized responders should respond to an entangled anchored small cetacean. Remote disentanglement response techniques for anchored small cetaceans usually involve one to two vessels and close approaches to the entangled and anchored small cetacean, either using remote

disentanglement tools to cut the entangling line or by briefly restraining the small cetacean alongside the vessel and disentangling by hand. Occasionally anchored animals may be in shallow water, and an in-water response may be possible if handlers are able to stand and disentangle the small cetacean safely. The remote disentanglement of small cetaceans that are anchored has inherent risk for both the responders and the animals. Anchored animals generally need to be responded to within < 24 hours; consequently, there will be less time for planning and preparation and increased risks to the animal of drowning and death.

Q: How do you respond to an entangled, free-swimming small cetacean with an in-water capture and restraint response?

A: Only trained and authorized responders should respond to an entangled free-swimming small cetacean. In-water captures are difficult, complicated, and can lead to both injury and death of the small cetacean as well as injury to responders. For an in-water physical capture and restraint response, factors that should be considered include environmental, team selection and training, condition of the animal, type of entanglement and location on the body, resources, and mission complexity. The location of the animal will help determine which capture equipment to use which can include purse seines, hand nets or net panels, breakaway hoop nets, or soft lines.

Q: What are the risks to the Stranding Network members during a disentanglement?

A: Small cetaceans are powerful wild animals that can pose risks to human health and safety. Stranding Network members may be exposed to diseases that can be transmitted from small cetaceans to humans, may sustain injuries or bite wounds, and usually conduct work in small vessels in variable weather conditions. There are different techniques to disentangle small cetaceans to reduce these risks including using remote tools to cut away the entanglement and catching individuals using nets so that they can be more safely approached and disentangled.

Q: Do the marine animals know that you are trying to help them?

A: Certainly, they are aware of a rescue team's presence but just what they think of response activities is unclear. As with any wild animal, they may be very dangerous when injured and under stress. While working closely with a marine mammal, rescue teams make every effort to keep themselves safe. Animals may react with fight or flight responses and may use their heads, flukes, or flippers to defend themselves.

Q: What is NOAA Fisheries doing to prevent future entanglements?

A: NOAA Fisheries continues to work with numerous partners to reduce marine debris and to minimize or prevent entanglements. Each successful disentanglement provides information to guide gear modifications and management strategies to further reduce threats.

Q: What can people do to help prevent the entanglement of marine animals?

A: When fishing or boating, do not leave fishing gear or trash behind. Also, consider participating in community clean-up efforts. Whether at the beach, river, or local park, trash can often find its way into the ocean and present an entanglement risk. And always remember to "lose the loop" - cut any loop before properly discarding it in the trash so that it does not become an entanglement hazard.

Q: Why is documentation of small cetacean entanglements important?

A: Without documentation, little can be learned about entanglements and how to prevent them. By understanding how, where, when, and which small cetaceans get entangled, we may be able to make better decisions regarding prevention, which is the ultimate solution to the problem. The primary focus of entanglements should be in prevention and it is difficult to prevent the problem if we do not fully understand it. Documentation helps quantify entanglement incidence and prevalence, which helps us understand the overall impact on small cetacean populations. When we know the main sources of entanglement, we can prioritize the best methods to solve the problem. For small cetaceans entangled in active fishing gear, we need to find effective deterrents to reduce interactions. For small cetaceans entangled in marine debris and lost and abandoned fishing gear, we need to provide more outreach and education while encouraging prevention. Documentation also can help show if the disentanglement has been successful or not and creates an understanding of the healing process.

Q: Do you analyze the gear collected from a disentanglement?

A: When disentangling, a secondary goal for the Stranding Network is to document and recover the entangling gear. Recovered entangling gear may be sent to NOAA Fisheries gear experts for identifying type of material, configurations, and specific fishery if possible. It may be provided to the NOAA Office of Law Enforcement if the gear is considered non-compliant with regional or seasonal fishery restrictions.

Appendix B – Level A and Human Interaction Form

Level A forms, Human Interaction forms, and a complete and detailed examiners guide can be found online at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/level-data-collection-marine-mammal-stranding-events.

MARINE MAMMAL STRANDING REPORT - LEVEL A DATA

FIELD #:_____ **NMFS REGIONAL #**:_____ **NATIONAL DATABASE#**: _____
(NMFS USE) (NMFS USE)

COMMON NAME:_____ **GENUS**:_____ **SPECIES**: _____

EXAMINER Name:_____ Affiliation: _____

Address:_____ Phone: _____

Stranding Agreement or Authority: _____

Report Type: ☐ Stranded ☐ Live entangled, in-water **CONFIDENCE CODE** (Check ONE): ☐ Unconfirmed Public Report ☐ Confirmed Public Report ☐ Confirmed by Network

INITIAL OBSERVATION

☐ Same Information for Level A Examination

DATE: Year:_____Month:_____Day: _____

First Observed: ☐ OnBeach/Land/Ice ☐ Floating ☐ Swimming ☐ Anchored

LOCATION: State:_____ County:_____City:_____
Body of Water:_____
Locality Details:_____
Lat (DD):_____._____N
Long (DD):_____._____W

☐ Actual ☐ Estimated

How Determined: (check ONE)

☐ GPS ☐ Map ☐ Internet/Software ☐Other_____

CONDITION AT INITIAL OBSERVATION (Check ONE)

☐ 1. Alive
☐ 2. Fresh Dead
☐ 3. Moderate Decomposition
☐ 4. Advanced Decomposition
☐ 5. Mummified/Skeletal
☐ 6. Condition Unknown

LEVEL A EXAMINATION

☐ Restrand Examined? ☐ YES ☐ NO

DATE: Year:_____Month:_____Day: _____

First Examined: ☐ OnBeach/Land/Ice ☐ Floating ☐ Swimming ☐ Anchored

LOCATION: State:_____ County:_____City:_____
Body of Water:_____
Locality Details:_____
Lat (DD):_____._____N
Long (DD):_____._____W

☐ Actual ☐ Estimated

How Determined: (check ONE)

☐ GPS ☐ Map ☐ Internet/Software ☐Other_____

CONDITION AT EXAMINATION (Check ONE)

☐ 1. Alive
☐ 2. Fresh Dead
☐ 3. Moderate Decomposition
☐ 4. Advanced Decomposition
☐ 5. Mummified/Skeletal

LIVE ANIMAL INFORMATION

INITIAL LIVE ANIMAL DISPOSITION (Check one or more)

☐ 1. Left at Site
☐ 2. Immediate Release at Site
☐ 3. Relocated and Released
4. Disentangled
☐ a. Partially
☐ b. Completely
☐ 5. Died at Site
☐ 6. Died during Transport
☐ 7. Euthanized
☐ 8. Transferred to Rehabilitation:
Date: Year: _____Month: _____Day:_____
Facility:_____

☐ 9. Other:_____

CONDITION/DETERMINATION (Check one or more)

☐ 1. Sick
☐ 2. Injured
☐ 3. Out of Habitat
☐ 4. Deemed Releasable
☐ 5. Abandoned/Orphaned
☐ 6. Inaccessible
7. Location Hazardous
☐ a. To animal
☐ b. To public
☐ 8. Unknown/CBD
☐ 9. No Rehabilitation Options
☐ 10. Other: _____

