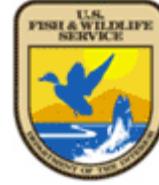




National Oceanic and Atmospheric Administration  
National Marine Fisheries Office of Protected Resources  
Marine Mammal Health and Stranding Response Program



U.S. Fish and Wildlife Service  
Fisheries and Habitat Conservation  
Marine Mammal Program

## **INTERIM**

# **BEST PRACTICES** **MARINE MAMMAL STRANDING RESPONSE,** **REHABILITATION, and RELEASE:** **STANDARDS FOR RELEASE**

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## I. EXECUTIVE SUMMARY

The process of rescue, rehabilitation, and release of wild marine mammals is allowed for specific categories of people under listed conditions by the Marine Mammal Protection Act (MMPA) [16 U.S.C. 1379 Section 109(h)]. Section 402 (a) of Title IV of the MMPA specifically mandates that “The Secretary shall... provide guidance for determining at what point a rehabilitated marine mammal is releasable to the wild” [16 U.S.C. 1421 Section 402 (a)]. This document fulfills the statutory mandate and is not intended to replace marine mammal laws or regulations.

The purposes of this document are as follows:

1. To provide guidance for determining release of rehabilitated marine mammals to the wild including marine mammal species under the jurisdiction of the Department of Commerce's National Marine Fisheries Service (NMFS) and those under the jurisdiction of the Department of the Interior's Fish and Wildlife Service (FWS),
2. To state the NMFS and FWS legal requirements and provide recommendations for medical, behavioral, and developmental assessment of rehabilitated marine mammals prior to release,
3. To identify the persons and agencies responsible for completing an assessment of a rehabilitated marine mammal for release determination and to describe the communication requirements and process with NMFS or FWS,
4. To state the NMFS and FWS requirements and recommendations for identification of rehabilitated marine mammals prior to release, release site selection, and post-release monitoring,
5. This document does not include guidance for the following situations:
  - a. Immediate release following health assessment and/or emergency triage typically associated with mass stranding events, out of habitat rescues, and disentanglement efforts.
  - b. Release following relocation of healthy marine mammals.

In accordance with the MMPA [Title IV, Sec.402 (a)], these guidelines were developed through NMFS and FWS in consultation with marine mammal experts through review and public comment of the 1997 draft NOAA Technical Memo “Release of Stranded Marine Mammals to the Wild: Background, Preparation, and Release Criteria.” Comments from the public review process and other outstanding issues were compiled by NMFS and FWS. The agencies consulted with experts in three areas: cetaceans, pinnipeds and sea otters, and manatees. The experts reviewed and discussed the public comments and provided individual recommendations. This current document encompasses revisions and updates to the 1997 draft and is titled differently.

These guidelines provide an evaluative process to aid in the determination if a stranded wild marine mammal following a course of treatment and rehabilitation is suitable for release to the wild. These guidelines describe “Release Categories” for rehabilitated marine mammals of each taxonomic group, i.e. cetaceans, pinnipeds, manatees, sea otters and polar bears. After completing a thorough assessment as prescribed, the release candidates are to be assigned to a Release Category as follows: **Releasable, Conditionally Releasable, Conditionally Nonreleasable (Manatees only), and Nonreleasable.** This document describes how to characterize and assess animals using several parameters:

- 1). Historical Assessment
- 2). Developmental and Life History Assessment
- 3). Behavior Assessment and Clearance
- 4). Medical Assessment and Clearance
- 5). Release Logistics
- 6). Post Release Monitoring

By using clearly defined Release Categories for rehabilitated marine mammals, NMFS and FWS can evaluate and support the professional discretion of the attending veterinarian and his or hers assessment team (i.e., biologists, veterinarians, animal care supervisors, and other team members of the marine mammal stranding network). Based on these Release Categories, NMFS and FWS can consult experts on challenging cases in which the survival of the rehabilitated marine mammal or its potential to pose a health risk to wild marine mammals is in question.

Refinement of requirements and guidelines for release of rehabilitated marine mammals to the wild is a dynamic process. Use of these standardized guidelines will also aid in the evaluation of rehabilitation procedures, successes, and failures, and will allow for on-going improvement of such protocols. These guidelines are based on the best available science and thus will be revised periodically.