DEAD ANIMAL INFORMATION

CARCASS STATUS (Check one or more)

☐ 1. Frozen for Later Examination/Necropsy Pending
☐ 2. Left at Site ☐ 5. Landfill ☐ 8. Towed:
Lat_____Long_____
☐ 3. Buried ☐ 6. Incinerated ☐ 9. Sunk: Lat_____Long_____
☐ 4. Rendered ☐ 7. Composted ☐ 10. Unknown/Other_____

DEAD ANIMAL EXAM ☐ YES ☐ NO

☐ Photos Only ☐ External Exam ☐ Partial Internal Exam ☐ Complete Internal Exam
☐ Carcass Fresh ☐ Carcass Frozen/Thawed

CARCASS CODE AT EXAM ☐ Code 2 ☐ Code 3 ☐ Code 4

EXAMINED BY: _____
Date: Year:_____**Month:**_____**Day:**_____

PHOTOS/VIDEOS TAKEN: ☐ YES ☐ NO
Photo/Video Disposition:_____

MORPHOLOGICAL INFORMATION

SEX (Check ONE)

☐ 1. Male
☐ 2. Female
☐ 3. Unknown

ESTIMATED AGE CLASS (Check ONE)

☐ 1. Adult ☐ 4. Pup/Calf
☐ 2. Subadult ☐ 5. Unknown
☐ 3. Yearling

☐ Whole Animal ☐ Partial Animal

Straight Length:_____ ☐ cm ☐ in
☐ Actual ☐ Estimated ☐ Not Measured

Weight:_____ ☐ kg ☐ lb
☐ Actual ☐ Estimated ☐ Not Weighed

SAMPLES COLLECTED (Check one or more)

☐ 1. Histology ☐ 2. Other Diagnostics ☐ 3. Life History
☐ 4. Skeletal ☐ 5. Other _____

PARTS TRACKING (Check one or more)

☐ 1. Scientific Collection ☐ 2. Educational Collection
☐ 3. Other:_____

OCCURRENCE DETAILS

Was the Marine Mammal Human Interaction Report completed? ☐ YES ☐ NO

Findings of Human Interaction: ☐ YES ☐ NO ☐ Could Not Be Determined (CBD)

Evidence of:
1. Vessel Interaction ☐ YES ☐ NO ☐ CBD
2. Shot ☐ YES ☐ NO ☐ CBD
3. Fishery Interaction ☐ YES ☐ NO ☐ CBD
4. Entangled ☐ YES ☐ NO ☐ CBD
5. Ingestion ☐ GEAR ☐ DEBRIS ☐ NO ☐ CBD
6. Other Human Interaction: _____

If YES, what was the likelihood that the human interaction contributed to the stranding event?

☐ Uncertain (CBD) ☐ Improbable ☐ Suspect ☐ Probable

Gear/HI Items Collected? ☐ YES ☐ NO Gear Disposition: _____

Other Findings Upon Level A: ☐ YES ☐ NO ☐ Could Not Be Determined (CBD)

If Yes, Choose one or more: ☐ 1. Illness ☐ 2. Injury ☐ 3. Pregnant ☐ 4.Other: _____

How Determined (Check one or more): ☐ Photos Only ☐ External Exam ☐ Partial Internal Exam
☐ Complete Internal Exam (Necropsy) ☐ Other: _____

GE# _____

(NMFS Use)

Group Event: ☐ YES ☐ NO

If Yes, Type: ☐ Cow/Calf Pair ☐ Mass Stranding ☐ UME # Animals:_____☐ Actual ☐ Estimated

TAG DATA		ID#	Color	Type	Placement* (Circle ONE)	Applied	Present	Removed
Tags Were:								
Present at Time of Stranding (Pre-existing):	☐ YES ☐ NO				D DF L R LF LR RF RR V	☐	☐	☐
Applied during Stranding Response/Release:	☐ YES ☐ NO							
Applied during Rehabilitation/Release:	☐ YES ☐ NO				D DF L R LF LR RF RR V	☐	☐	☐
Absent but Suspect Prior Tag:	☐ YES ☐ NO							
					D DF L R LF LR RF RR V	☐	☐	☐
					D DF L R LF LR RF RR V	☐	☐	☐

* D= Dorsal; DF= Dorsal Fin; L= Left Lateral Body R= Right Lateral Body LF= Left Front; LR= Left Rear; RF= Right Front; RR= Right Rear; V= Ventrum

ADDITIONAL IDENTIFIER: _____ **(**If animal is restranded, please indicate any previous field numbers here)

ADDITIONAL REMARKS:

DISCLAIMER

THESE DATA SHOULD NOT BE USED OUT OF CONTEXT OR WITHOUT VERIFICATION. THIS SHOULD BE STRICTLY ENFORCED WHEN REPORTING SIGNS OF HUMAN INTERACTION DATA.

DATA ACCESS FOR LEVEL A DATA

UPON WRITTEN REQUEST, CERTAIN FIELDS OF THE LEVEL A DATA SHEET WILL BE RELEASED TO THE REQUESTOR PROVIDED THAT THE REQUESTOR CREDIT THE STRANDING NETWORK AND THE NATIONAL MARINE FISHERIES SERVICE. THE NATIONAL MARINE FISHERIES SERVICE WILL NOTIFY THE CONTRIBUTING STRANDING NETWORK MEMBERS THAT THESE DATA HAVE BEEN REQUESTED AND THE INTENT OF USE. ALL OTHER DATA WILL BE RELEASED TO THE REQUESTOR PROVIDED THAT THE REQUESTOR OBTAIN PERMISSION FROM THE CONTRIBUTING STRANDING NETWORK AND THE NATIONAL MARINE FISHERIES SERVICE.

PAPERWORK REDUCTION ACT INFORMATION

PUBLIC REPORTING BURDEN FOR THE COLLECTION OF INFORMATION IS ESTIMATED TO AVERAGE 30 MINUTES PER RESPONSE, INCLUDING THE TIME FOR REVIEWING INSTRUCTIONS, SEARCHING EXISTING DATA SOURCES, GATHERING AND MAINTAINING THE DATA NEEDED, AND COMPLETING AND REVIEWING THE COLLECTION OF INFORMATION. SEND COMMENTS REGARDING THIS BURDEN ESTIMATE OR ANY OTHER ASPECT OF THE COLLECTION INFORMATION, INCLUDING SUGGESTIONS FOR REDUCING THE BURDEN TO: CHIEF, MARINE MAMMAL AND SEA TURTLE CONSERVATION DIVISION, OFFICE OF PROTECTED RESOURCES, NOAA FISHERIES, 1315 EAST-WEST HIGHWAY, SILVER SPRING, MARYLAND 20910. NOT WITHSTANDING ANY OTHER PROVISION OF THE LAW, NO PERSON IS REQUIRED TO RESPOND, NOR SHALL ANY PERSON BE SUBJECTED TO A PENALTY FOR FAILURE TO COMPLY WITH, A COLLECTION OF INFORMATION SUBJECT TO THE REQUIREMENTS OF THE PAPERWORK REDUCTION ACT, UNLESS THE COLLECTION OF INFORMATION DISPLAYS A CURRENTLY VALID OFFICE OF MANAGEMENT AND BUDGET (OMB) CONTROL NUMBER.