## II. INTRODUCTION

### A. Background

For NMFS species prior to the early 1990s, release decisions were made by individual rehabilitation facilities without much direction or input from NMFS. Decisions were inconsistent and did invoke controversy especially for cetacean cases. The Marine Mammal Commission and NMFS sponsored several workshops focusing on procedures and needs regarding marine mammal strandings, rehabilitation, and release (see Appendix A). Discussions at these workshops provided starting points for establishing objective release criteria. A stronger impetus to formalize these release guidelines came in 1992 when, as part of the Marine Mammal Health and Stranding Response Act, Congress mandated establishing objective guidelines for determining releasability of rehabilitated marine mammals. The MMPA was amended to include Title IV, Section 402(a) and provides that: *“The Secretary [of Commerce] shall, in consultation with the Secretary of Interior, the Marine Mammal Commission, and individuals with knowledge and experience in marine science, marine mammal science, marine stranding network participants, develop objective criteria, after an opportunity for public review and comment, to provide guidance for determining at what point a rehabilitated marine mammal is releasable to the wild.”*

In accordance with the MMPA [Title IV, Sec.402 (a)], these guidelines were developed through NMFS and FWS in consultation with marine mammal experts through review and public comment of the 1997 draft NOAA Technical Memo “Release of Stranded Marine Mammals to the Wild: Background, Preparation, and Release Criteria.” Comments from the public review process and other outstanding issues were compiled by NMFS and FWS. The agencies consulted with experts in three areas: cetaceans, pinnipeds and sea otters, and manatees. The experts reviewed and discussed the public comments and provided individual recommendations. This current document encompasses revisions and updates to the 1997 draft and is titled differently.

### B. Review of Key Legislation Pertinent to Marine Mammal Rehabilitation and Release to the Wild

Congress delegates the responsibility for implementing the MMPA to the Secretary of Commerce and the Secretary of the Interior. Cetaceans and pinnipeds exclusive of walrus are the responsibility of NMFS (i.e., NMFS species). Walrus, polar bears, manatees, and sea otters are the responsibility of FWS (i.e., FWS species). Species under NMFS responsibility are regulated under Part 50 of the Code of Federal Regulations (CFR) (See Appendix B). Any FWS guidance related to marine mammals under FWS responsibility are described in the appropriate taxonomic section of this document.

Rehabilitation and release of wild marine mammals is authorized by key statements within the MMPA 16 U.S. Code 1379, Section 109(h) entitled “Taking of Marine Mammals as Part of Official Duties.” By listed categories of people (i.e., Federal, State, or local government official or employee or a person designated under section 112(c) of the MMPA), this section allows for

humane taking of a marine mammal for its protection or welfare and states that an animal so taken is to be returned to its natural habitat whenever feasible. Regulations that implement the MMPA for NMFS species (50 CFR Sec. 216.27(a)(1)) require that a marine mammal held for rehabilitation be released within six months unless "...the attending veterinarian determines that: (i) The marine mammal might adversely affect marine mammals in the wild (ii) Release of the marine mammal to the wild will not likely be successful given the physical condition and behavior of the marine mammal; or (iii) More time is needed to determine whether the release of the marine mammal in the wild will likely be successful..." Also, under this code "releasability must be re-evaluated at intervals of no less than six months until 24 months from capture or import, at which time there will be a rebuttable presumption that release into the wild is not feasible."

For NMFS species, the 112(c) *Stranding Agreements* are formally established between the *NMFS Regions* and *Stranding Network Participants* (formerly Letters of Agreement or LOAs). Understanding and following the MMPA and implementing regulations, policies, and guidelines, **is the responsibility of all persons involved** in marine mammal rescue, rehabilitation, and release. These guidelines are founded on and support the MMPA and related regulations. The laws and regulations outlined below are therefore fundamental to proper enactment of marine mammal rehabilitation and release. Appendix B contains the full text of these laws and regulations.

### C. Structure of the Document

This document is organized as follows: General Procedures (Section III), Guidelines for Release of Rehabilitated Cetaceans (Section IV), Guidelines for Release of Rehabilitated Pinnipeds (Section V), Guidelines for Release of Rehabilitated Manatees (Section VI), Guidelines for Release of Rehabilitated Sea Otter (Section VII), Policies Regarding Release of Rehabilitated Polar Bears (Section VIII), References (Section IX), Glossary of Terms (Section X), and Appendices (Section XI).

The approach developed in this document primarily involves a complete assessment of animal's health, behavior and release logistics. The assessment is completed by the attending veterinarian and his or hers Assessment Team following this standardized guidance for determining the disposition of a marine mammal after treatment and rehabilitation. Section III, "General Procedures," summarizes the pertinent laws and regulations and outlines the release requirements and recommendations for all species of rehabilitated marine mammals. This section provides an overview of documentation required throughout rehabilitation and release. Parties responsible for release determinations are identified. General principles for developmental, behavioral, and medical assessments of rehabilitated marine mammals are described, as well as methods for post-release identification (i.e. marking and tagging), monitoring, and selection of appropriate release sites.

Because there are several critical variables among each taxonomic group such as natural history, social organization, and species specific rehabilitation and release considerations, these variables are addressed in separate chapters (Sections IV-VIII) (i.e. cetaceans, pinnipeds, manatees, sea

otters, and polar bears). These chapters provide greater detail and rationale for the release guidelines for each marine mammal group.

The reference section lists current literature on marine mammal biology, medicine, rehabilitation, and release. A Glossary of Terms is provided to define key terms initially noted in the text with italics. The Appendices provide ready access to marine mammal laws and regulations and examples of required documentation for rehabilitated marine mammals. Additional appendices include examples correspondence letters between the Stranding Participant and NMFS and lists of Diseases of Concern and related references for cetaceans, pinnipeds, manatees, and sea otters.

#### **D. Funding**

Funding of marine mammal rehabilitation is the responsibility of the rehabilitation facility. Specific resources such as freezers for serum banking, histopathology services, equipment and personnel for post-release monitoring may be provided through NMFS and FWS to support the biomonitoring program. Some costs associated with response and rehabilitation during a Marine Mammal Unusual Mortality Event (UME) may be reimbursed through the UME National Contingency Fund (in accordance with Section 405 of the MMPA). For additional information regarding expense reimbursement, contact the appropriate NMFS or FWS coordinator. For NMFS species, the Prescott Stranding Grant Program is also available as a funding source for marine mammal stranding response and rehabilitation. More information on this program can be found on the following web site: <http://www.nmfs.noaa.gov/pr/health/>.

### III. GENERAL PROCEDURES

#### A. Stranding Agreements, MMPA 109(h) Authority, and Permits for Stranding Response for ESA species

##### NMFS Policies

NMFS may enter into a Stranding Agreement (formerly known as a Letter of Agreement or LOA) with a person or organization for stranding response and rehabilitation. The NMFS Stranding Agreements state that the Stranding Network Participant obey laws, regulations, and guidelines governing marine mammal stranding response and rehabilitation, which include requirements for communications with NMFS, *humane care* and husbandry and veterinary care of rehabilitated marine mammals, and documentation of each stranding response and rehabilitation activity. The Stranding Agreement does not authorize the taking of any marine mammal species listed as endangered or threatened under the Endangered Species Act of 1973 (ESA), as amended. However, authorization to take ESA listed species by the Stranding Network is currently provided under *MMPA/ESA permit #932-1489-01* as amended and requires authorization and direction from with NMFS Regional Stranding Coordinator in the event of a stranding involving a threatened or endangered marine mammal.

##### FWS Policies

Rescue, rehabilitation, and release of non-ESA listed marine mammal species under FWS responsibility is authorized with a *Letter of Authorization (LOA)* issued by the *FWS Division of Management Authority (DMA)* in Washington, DC. For ESA listed species, an LOA holder is authorized under a permit issued by the DMA. *FWS Field Offices* coordinate with LOA and permit holders for all rescue, rehabilitation, and release activities for species under their jurisdiction.

#### B. Parties Responsible for Release Determinations and Overview of Agency Approval

The *attending veterinarian* and his or her *Assessment Team* (i.e., veterinarians, lead animal care supervisor, and consulting biologist with knowledge of species behavior and life history) representing the Stranding Network Participant, Designee, or 109(h) Stranding Participant will assess the animal and make written recommendation for release or nonrelease. **For NMFS species, the recommendation must be sent to the NMFS Regional Administrator and for FWS species to the FWS Field Office and the FWS Division of Management Authority.**

In general for NMFS species, animals that are deemed “Releasable,” only a 15-day advance written notification is necessary; however, 50 CFR Section 216.27 (a)(2)(i)(A) allows for waiving this advance notification in writing by the Regional Administrator. For such waivers, the Stranding Network Participant must submit a protocol for cases involving routine diagnosis (known cause of stranding), treatment, rehabilitation, and release including location of release. These waivers will require pre-approval by the NMFS Regional Administrator on a schedule as prescribed in the Stranding Agreement. The *release determination recommendation* must include a signed statement from the attending veterinarian, in consultation with his or her

Assessment Team, stating that the **marine mammal is medically and behaviorally suitable for release in accordance with the release criteria** (i.e., similar to a health certificate) and include a written *release plan and timeline*. NMFS may also require a concurrence signature from the “*Authorized Representative*” or *Signatory* of the Stranding Agreement. The Regional Administrator (i.e., NMFS staff) will review the recommendation and release plan and provide a signed written notification to the Stranding Network Participant indicating concurrence and authorization to release or direct an alternate disposition (50 CFR Section 216.27) (*letter of concurrence from the Regional Administrator*). For more challenging cases and potential “Conditionally Releasable” cases, plans for release should be submitted well in advance of the 15-day period to provide adequate time for evaluation. Also, it is highly recommended that dissenting opinions among members of the Assessment Team regarding an animal’s suitability for release and/or the release plan be communicated to NMFS or FWS well in advance of the required 15-day advance notice so that additional consultation can be arranged in adequate time for resolution and planning.