OMB Control No. 0648-0178; Expiration Date: 6/30/2024

Marine Mammal Human Interaction Report

Exam Information *(fill in or circle most appropriate)*

1 Field #: _____ Species: _____

2 Examiner: _____ Recorder: _____

3 Date of exam:_____ Condition code (at exam): 1 2 3 CBD

4 Preservation: alive fresh frozen frozen/thawed Body condition: emaciated not emaciated CBD

5 Documentation: digital print slide video Image disposition:_____

6 Integument : normal abnormal decomposed % Skin missing: <10% 10-25% 25-50% >50%

7

Explanation of terms:
YES = I have examined the area and/or found signs of this pathology, natural marking, or human interaction
NO = I have examined the area and/or did not find signs of this pathology, natural marking, or human interaction
CBD = I have examined the area and could not determine whether there were signs of human interaction (*i.e.* the part was missing, degraded, or signs were ambiguous)
NE = I did not examine the area
NA = this animal doesn't normally have that part (*i.e.* seals have no peduncle, dolphins have no rear flippers)

	WHOLE BODY EXAM	YES	NO	CBD	NE	NA	Image taken
8	External pathology *(pox, tattoo lesion, abscess, fungal patches)*						
9	Natural markings *(scars, tooth rakes, unusual pigmentation)*						
10	Appendage(s) removed / Mutilation *(with instrument)*						
11	Pelt removed / Mutilation *(with instrument)*						
12	Body sliced / Mutilation *(with instrument)*						
13	Gear / Debris present on animal *(including tags)*						
14	Gear / Debris retained *(name & contact info in Comments)*						
15	HI lesions *(fishery, gunshot, propeller, healed HI scar, brand)*						

16 Predation / scavenger damage *(circle all anatomical areas where damage hinders evaluation; numbers coincide with anatomical areas below)*: 17 18 19 20 21 22 23 24 25 26 27 28 29 NONE

FILL IN TABLE FOR **ALL POSSIBLE FINDINGS OF HI**
Do not use for natural markings/pathology.

						Type of Lesion					Origin of Lesion									
											Gear- Line			Gear/Debris			Other			
	DETAILED EXAM OF ANATOMICAL AREAS	YES	NO	CBD	NE/NA	Impression/ Laceration	Penetrating wound	Healed HI scar	Abrasion	Other / CBD	Twine / line	Net	MO/MU/CBD*	Hook	Packing Band	Other / CBD	Propeller	Gunshot	Other / CBD	Image taken?
17	Rostrum/snout																			
18	Mandible																			
19	Head and/or neck																			
20	L Front appendage																			
21	R Front appendage																			
22	L Body																			
23	R Body																			
24	Dorsum/dorsal fin																			
25	Ventrum																			
26	Peduncle																			
27	L Rear appendage																			
28	R Rear appendage																			
29	Flukes/tail																			

* If Gear-Line is the lesion origin, mark the MO/MU/CBD column: "MO" for monofilament, "MU" for multifilament, and "CBD" if the type of line cannot be determined

Field #:_____

	INTERNAL EXAM Date _____	YES	NO	Partial	CBD	Image taken	Detailed Info *(circle all that apply)*
30	Internal exam conducted				■	■	*Details in Comments section -use line number*
31	Bruising/blunt trauma			■			*Details in Comments section -use line number*
32	Skeleton examined				■		*Details in Comments section -use line number*
33	Broken bones present			■			*Associated tissue reaction: YES NO CBD*
34	Mouth/GI tract examined *(circle contents)*				■		*intact prey partially digested hard parts only* ***debris/gear*** *empty other*
35	Lungs/bronchi examined				■		*Details in Comments section -use line number*
36	Lung/bronchi contents			■			*froth fluid air* (color:)
37	Bullet/projectile found			■			*found using: CT X-ray dissection (collected? Y N)*
38	Other lesions noted			■	■		*Details in Comments section -use line number*

39 **Comments** (*note line number from left margin before each comment*):

40 **Findings of Human Interaction:** ☐YES ☐NO ☐CBD

(Exam Type: ☐ Photos Only ☐ External Exam ☐ Partial Internal Exam ☐ Complete Internal Exam (necropsy))

41

☐ Entanglement (gear__ debris__ CBD__)	☐ Vessel trauma (sharp__ blunt__ both__)	
☐ Hooking (recreational__ commercial__ CBD__)	Gunshot	☐ Mutilation
☐ Ingestion (gear__ debris__ CBD__)	☐ Harassment	☐CBD/Other_____

42 **Stranding Event History/Circumstances:**

43 **INITIAL HUMAN INTERACTION EVALUATION:** If you marked YES above (line 40) evaluate the external exam, necropsy, carcass condition and circumstances surrounding the stranding event to answer the question below. *Remember to be conservative in your subjective evaluation*.
What is the likelihood that the finding of human interaction (line 40), contributed to the stranding event?

0: Uncertain (CBD) 1: Improbable 2: Suspect 3: Probable

44 **Justification:**

Final human interaction evaluation requires additional data from level B and C analyses as well as review by experts (e.g. a veterinary pathologist)

Appendix C - Gear Checklist

Example of a *Field Response Checklist* (provided by The Marine Mammal Center: http://www.marinemammalcenter.org/**).**

Field Response Checklist

Latest Edit: Dave Zahniser Mar 23, 2019

Other Supplies

Tracking:

- ☐ Hydrophone - VR100
- ☐ Hydrophone Mic
- ☐ Hydrophone pole
- ☐ Hydrophone Charger
- ☐ Pingers - Asst. Frequencies

Misc:

- ☐ Leather Gloves
- ☐ Duck Tape
- ☐ Multi-tool
- ☐ Helmets
- ☐ PFDs
- ☐ Binoculars

Video/Photograpy

GoPro:

- ☐ Cams
- ☐ Batteries
- ☐ Chargers
- ☐ Flash Memory
- ☐ Mounts

Field Anesthesia

- ☐ Anesthesia Machine
- ☐ O_2 Canister
- ☐ Wrench for O_2 tank
- ☐ Mask - Small
- ☐ Mask - Large
- ☐ Reservoir Bags: 3, 4, 5 Liter
- ☐ Isoflurane (2 bottles)
- ☐ Isoflurane Bottle Adapter
- ☐ Tubing (2)
- ☐ Sodasorb

Medical Kit

Needles:

- ☐ 16G x 1.5”
- ☐ 18G x 3.5”
- ☐ 18G x 1.5”
- ☐ 18G x 1.0”
- ☐ 20G x 3.5”
- ☐ 20G x 1.5”
- ☐ 20G x 1.0”

Syringes:

- ☐ 1.0 mL (40)
- ☐ 3.0 mL (20)
- ☐ 6.0 mL (10)
- ☐ 12.0 mL (10)
- ☐ 20.0 mL (10)

Ventilation:

- ☐ Ambu Bag
- ☐ ET Tubes: 6,7,8,9,10,12,14
- ☐ ET Tube Stylet
- ☐ Laryngoscope
- ☐ Scope Batteries
- ☐ Jaw Ropes
- ☐ ET tube ties
- ☐ Sterile Lube

Instruments & Supplies:

- ☐ Eye Lube
- ☐ Sterile H_2O (5)
- ☐ Saline
- ☐ Chlorhexidine Scrub
- ☐ Small Surgery Pack
- ☐ Scalpels (10 and 11)
- ☐ Disentanglement Scissors
- ☐ Hemostats (2)
- ☐ Sharps Container
- ☐ Blood Tubes
- ☐ Vacutainer & Adapter

Medical Kit

Misc:

- ☐ Stethoscope
- ☐ Safety Glasses (2)
- ☐ Exam Gloves
- ☐ Darting Worksheet
- ☐ Field Logs
- ☐ Pens, Sharpies
- ☐ Clipboard
- ☐ Tape Measure (cm)
- ☐ Flipper Tags
- ☐ Flipper Tag Gun
- ☐ Labeling Tapen
- ☐ Duck Tape
- ☐ Zip Lock Bags
- ☐ Grease Markers
- ☐ Calculator
- ☐ Long Nose Pliers
- ☐ Pelican Cases (3)

Drugs

Sedatives:

- ☐ Medetomidine (20 mg/mL)
- ☐ Butorphanol (10 mg/mL)
- ☐ Butorphanol (50 mg/mL)
- ☐ Midazolam (5 mg/mL)
- ☐ Midazolam (50 mg/mL)

Reversals:

- ☐ Atipamezole (3 full bottles)
- ☐ Naltrexone (1 full bottle)
- ☐ Flumazenil (10 bottles)

Emergency Drugs:

- ☐ Doxapram
- ☐ Epinephrine
- ☐ Atropine
- ☐ Pentobarbital (Euthasol)

Darting Supplies

Projector:

- ☐ Dart Projector
- ☐ CO2 Cartridges
- ☐ CO_2 Adapter
- ☐ Range Finder
- ☐ Extra Battery (RF)
- ☐ Pressure Reference
- ☐ Extra Breach Pin
- ☐ Bore Cleaner
- ☐ Anemometer

Darts:

- ☐ Dart Bodies
- ☐ Dart Tailpieces
- ☐ Stabilizers
- ☐ Caps
- ☐ Red Sleeves
- ☐ Green Sleeves
- ☐ Pin
- ☐ Coupler
- ☐ 20mL Syringes
- ☐ Long Paperclips
- ☐ Dart Needle Covers
- ☐ Silicone Dart Lube
- ☐ Hemostats

Needles - Barbed:

- ☐ 25 mm
- ☐ 30 mm
- ☐ 40 mm
- ☐ 60 mm

Needles - Plain:

- ☐ 25 mm
- ☐ 30 mm
- ☐ 40 mm
- ☐ 60 mm
- ☐ Practice

The Marine Mammal Center

Example of a *Capture Gear Checklist* (adapted from the Alaska Department of Fish and Game Steller sea lion program).

DISENTANGLEMENT CAPTURE GEAR CHECKLIST

Animal capture/restraint in skiff

Capture Skiff (boat #1)

- ☐ 1 short capture pole
- ☐ 1 long capture pole
- ☐ Flathead screwdriver
- ☐ 2 Shepherd's hooks
- ☐ Retractable boat pole
- ☐ Bent PVC pole
- ☐ 3-4 flipper loops
- ☐ dive slate/pencil

Assist Skiff (boat #2)

- ☐ 1 short capture pole
- ☐ 1 long capture pole
- ☐ Flathead screwdriver
- ☐ 2 Shepherd's hooks
- ☐ Retractable boat pole
- ☐ 2 flipper loops
- ☐ dive slate/pencil

Cutting tools

Capture Skiff (boat #1)

- ☐ **1 pair dykes**
- ☐ **1 pair sharp scissors**
- ☐ 1 net knife and hook
- ☐ 1 "cat claw" twine cutter
- ☐ 2 Victorinox knives
- ☐ 1 fish hook remover

Assist Skiff (boat #2)

- ☐ **1 pair dykes**
- ☐ **1 pair sharp scissors**
- ☐ 1 net knife and hook
- ☐ 1 "cat claw" twine cutter
- ☐ 1 Victorinox knife

Miscellaneous

- ☐ 2 clean towels to cover eyes
- ☐ Rubber wedge/mouth gag – if hooked
- ☐ Bucket to cool animal
- ☐ Emergency blankets
- ☐ Hot water bottles
- ☐ Hand warmers
- ☐ Knee pads
- ☐ Garbage bags
- ☐ Spare Ziplocks
- ☐ Spare reading glasses

Sampling/Data recording

- ☐ Permit
- ☐ Rangefinder
- ☐ Data notebook
- ☐ 3 pencils/1 sharpie
- ☐ Waterproof camera; spare batteries
- ☐ GoPro; spare batteries
- ☐ 2 pair binoculars
- ☐ 2 watches – time synced

Measure

- ☐ Flexible measuring tape
- ☐ Retractable measuring tape

Tagging and Marking

- ☐ 2 pair tagging pliers
- ☐ 4 pair Allflex flipper tags
- ☐ 2 bottles hair dye
- ☐ 2 tubes cream developer
- ☐ Small pair scissors
- ☐ 4 pair latex gloves
- ☐ 2 paint sticks

Head- mount satellite tagging

- ☐ Satellite tag
- ☐ 2-part 5-minute epoxy
- ☐ 2 epoxy dispensers
- ☐ 2 sturdy cups for mixing
- ☐ 3 tongue depressors (mix glue, apply tag)
- ☐ Small bottle acetone and rag
- ☐ 4 pair latex gloves

Flipper satellite tagging

- ☐ SPOT satellite tags
- ☐ 2 leather punches
- ☐ Spare stainless screws
- ☐ Phillips screwdriver/Leatherman
- ☐ Spare magnet to turn tag on
- ☐ Q-tips & alcohol
- ☐ Tagging cheat sheet w/photos

Appendix D – Disentanglement Form

Example of a *Steller sea lion disentanglement form* that could be adapted for small cetaceans (provided by Protected Resources Division, NMFS Alaska Region and Alaska Department of Fish and Game Steller sea lion program).

STELLER SEA LION DISENTANGLEMENT FORM

Date: **ADF&G No:** **NMFS No:**

RESPONDERS:

1. Name of vessels and responders in each during darting:
2. Responders on shore:
3. Veterinarian:

CONDITIONS

1. Sea state: 2. Wind direction and speed: 3. Other:

ENTANGLEMENT

1. Location of haulout/rookery: 2. Location of animal: 3. Distance of animal to water: 4. Other:
5. Type of entanglement:
- Description of entanglement:
- Entangling material:

DARTING

1. Age and gender estimation:
2. Initial size estimate kg: lbs:

Drug	Dose range for size(mg)	mg given	ml given
Medetomidine			
Butorphanol			
Midazolam			
0.9 % NaCl			

---

3. Darter: Stalk time:
4. Time drugs mixed: Time drugs into dart:
5. Size of dart: Size of needle:
6. Time dart pressurized and loaded into gun: 7. Distance to animal: Pressure loaded:
8. Location of darter (underline): *on shore* *on water*
9. Orientation of darter's line of sight to animal:
10. Time of shot:
11. Dart placement (underline): *right side* *left side* *neck* *shoulder* *thorax* *abdomen* *flank* *hip*
12. Other:
13. Reaction to dart (underline): *startled* *looked* *moved* *none* *stayed on haulout* *went into water and tracked* *went into water and lost*
14. Additional behaviors:
15. Number animals in immediate vicinity: Number animals alerted: Number animals flushed into water:
17. Time of capture: Behavior:

DISENTANGLEMENT PROCEDURES

1. Entanglement (underline): *flasher removed* *neck entanglement removed*
2. Description of event:
3. Other: A. Morphometrics: B. flipper tags applied/location/number: C. hair dye applied/location:
D. sat tag applied/location: E. skin sample/location: F. hair sample/location:
G. whisker/location: H. antibiotic/location/volume: I. hot branding:

MONITORING

1. Start time: End time:
2. Beginning RR: Ending RR:
3. Beginning CRT: Ending CRT:
4. Beginning temp: Ending temp:
5. Other:

Time	BPM	CRT (sec)

REVERSAL AND RECOVERY

1. Time of reversal: 2. Location of injection:
3. Reversal drug dosage:
   - Atipamezole mg: ml:
   - Naltrexone mg: ml:
   - Flumazenil mg: ml:
4. Time to full recovery:
5. Behavior:
6. Dart (underline): *retrieved* *lost* Remaining volume of drugs in dart:
7. Other:

DOCUMENTATION:

FOLLOW UP:

Appendix E – Respiration Rate Form

RESPIRATION RATE DATA FORM

DATE:	OBSERVER NAME:

NOTIFY VETERINARY STAFF IF:

1. Animal holds breath one min or longer.
2. Respiration rate is greater than 8 breaths/minute.
3. Breathing sounds "unusual" (not full, deep, smooth) or if breathing is only "partial" (*i.e.* exhalation only)

HOUR	MIN	SEC	START/END OF ALL PROCEDURES/COMMENTS

Appendix F – Risk Factor Table

Risk factor table based on table provided by The Hawaiian monk seal research program, NMFS.

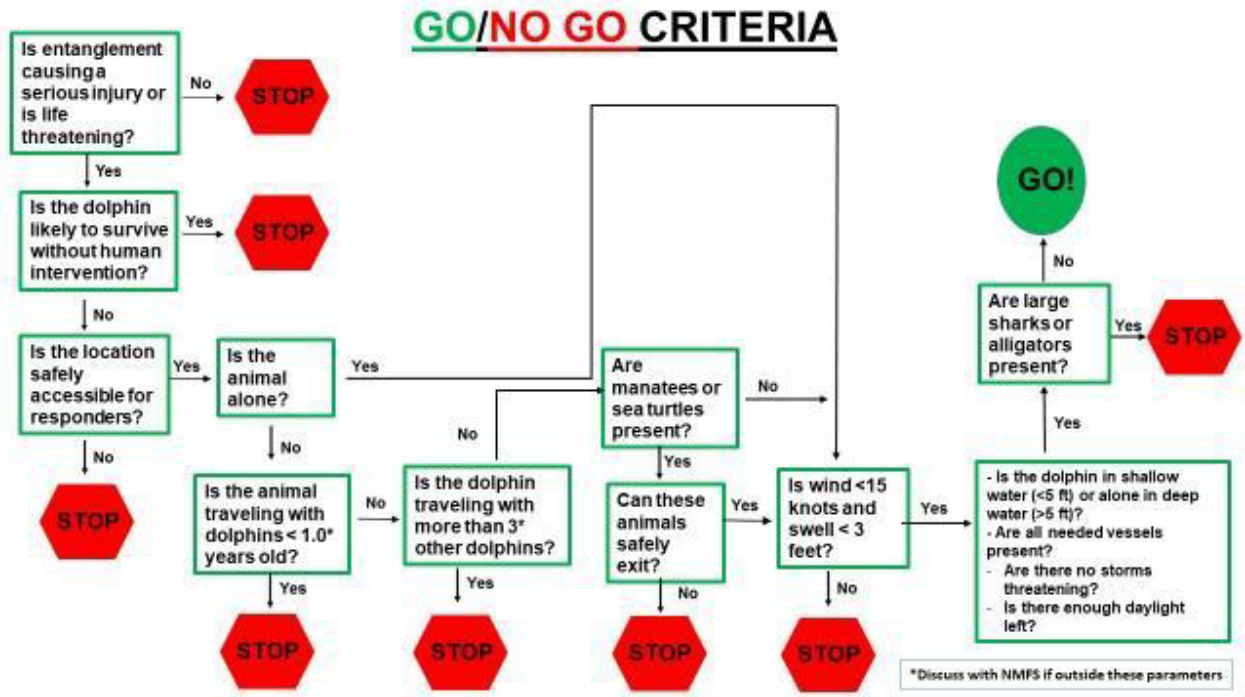
Risk Factor	Risk Factor Category						Risk Level
	Very Low - 1	Low - 2	Medium - 3	Medium High - 4	High - 5	Very High - 6	
Environment	Very Acceptable	Acceptable	Moderately Acceptable	Moderately Dangerous	Dangerous	Very Dangerous	
Team Selection and Fitness	Excellent Team	Good Team	Appropriate Team	Marginal Team	Poor Team	Very Poor Team	
Animal selection and condition	Healthy (besides entanglement)	Healthy (besides entanglement)	Mildly Compromised Health	Moderately Compromised Health	Highly Compromised Health	Highly Compromised Health	
Permits & Authorization	Excellent		Good		Poor		
Resources: Equipment, PPE, communication, etc.	Excellent		Good		Not Prepared		
Mission Complexity: New or experimental, time sensitive, etc.	Simple	Standard	Moderately Complex		Very Complex	Extremely Complex	
If any risk level equals:	Medium-High	Discuss with capture lead or immediate supervisor before proceeding.					
	High – Very High	Contact NMFS					

Key considerations or questions to be asked in the risk factor analyses (GAR):

- ***Health and behavior assessment:*** All animals will have pre-existing entanglement injuries. Ideally, previous observations via photos or video will have allowed for an initial assessment of health prior to the response, including evidence of malnutrition/emaciation, active infection or abscesses, etc. During the response, observe current body condition, responsiveness (responds normally to natural stimuli), or if there are any external or behavioral abnormalities including abnormal breathing patterns.
- ***Weather and tide concerns:*** Does weather pose a threat to the animal or responders (*i.e.*, heat stress, hypothermia, large waves, or threatening storms)? If so, is there a way to mitigate it? Consider the animal's body temperature before, during, and after handling. Is the tide coming in or going out, how high/low is it and how can it impact the event?
- ***Habitat concerns:*** Habitat (*i.e.*, location, water depth) should be assessed for hazards to animals and responders.
- ***Equipment:*** Is all necessary gear functional, available, and ready? This includes, but is not limited to, vessels, capture net, tagging, sampling, instrumentation, disentanglement tools, emergency equipment, temperature mitigation gear (*e.g.*, shade, bucket for water), and transport gear (*e.g.*, truck, boat).
- ***Presence of other small cetaceans:*** Are there other small cetaceans, or other wildlife in the area that may be disturbed by the handling? Is there a potential for other small cetaceans to approach and disrupt the target animal or responders during capture? Consider other natural and cultural resources nearby.
- ***Egress****:* Has the team assessed all possible hazards in the capture zone? Is there a safe place for non-entangled animals to egress? What hazards are in the capture zone that could potentially cause additional injury to the entangled animal and surrounding animals?
- ***Team composition:*** Are there adequate responders to safely complete the mission and address unforeseen situations; is the team experienced or new? If a veterinarian or veterinary technician is necessary, there should be sufficient personnel to assist with the entanglement response so the veterinary staff can monitor/treat the animal. Ensure that all involved fully understand their roles and everyone understands what warning signs to look for. Designate a human safety officer to monitor fatigue, injury, the animal, and personnel throughout the response.
- ***Public presence:*** Is the response going to be in a public area? Ensure adequate crowd control and outreach. Consider a public briefing before and after the event. Expect to be recorded or live streamed and ensure that all involved look and behave appropriately.