By regulation (50 CFR Sec. 216.27 (a)(3), Appendix B), the NMFS Regional Administrator (or Office Director of Protected Resources) has the authority to modify requests for release of rehabilitated marine mammals. In accordance with 50 CFR 216.27 (a)(1), any marine mammal held for rehabilitation must be released within six months of collection unless the “attending veterinarian determines that the marine mammal might adversely affect other marine mammals in the wild, release of the marine mammal to the wild will not likely be successful given the physical condition and behavior of the marine mammal, or more time is needed to determine whether the release of the marine mammal will likely be successful.” If more time is needed, then NMFS will require periodic reporting in writing from the attending veterinarian including a description of the condition(s) of the animal that precludes release and a prognosis of release. NMFS may require that the marine mammal remain at the original rehabilitation facility or be transferred to another rehabilitation facility for an additional period of time, be placed in permanent captivity, or be euthanized. NMFS may also require a change of conditions of the release plan including the release site and post-release monitoring. An expanded release plan may be required including a justification and detailed description of the logistics, tagging, location, timing, crowd control, media coordination (if applicable) and post release monitoring. NMFS may require contingency plans should the release be unsuccessful including recapture of the animal following a specified time after release. Recapture will require special authorization from NMFS prior to this activity.

Generally for animals deemed “Nonreleasable” and with the approval from the NMFS Regional Administrator, the animal can be permanently placed in a public display or research facility or euthanized. If the animal is to be placed in permanent captivity, the receiving facility must hold an Exhibitors License from APHIS [7 USC 2131 et seq.] and comply with MMPA (16 USC 1374 Section 104(c)(7)). Once the Stranding Network Participant has received written notification from the NMFS Regional Administrator, they must send a *Transfer of Custody request letter* to the Office of Protected Species Permits, Conservation and Education Division ([http://www.nmfs.noaa.gov/pr/permits/mmpa\\_permits.htm](http://www.nmfs.noaa.gov/pr/permits/mmpa_permits.htm)) to permanently retain or request transfer to another authorized permanent facility. This should include a copy of the letter from the NMFS Regional Administrator concurring with the non-release decision (letter of concurrence from the Regional Administrator). As part of the decision making process for

permanent placement, NMFS staff may review APHIS records of compliance, qualification and experience of staff, transport, and placement plans (i.e., integration based on appropriate composition of species, sex and age and the intended proposed plan for public display or scientific research). An example transfer of custody request letter and NMFS concurrence letter has been provided in Appendix D. Also for nonreleasable animals, decisions for euthanasia are also to be discussed and approved by NMFS staff unless the obvious suffering of the warrants euthanasia before contact with NMFS is possible.

For FWS species, decisions regarding releasability of rehabilitated marine mammals are made by the FWS Field Offices and the FWS Division of Management Authority (see Appendix I for contact information) in conjunction with permit and letterholders. However, FWS also retains the authority to make the final determination on the disposition of these animals. If FWS determines that a marine mammal is non-releasable, the holding facility may request a permit for permanent placement in captivity as prescribed in MMPA 16 U.S.C. 1374 Section 104(c)(7) and Section 10(a)(1)(A) of the ESA species if the species is listed.

Manatee releases require a minimum 30-day advance notice (although exceptions may be made in the event of extenuating circumstances) and must also include a signed statement from the attending veterinarian that the **animal is medically and behaviorally suitable for release in accordance with the release criteria** (i.e., similar to a health certificate) and include a written release plan and timeline. Upon receipt, FWS will evaluate and approve the suitability of the release site and release conditions (see taxa specific sections for further guidance).

For cases involving declared *Marine Mammal Unusual Mortality Events*, the *Working Group on Marine Mammal Unusual Mortality Events* will be consulted to determine if event specific release standards should be implemented as stated in the **1996 NOAA Technical Memorandum – National Contingency Plan for Response to Unusual Marine Mammal Mortality Events**. Priority will be given to protecting the health of wild populations over the disposition of an individual animal. Provisions may require monitoring a representative subset of released animals to determine survivability impact on the affected population or holding rehabilitated animals beyond the projected release time to determine long term health effects.

### **C. Required Documentation for Rehabilitation and Release of Marine Mammals (see Figure 1)**

#### **1. NMFS**

Pursuant to the NMFS Stranding Agreement filed with NMFS that allows a stranding organization to respond to and/or rehabilitate marine mammals, Stranding Network Participants must provide documentation to NMFS regarding each of their activities that involve the taking and disposition of marine mammals as described below. The same holds true for actions under 109(h). See Figure 1 – Required documentation and procedures following submission of the written “release determination recommendation.”

- **Marine Mammal Stranding Report Level A Data**, NOAA form 89-864, OMB No. 0648-0178 (Appendix C)  
This report is mandatory for all stranding events and includes basic information regarding the site and nature of the stranding event, a statement that the animal was found alive or a description of the condition of its carcass, morphologic information, photo or video documentation, initial disposition of any live animal, tag data, and information on disposal, disposition, and necropsy of dead animals. This report must be sent to NMFS at the time stated in the NMFS Stranding Agreement.
- **Marine Mammal Rehabilitation Disposition Report**, NOAA form 89-878, OMB No. 0648-0178 (Appendix C)  
This report is mandatory for all rehabilitation cases (i.e., long term and short term temporary holding) and includes a brief history of the stranding and related findings of an individual marine mammal. It also includes the disposition of samples taken from the animal and disposition of the animal including release site and tagging information. This report includes verification and date that a pre-release health screen was done on the animal. This document must be sent to NMFS no later than 30 days following the final disposition (e.g. released or non-released) of the marine mammal or as prescribed in the NMFS Stranding Agreement. NMFS compiles these data annually to monitor success of rehabilitation and identify where changes and enhancements should be made.
- **Release Determination Recommendation 50 CFR Sec. 216.27 (a)(2)** (Appendix B)  
This regulation states that the custodian of a rehabilitated marine mammal must provide NMFS with written notification at least 15 days prior to the release of any marine mammal to the wild, including a release plan. The pre-notification requirement may be waived in writing for certain circumstances by the NMFS Regional Administrator in accordance with specific requirements as stated in the NMFS Stranding Agreement. The required notification (release determination recommendation) must provide information sufficient for determining the appropriateness of the release plan, including a description of the marine mammal with its physical condition and estimated age, the date and location of release, and the method and duration of transport prior to release (50 CFR 216.27(a)(2)(ii)). NMFS requests a signed report or statement from the attending veterinarian that the marine mammal is medically and behaviorally suitable for release in accordance with NMFS release criteria (i.e., similar to a health certificate under the Animals Welfare Act). NMFS may also require a concurrence signature from the “Authorized Representative” or Signatory of the Stranding Agreement. In the case of more challenging releases such as animals considered Conditionally Releasable,” requests for release should be submitted well in advance of the 15-day period to provide adequate time for review and planning. NMFS reserves the right to request additional information and impose additional requirements in any release plan to improve the likelihood of success or to protect wild populations (50 CFR Sec. 216.27 (a)(3)). NMFS also can order other disposition as authorized

upon receipt of the report (release determination recommendation) (50 CFR 216.27 (b)(2) and (b)). Sample letters have been provided in Appendix D.

- **Notification of Nonrelease/Transfer of Custody**

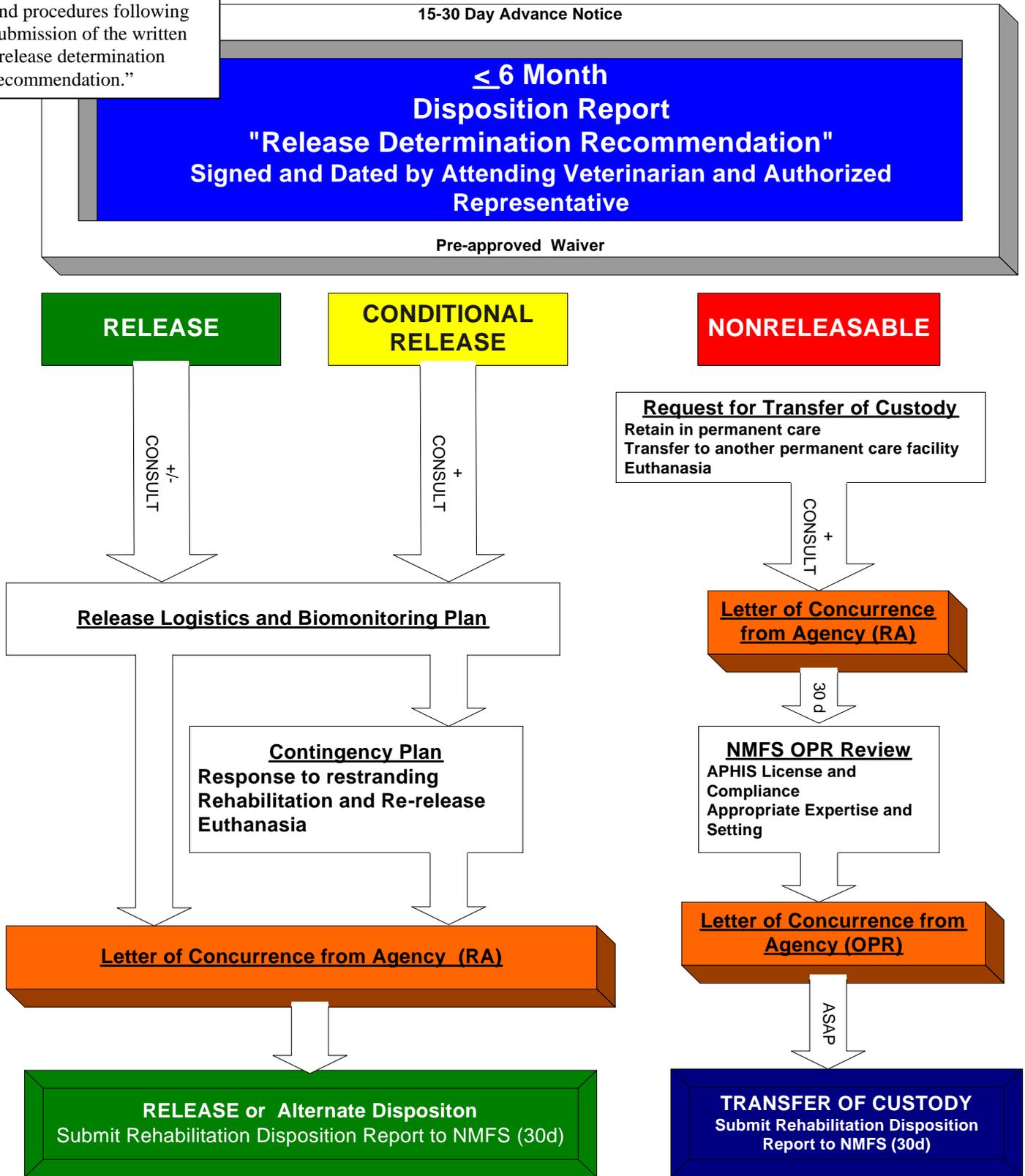
If the animal is to be placed in permanent care, the receiving facility must hold an Exhibitors license from APHIS [7 USC 2131 et seq.] and comply with MMPA (16 USC 1374 Section 104(c)(7)). Once the Stranding Network Participant has received written notification from the NMFS Regional Administrator (letter of concurrence), they must contact the Office of Protected Species Permits, Conservation, and Education Division ([http://www.nmfs.noaa.gov/pr/permits/mmpa\\_permits.htm](http://www.nmfs.noaa.gov/pr/permits/mmpa_permits.htm)) within 30 days to request a transfer of custody (to retain or transfer to another authorized facility). This request will require the letter from the NMFS Regional Administrator concurring with the non-release decision (letter of concurrence from the Regional Administrator). As part of the decision making process for permanent placement, NMFS staff may review APHIS compliance records, qualification and experience of staff, transport, and placement plans (i.e., integration based on appropriate composition of species, sex and age and the intended proposed plan for public display or scientific research). Once approved, the Stranding Network Participant and the receiving facility (could be same facility) will receive a letter of authorization for transfer of custody from NMFS OPR and the transfer should occur as soon as possible. Examples of a NMFS letter of concurrence and transfer of custody have been provided in Appendix D.