Appendix G – Decision Matrix (Go/No Go)

Example of a *Go/No Go decision matrix* (adapted from information provided by [Alaska Department of Fish and Game Steller sea lion program](#)).



Appendix H – Safety Concerns and Protocols for Dolphin Capture- Release

Based on protocols developed by the Chicago Zoological Society's Sarasota Dolphin Research Program, Harbor Branch Oceanographic Institution, NOAA/NOS Charleston and National Marine Mammal Foundation

INTRODUCTION

The following information is meant to serve as a description of safety protocols and their rationale for conducting bottlenose dolphin capture-release rescue efforts. In this work, we will be operating in a potentially hazardous environment, which requires the capture, sampling, and release of wild dolphins in open waters. These operations will involve activities that include coordinated use of several vessels, sometimes at high speed, and a team of people to deploy a large net to handle and restrain large, wild, inexperienced, compromised marine animals. Safety for people and dolphins must be the highest project priorities and safety is everyone's responsibility.

MEDICAL CONSIDERATIONS

It is the responsibility of each participant to make NMFS and the Capture Lead (CL) aware of any pre-existing medical condition, severe medical allergies, or dependencies on prescription drugs prior to commencement of capture operations. If you are allergic to bee stings, then you should also carry your own personal first aid (epi-pen) as an added precaution. Due to physical demands and the potential for injury and/or disease transmissions, pregnant women must notify NMFS and the CL of their condition, and are strongly advised to limit their participation to boat-based activities that minimize risk. Along similar lines, if you are deemed to have a health risk that could endanger yourself or others, you will not be authorized to participate in these operations. If you have active certification in first aid or CPR, please notify both NMFS and the CL. We may not have a paramedic or EMT with the fleet on some days, but we will be prepared to transfer injured personnel to shore expeditiously. If required, assistance may be provided from staff veterinarians and other team members

who have certification in first aid and/or CPR.

In Case of any Serious Injury or Medical Emergency

1. Immediately notify NMFS/CL who will direct response efforts.
2. Without risk to you, work to stabilize and support the victim being careful to limit any movement of the neck and spine.
3. Help secure the area and notify proper authorities for emergency transportation (Notify 911 for shore-based ambulance response or USCG via VHF Ch. #16 for airlift). Alert other boats and direct shore-based emergency response to the nearest point of pick-up.
4. Make ready a first aid platform with all necessary medical treatment kits.
5. Depending on the situation, the CL will decide on the best/safest course of action regarding any dolphins that may be in the net corral or on board the veterinary examination boat.

FIELD COMMUNICATION

Only authorized cell phones and VHF radios (on assigned channel, probably 18) will be utilized for ship-to-ship and ship-to-shore communication. Boat skippers should limit VHF radio conversations in order to allow necessary communications between the CL, NMFS, and the Catcher to take precedence. All crew members should be briefed by skippers on operation of the radios and protocols for emergency transmissions (Channel 16 for the Coast Guard).

SAFETY EQUIPMENT

In order to maximize safety in our working environment, each vessel is equipped with approved USCG safety equipment, personal flotation devices (PFDs), throw cushions, fire extinguishers, and first aid kits. A kit for first-response to stingray strikes is also available.

RESEARCH VESSELS/OPERATION AND SAFETY GUIDELINES

- **Before boarding the boats:** Bracelets, watches, necklaces, piercings, earrings, and rings can cause injury to both people and animals. They can get tangled in the net. Remove and secure ALL such personal belongings and

items BEFORE boarding each morning. Make sure that you have hard-soled shoes (not open-toed sandals) to wear in the water.

- **General Boat Operations/Boat Skipper Responsibilities**: Assigned 'boat skippers' are responsible for the safety of their crew and for the safe operation, maintenance, docking and cleanliness of their respective vessels. Skippers should familiarize themselves with the operational characteristics of their boat and safety equipment. If any skipper is unfamiliar with the region, then they should consult charts, exercise great caution, and reduce speed in shallow areas where shoals and sandbars may be present. Use depth poles to confirm depth readings of on-board electronic sensors. Be aware of all markers, channel markers and speed zones (including designated manatee protection areas). If you are unsure of depth, raise (trim up) the outboard motor and slowly make your way to the main channel before resuming on-plane speed. Be careful not to disturb sea grasses, pole the boat through the shallows if necessary. Each boat skipper is responsible for checking to make sure sufficient life vests are on board at all times for their crew.
- **Life Vests/Personal Flotation Devices (PFDs)**: Before departing the dock make sure you are wearing or have quick and ready access to your PFD (make sure that it will fit you). If you are a poor swimmer, then you must wear the PFD while the vessel is underway. ALWAYS WEAR a PFD when you enter the water – do not remove it until all of the animals are restrained in shallow water. Make sure that your PFD returns to your boat at the end of the set.
- **Stay with your buddy**: Each boat skipper will assign pairs of handlers as buddies. You should enter the water together and keep track of one another, working as a team. Always enter the water in the field of view of the skipper – generally this means from the bow (front) of the boat. Enter the water ONLY when your skipper tells you to. **NO ONE SHOULD APPROACH THE NET ALONE – ALWAYS WORK AS A TEAM – NO SINGLE PERSON CAN CONTROL A THRASHING WILD DOLPHIN – PEOPLE HAVE BEEN SERIOUSLY INJURED.**
- **Commands are 'NO' or 'JUMP NOW'**: The call for anyone to go overboard, for any reason, from any vessel is given ONLY by the boat

skipper. To avoid ANY possible confusion during times of rapid deployment in the net setting process, skippers will call “No” to hold fast and “Jump now” to indicate it is safe to go overboard. This helps eliminate the potential for confusing the commands “no” and “go”.