## **2. FWS**

Requirements for the rehabilitation and release of marine mammals under FWS jurisdiction are specified under individual permits or LOAs. These requirements are specific to the species, the organization, and the activity being conducted. An example of required documentation for manatee rescue, rehabilitation, and release activities is provided in Appendix C.

**Figure 1.**

Required documentation and procedures following submission of the written "release determination recommendation."



#### **D. Assessment Process for a Release Determination (See Figure 2 for Assessment Process)**

These guidelines provide an evaluative process to determine if a stranded wild marine mammal, following a course of treatment and rehabilitation, is suitable for release to the wild. The basic format for these guidelines provides assignments for each taxonomic group (e.g., cetaceans, pinnipeds, manatees, sea otters, walrus, and polar bears) of rehabilitated marine mammals into “Release Categories.” Release potential is characterized and categorized based on a thorough assessment of the health, behavior, and *ecological status* of the animal, as well as the release plan. It is critical that detailed historical, medical, and husbandry records are maintained and reviewed. Following a complete evaluation, the attending veterinarian and Assessment Team should categorize the animal into one of the following Release Categories: **Releasable**, **Conditionally Releasable**, **Conditionally Non-releasable (for manatees only)**, and **Nonreleasable**. Based on the findings from the Assessment Team, the attending veterinarian provides a recommendation on releasability to NMFS or FWS. The Agencies will review and consider this information as a part of the release determination review process.

In most release cases, NMFS requires release of marine mammals within six months of admission to rehabilitation (50 CFR 216.27(a)). This assessment can be done at more frequent intervals or earlier in the process of rehabilitation such as for obvious nonrelease cases (e.g., neonatal cetaceans, blind or deaf animals, etc). Rather than staying in a rehabilitation situation for up to six months, it may be in the best interest of the animal to immediately assess, determine releasability and transfer to a more suitable permanent care facility. This is particularly important for animals that need socialization or expert care.

**The Assessment should include the following steps and general parameters (see Figure 2 on page 24):**

- 1. Historical Assessment.** The Assessment Team should complete a historical evaluation that includes information from the time of stranding through the duration of rehabilitation. Such information can impact the management of the case and determination of release. The following circumstances should be documented: an ongoing epidemic among other wild marine mammals, presence of environmental events such as a harmful algal bloom or hazardous waste spill, acoustic insult, and special weather conditions (e.g., El Nino, hurricane, extreme cold, extreme heat, changes in oceanographic parameters, etc). It should be noted if the animal has previously stranded and been released, if the animal was part of an official Marine Mammal Unusual Mortality Event, if the animal had been exposed to other wild or domestic animals just prior to and/or during rehabilitation or if the animal had attacked and/or bitten a human while being handled. This assessment should also include if the animal is evidence and part of a *human interaction* or criminal investigation. Such information can help guide the diagnostic and treatment strategy during rehabilitation and may impact the plan for post-release monitoring. It should be noted that strict measures are to be in place to prevent any disease transmission from other wild and domestic animals and humans during the rehabilitation process. Other considerations that should be taken into account include whether the animal was transferred from another facility (i.e., short-term

triage/holding facility or rehabilitation facility) and the quality of care and treatment of each rehabilitation facility.