- **Stay away from boat propellers**: In or out of the water; boat propellers can cause serious injuries and mutilation. Skippers will be responsible for operating boats in a safe manner and remain aware of any swimmers and/or animals in their operating zone. Before restarting a boat engine and placing it in gear, each boat skipper should look and call “Clear”; to make certain nobody is near the propeller. Never use the propeller of an outboard to return (climb) aboard any vessel. Remember, on shore, exposed boat propellers can be equally dangerous. Give boats on trailers a wide berth in order to prevent injury.
- **Do not place hands, arms, legs, or fingers in-between boats**: Boats may be ‘rafted’ alongside each other (beam to beam). All boats SHOULD have protective rubber fenders placed between them to avoid damage to both people and boats. Do not place your hands and fingers over the side of the boat when near potential hazards such as other boats, docks and pilings.
- **Watch for boat wakes**: Be alert to other boat traffic and alert others as necessary. Vessels operating in/or near the capture-release sites can produce large wakes, especially when they approach shorelines. Skippers can notify approaching vessels by VHF (Ch. 16) or by visual means (flag) to request a “slow pass.” Even small wakes can cause rafted boats to slam against each other. Prevent serious injuries; NEVER place yourself between two vessels – crushing from extreme forces is a strong possibility.
- **Boat anchors, lines and fenders**: Each boat should be equipped with a primary (bow = front) and secondary (stern = rear) anchor, as well as rafting lines and fenders. It is important for in- water staff to be aware that these outstretched lines and ground anchors can be an unseen hazard. Exercise caution when deploying and retrieving anchors. Note the position of extended anchor lines and safely stow anchors and all lines before getting underway. Each boat should also have dedicated net anchors. These should be recovered and stowed at the end of a set.

- **Boat towing (on water):** Will be done under the advice of the CL. Use a balanced towing harness. Place the engine in neutral and center the steering. Take any unessential equipment and people off disabled craft. Stay well away from the towline trajectory and be aware that heavy boat lines (and metal boat cleats) can unexpectedly break and become high-speed flying projectiles when they give way under the strain of towing a heavy load. Drive/Tow slowly.
- **Boat docks and ramps**: Use caution in/around marinas, boat ramps and dock areas. These can have slippery and uneven surfaces. Use added caution when boarding or disembarking from any boat, or when transferring equipment and personal gear. All loose items or items of value should be secured before entering the dock area. Make sure all boats are secure with lines fore and aft, including spring lines and boat fenders to provide safe access and prevent damage. Wear shoes with non-skid soles or booties on boats. Boat ramps are notoriously slippery at the tide lines.
- **Boat launching and recovery:** Will be done only under the supervision of the boat skipper, CL, or boat owner. Use caution. Be respectful of others. Keep off the active ramp when staging or breaking down.

POTENTIAL VESSEL EMERGENCY SCENARIOS

- **In case of fire:** The boat skipper should verify that all personnel are wearing PFD's and begin immediate evacuation of non-essential personnel. The skipper should call for help and without risk to their own personal safety, work to contain the fire with on-board fire extinguishers. Cut all lines and isolate the burning vessel from all other vessels and personnel in the water to prevent the fire from spreading, recognizing the possibility of the fuel tank exploding. Notify 911 by cell phone if at or near a dock and USCG on VHF marine radio (Ch 16) if at sea. Bring all necessary resources and fire extinguishers to bear and attempt to contain the flame source. If possible and without risk, safely tow the burning craft into an open area down-wind from other vessels and people and secure with an anchor. If such attempts are unsuccessful, or deemed too dangerous, then abandon the boat and allow it to drift and burn in an open area.

- **Inclement weather/Lightning:** Under some circumstances, it may be advisable for NMFS and the CL to decide to release all animals and have staff return to their boats. Crew will secure the vessels for foul weather. Skippers will move boats to the closest safe refuge until conditions improve.
- **Sinking vessel:** If for any reason any boat begins to take on excess water and/or is in danger of capsizing, immediately distribute PFD's and flare signaling kit to crew. Attempt to bail water and stop the source of incoming water. If our own vessels are unable to provide adequate assistance, then call USCG VHF Ch. 16 for help. Provide vessel name, location, # of passengers and status. Signal any nearby vessels. Abandon the boat only as a last resort. The skipper may attempt to slowly ground the boat in shallow water outside the channel.
- **Vessel aground:** Running aground, especially in unfamiliar waters, is a possibility. Skippers and crew should note distinct color changes of water indicating water depth. If the vessel begins to ground, immediately bring the boat to neutral, simultaneously kill the engine, and lift motor. Check the crew for any injuries. Safely disembark crew up-wind from the boat and attempt to refloat it to shallow water. Check the propeller for damage and ensure that the water pump is operating properly before getting underway. Notify other boats if further assistance is required.

SAFETY AROUND THE NET

The net is the primary responsibility of the Catcher. The net measures about 500 yards in length x 16 feet in depth, has a float-line at the surface and a lead line on the bottom.

- **Setting the net**: After the CL gives the go-ahead signal to the Catcher to set the net, the Catcher determines precisely when to execute this instruction based on water depth and conditions. All efforts will be made to limit capture-release activities to waters 5 feet deep or less, with minimal currents, to ensure the safety of the dolphins and capture team. Everyone on board the catch (net) boat must stand clear as the 'Let-go' (large orange ball attached to the

end of the net) is thrown off the stern and the net rapidly pays-out. Failure to do so can result in entanglement and can cause severe injury or can pull you off the boat. If entangled with the net, do not attempt to stop or hold fast. If you feel the net coming tight on any part of your body, let go immediately and yell to the Catcher to 'STOP'. It is EVERYONE'S responsibility to concentrate on the net and the area enclosed by the net to monitor the dolphins and make sure that all of the dolphins are accounted for on each surfacing. Any indication of a dolphin striking the net should be reported immediately.

- **Hang on**! The net boat and other boats will accelerate quickly once the set begins. We mean it!
- **Entering the water: Do not enter the water until so instructed by your skipper.** Before entering the water, make sure that you are not wearing anything that could become entangled in the net or cut the skin of the dolphin (jewelry, watches, buckles, etc.). Usually, every effort will be made to set in shallow water (3 feet -5 feet). WEAR YOUR PFD WHEN YOU ENTER THE WATER, REGARDLESS OF WATER DEPTH, AND DO NOT REMOVE IT UNTIL ALL ANIMALS ARE SECURELY RESTRAINED IN SHALLOW WATER. If a 'deep-water' set occurs, the CL will direct staff to deploy a special floatation mat to support the dolphins. Use a buddy system – always know where your buddy is! Remain on the outside of the net corral until instructed otherwise by the CL.
- **Handling the net:** Follow the CL's instructions and those of the **Net Lead (NL)**. Typically, this will involve spacing the team members evenly around the outside of the perimeter (compass) of the net corral. You should remain close enough to the net to be able to lift and splash the cork line quickly should the animals approach your position, but otherwise do not touch the net unless otherwise instructed by the CL or NL. Be careful to not get your feet entangled in the webbing, and do not stand on the lead line. Slide your feet under the lead line and shuffle the lead line ahead of you with your feet. Never lock your fingers around the net twine or allow yourself to become entangled. If you feel the net

becoming tight on any part of your body, free yourself immediately – request help if necessary.

- **Animals in the corral**: Once the net corral is set, listen to the instructions of the CL, and boat skippers. DO NOT APPROACH THE NET OR ENTANGLED DOLPHINS BY YOURSELF – WORK AS PART OF A TEAM ONLY!!! The CL will direct the other boats to strategically deploy and dispatch personnel around the perimeter of the net. Ideally, animals will remain in the center of the compass, giving personnel sufficient time to deploy around the float line. If necessary, handlers can "splash the float line" when animals approach their position to help avoid their charging or probing the net. Keep 'eyes-on' all animals and note their number and position. Depending on circumstances, conditions and number of animals, attempts may be made by the Catcher and CL to maneuver the net with the boats to split, isolate or crowd animals to a particular area. This may also be done manually by team members under the direction of the NLs.