**2. Developmental and Life History Assessment.** In order to be deemed “Releasable,” all rehabilitated marine mammals must have achieved a developmental stage wherein they are nutritionally independent or released with their mothers. **Nursing animals should not be released in the absence of their mothers.** The ability of a young marine mammal to hunt and feed itself independently of its mother is critical to successful integration into the wild. Also of great importance is achievement of a robust body condition such that the animal has adequate reserves for survival. Other developmental issues such as reproductive status and advanced age seldom stand alone as determinants of release candidacy but are evaluated in conjunction with the overall health assessment. The Assessment Team should seriously consider information concerning the natural life history for the species; therefore, it is important that the makeup of the team include someone with expertise or working understanding of the species behavior and life history. Important questions to be addressed include: 1. does the species depend on a social unit for survival or does it exist solitarily in the wild, 2. has the animal developed the skills necessary to find and capture food in the wild, 3. has the animal developed the social skills required to successfully integrate into wild societies, 4. is there knowledge of their home range or migratory routes, and 5. does the animal have skills in predator recognition and avoidance. In other words, how important is it to the survival of the animal to be released with or near other cohorts. The Assessment Team can work with NMFS to consult with outside experts to evaluate the animal and address these questions. Greater details regarding developmental assessment are included in the appropriate section for each taxonomic group.

**3. Behavioral and Ecological Assessment and Clearance.** In order to be deemed “Releasable,” a marine mammal must meet basic behavioral criteria and some of which are specific for taxa. Across taxonomic groups, behavioral requirements for release include demonstration of normal breathing, swimming, and diving with absence of aberrant (i.e., abnormal) behavior, auditory, and/or visual dysfunction that may significantly compromise survival in the wild and/or suggest diseases of concern. The rehabilitated animal must also demonstrate the ability to recognize, capture, and consume live prey prior to its release when access to live natural prey is feasible, or, in the case of manatees, the ability to identify and feed on appropriate forage types. Because abnormal behavior may reflect illness or injury, this should be done in concert with the attending veterinarian and the medical assessment. The **“behavioral clearance”** should be part of the overall recommendation for release that is passed on to NMFS or FWS. Outstanding concerns regarding the behavioral suitability of the marine mammal for release are to be discussed with NMFS or FWS. Additional information is included in the behavioral assessment section for each taxonomic group.

Also included in this thought process, is the concept of **“ecological status.”** This concept attempts to integrate the medical and behavioral evaluations into an extrapolation of how the animal would likely do in the wild when exposed to typical ecological pressures (personal communication Wells 2005). It goes beyond the assessment of the current condition of the animal in an artificial environment of temporary captivity at the

rehabilitation facility relative to a limited set of immediately observable or measurable parameters. It places the animal in its current rehabilitated condition in the context of everyday life in the wild. This process recognizes the importance of a team approach, involving complementary expertise, to evaluate the probability that a rehabilitated animal will survive and thrive back in the wild. It would be useful to include in the deliberations an expert such as a behavioral ecologist with knowledge of the species specific (or closely related species) solutions to ecological challenges in the wild, who is familiar with the habitat including oceanographic parameters, ranging patterns, life history, feeding ecology, potential predators, social structure, and anthropogenic threats likely to be faced by the animal once it is released.

**4. Medical Assessment and Clearance.** Although this document focuses on the evaluation and preparation of rehabilitated marine mammals for release, the medical assessment spans the entire time the animal is in rehabilitation and is critical to understanding the animal's health prior to release. The medical assessment includes information related to any diagnostic testing, treatment, and response to treatment. The attending veterinarian should perform a hands-on physical examination upon admission and prior to the release determination. The attending veterinarian should review the animal's complete history including all stranding information, diagnostic test results (i.e., required by NMFS or FWS), and medical and husbandry records. The goal of required testing requested by NMFS or FWS is to safeguard the health of wild marine mammal populations and this is achieved by testing for diseases (*reportable diseases*) that pose a significant morbidity or mortality risk to wild populations. Other reportable diseases include those that are of *zoonotic or public health and safety concern* and the agencies will require immediate notification to assure proper protocols are put into place. The agencies may request testing for other *emerging diseases* as part of a *surveillance program* to identify potential *epidemics of concern* or to determine health trends. Additional testing will be required if the animal was part of an official Marine Mammal Unusual Mortality Event. Specific testing requirements (i.e., pre-release health screen) will come from the NMFS Regional stranding coordinator through the Marine Mammal Health and Stranding Response Program and follows the term and responsibilities stated in the NMFS Stranding Agreement. For FWS species, contact the appropriate Field Office for guidance (see Appendix I for contact information).