- **Animals in the net**: Naïve dolphins are likely to strike the net soon after the set is completed, whereas experienced dolphins will often continue to circle inside the net corral. Typically (but not always) they will strike in the deepest part of the compass. A boat will immediately be sent to any area where an animal hits the net and pulls the float line down. If the water at the point where a dolphin entangles is too deep to handle safely with swimmers in PFDs, then a nearby boat will be deployed and efforts will be made to lift and support the net and dolphin from the boat. At the discretion of the skipper and CL, personnel will be deployed into the water with PFDs to begin the process of untangling the dolphin and transferring it to a floating pad. In shallower water, handlers working in teams should pull the cork line in both directions away from an entangled dolphin to minimize the entanglement, while other handlers move to the animal and support and restrain the animal and net from outside the net (do not get between the dolphin and the net, as you can become wrapped in the net with the animal – this has happened and caused serious injuries). The dolphin should be secured by reaching first around the body between the pectoral flippers and the dorsal fin to lift the

head/blowhole above the water's surface as soon as possible (and, at the same time, avoiding the risk of being hit by the fluke or head). Additional handlers should secure first the animal's mid-section and then the tailstock (peduncle) and the head anterior to the pectoral flippers. Extreme care to avoid entanglement should be exercised if the dolphin rolls or spins in the net. Avoid both ends of the dolphin -- dolphin beaks and flukes are very hard and the animals are very strong. Be careful with your hands– do not touch the eyes, blowhole, or genital region. "Check the pecs" – make sure that the pectoral flippers are not entangled and that they lie back flat against the body of the dolphin and are not pulled forward or out.

- **Animal in distress**: If a dolphin exhibits signs of injury, extreme stress or shock (severe arching, unusual respiratory patterns), call for the veterinarian immediately. The vet will evaluate and treat the animal as appropriate. Special 'Dolphin Emergency Meds" kits are carried by the vet.
- **Cutting the net**: This is a last resort used to free a person or animal and will only be done in an emergency by the CL, NLs, or Catcher. Specially designed net knives are available and can be employed as needed. If an animal or person is severely entangled in the net, attempt to gather slack from both sides of the net and alert the CL, NL, and Catcher, who will assess and advise.

- **Retrieving the net**: After each net set, decisions will be made as animals are secured, held stationary and moved from the net to the sampling and examination vessel. Listen carefully for instructions when you are called to help maneuver and/or secure points on the net compass. Pulling, cleaning and stacking the net can be done once all animals are safely restrained and secured. When it comes time to pull, clean and stack the net back aboard the catch boat you will be instructed to do so by the Catcher. Many people are sometimes needed in the water behind the net boat to shake the net and clean the algae from it before it comes aboard the boat.

GENERAL SAFETY AND PRACTICAL CONSIDERATIONS

Common sense should prevail. Use good judgment and remain alert and aware

of your surroundings at all times. Ask questions if you are unsure of what is happening or what you should be doing.

- **Call loudly if you are in distress or need help**: If you are hurt or need assistance make sure to call out to alert those around you that you need help.
- **Use of disinfectants and special handling of animals with suspected zoonotics:** Some animals may have potentially zoonotic (transmissible) diseases. In such cases, contact should be limited as directed by the veterinarian. People with open wounds, cuts, or sores should refrain from direct contact with these animals. All other animal handling staff should take added precautions of protective clothing, gloves and surgical masks if deemed necessary. Following the handling of animals suspected of having a potentially transmissible condition, any/all persons (and equipment) who may have had contact with that animal, should isolate themselves to an area away from others and begin disinfecting with approved disinfectants, under the guidance of the senior veterinarian, being careful to avoid contact with the eyes and/or other sensitive areas of the body. Any/all clothing (rash guards, shirts, etc.) should also be removed and soaked for a minimum of 5 minutes in a disinfecting solution.
- **No Diving**: Under NO circumstances shall anyone dive into the water headfirst. Water visibility is often poor with a varied hard sand to soft mud bottom and can pose dangerous hazards. Use a boat ladder or ease yourself gently overboard in order to avoid the risk of serious head, neck and/or spinal injury and the risk of suddenly frightening the dolphins.
- **Noise and talking**: Boat skippers should always take added precautions in operation of boats in areas around the net and/or where animals are being restrained. Whenever possible turn engines off to avoid unnecessary noise that might agitate or alarm animals or interfere with communication among team members, and caution crew against jumping, splashing or banging equipment on the boat hull while around the boat. Please refrain from excessive talking and noise while capture-release operations are underway. Do not distract boat skippers and keep a watchful eye, especially while boats are underway and while working in-water with restrained animals. Boat

skippers, in-water animal care staff, and especially those in close proximity to the veterinary examination boat, should speak quietly and softly while procedures are underway. Boat skippers also need to consider the underwater noise of propellers and the adverse effects that may have on dolphins that are being restrained nearby.

- **No smoking**: A no-smoking rule will be in effect aboard all vessels, around fuel docks and in any/all areas that are in close proximity to others.
- **No bare feet**: Anyone entering the water does so at his or her own risk. Hard-sole diving booties or other similar binding footwear is required (Kevlar boots are available in stores, providing good protection to mid-calf – some staff members have these). Do not wear swim fins or shoes with buckles as these can easily tangle in the net. The seafloor has hazards from oyster shells to broken glass, derelict crab traps and debris. In this environment, it is advisable to walk slowly and shuffle one's feet in order to avoid stepping on stingrays. If stung or injured, notify the paramedic immediately. A stingray treatment kit consisting of hot water and a boot is available. In addition, in some areas jellyfish and sea-lice pose risks. People who are allergic to bee stings are at a higher risk and need to advise NMFS, the CL and the boat skipper if any such allergic reactions are possible.
- **No cell phones or cameras**: No unauthorized use of cell phones or cameras will be allowed. Cell phones should be turned off during on-water operations and any/all images taken are subject to review and approval of NMFS before they can be shown to anyone outside of the project.
- **Personal comfort**:
    - *Temperature concerns*: Bring warm clothing and it is suggested that you have a wet suit, booties, hat and gloves. Monitor your own signs of dropping internal temperature, including minor to moderate shaking and problems speaking and inform your skipper, CL, and NMFS immediately. In the event that you exhibit signs of hypothermia, you should get out of the water and dry off to start re-warming.
    - *Sun protection*: Use ample sunscreen (waterproof SPF 15 or higher) and protective clothing (hats/long sleeves, polarized sunglasses) to protect against sunburn and discomfort. Re-apply sunscreen during the day.

- *Hydration*: Rehydrate often. Prolonged exposure to the elements and exhausting work efforts involved in the capture-release process require special considerations and personal caution. Water coolers are placed on-board assigned vessels and everyone is encouraged to drink plenty of fluids.

- *General considerations:* Long days in the hot sun are exhausting. Stay alert and get plenty of sleep the night before. In cool weather, hypothermia can occur at any time, from leaving the dock in the morning and running to the capture site, to standing for long periods in moderately cold water, to running wet back to the dock. There are no restrooms aboard the boats; efforts will be made to have at least one shore-side stop at public restroom facilities during the day. Plan your food/drink intake accordingly.
- **Personal responsibility**: Participants are expected to exhibit responsible behavior and a professional attitude. You represent your institution or agency, and NMFS.