Throughout the rehabilitation period, the frequency of physical exams and decisions for performance of additional diagnostic testing are determined by the attending veterinarian. The animal must be closely monitored for disease throughout rehabilitation. Regardless of the precise cause of the animal's stranding, the stranding event itself and the animal's abrupt transition to a captive environment can cause significant stress, which may increase its susceptibility to disease. (St. Aubin, D.J. and, L.A. Dierauf 2001). The rehabilitation facility may also harbor pathogens not encountered in the wild or new antibiotic resistant strains (Stoddard et al 2005). Should the animal become infected with such a pathogen during rehabilitation, it could become ill or become a carrier of that pathogen and may pose a threat to a naïve wild population or even public health if it is released. Introduction of pathogens from rehabilitated animals to free-ranging wild animals is a significant concern for diseases with serious *epizootic or zoonotic* potential. (Gilmartin et al., 1993, Griffith et al., 1993,

Spalding and Forrester,1993). Pathogens, particularly viruses, bacteria and some protozoans, can quickly replicate in their hosts and are susceptible to selective forces that can drive microbial adaptation and evolution leading to changes in transmission rates, virulence, and pathogenicity via genetic modification (Ewald 1980, 1983, 1994,; Su et al. 2003). Thus, infectious agents may become more pathogenic as they pass through new individuals and naïve species.

The attending veterinarian is urged to utilize the full spectrum of diagnostic modalities available for health assessment of the animal. In addition to basic blood work, serology, microbial culture, cytology, urinalysis, and fecal exam, advanced techniques for pathogen detection such as Polymerase Chain Reaction (PCR), microarrays, and toxicology techniques are also available. A number of imaging techniques including radiology, bronchoscopy, and laparoscopy may also be utilized. The marine mammal literature has expanded to include numerous references on the performance and interpretation of diagnostic tests.

Except as otherwise noted, acquisition of blood for a complete blood count (CBC) and chemistry profile plus serum banking may be required by NMFS and FWS upon admission of a marine mammal to a rehabilitation facility. Such blood work should to be repeated by the original laboratory to avoid problems with inter-laboratory variability prior to release of the marine mammal. Microbial culture and isolation (aerobic and anaerobic bacterial, viral, fungal) should be a part of the medical evaluation and done upon admission and before exit from rehabilitation centers. Such paired tests help determine the types of pathogens that a marine mammal may have acquired in the wild and those that may have been acquired during its rehabilitation. This testing will be required for each cetacean entering a rehabilitation facility. Because the number of pinnipeds entering a rehabilitation facility annually may be quite high and presenting with similar diagnosis, particularly in El Nino years, NMFS may waive a thorough clinical evaluation as mentioned above for each pinniped but instead require that a percentage of these animals entering a facility have a through clinical work-up. This will be dependent on several factors such as the stranding location, time of year, the clinical diagnosis upon admission, and disease status of the wild population (e.g., ongoing outbreaks, Marine Mammal Unusual Mortality Events, etc). For walrus and polar bears, testing requirements will be on a case-by-case basis. The NMFS or FWS stranding coordinator can provide guidance on this and other recommendations mentioned above.

The attending veterinarian interprets the results of blood work and additional diagnostic tests in light of physical exam findings, the animal's age, reproductive status, molt status, and other relevant or historical factors. Circumstances surrounding the stranding, recent environmental events, known health issues of resident wild marine mammals, and exposure to other animals are examples of historical factors that may provide information regarding the health status of the stranded marine mammal. The attending veterinarian should also consider if the animal was held in close proximity to other animals (e.g., penmates) undergoing rehabilitation and the disease history of those animals (e.g., within facility transmission). A number of references provide data useful for the interpretation of marine

mammal diagnostic tests. Appendices E, F, G and H provide information on diseases of concern for cetaceans, pinnipeds, manatees and sea otters.

## 5. Release Logistics

**a. Required Identification Prior to Release.** Marine mammals must be marked for long term individual identification in the wild prior to release (50 CFR Sec. 216.27(a)(5)). Examples of identification systems include flipper roto tags, flipper All-Flex tags, Flipper Temple tags, passive integrated transponder tags (PIT tags), radio tags, and freeze branding. Invasive procedures should be done under the direct supervision of the attending veterinarian and will need prior approval from NMFS and FWS. Proper photo identification can also be considered part of this protocol. Standard identification protocols exist for various groups of marine mammals that detail the methods and procedures for marking for future identification in the wild, and are included in the appropriate section for each taxonomic group. Contact the Agency stranding coordinator for more direction on tagging.

As described, roto tags or flipper tags (basic tags) for cetaceans and pinnipeds (except walrus) are to be obtained from or coordinated through the NMFS Regional Stranding Coordinator. For FWS species, tags for walrus are to be obtained from the *USGS* and tags for polar bears are obtained from FWS. Tags for manatees are to be obtained from FWS or the appropriate *State Agency*. Tags for sea otters are obtained by each individual LOA or permit holder.

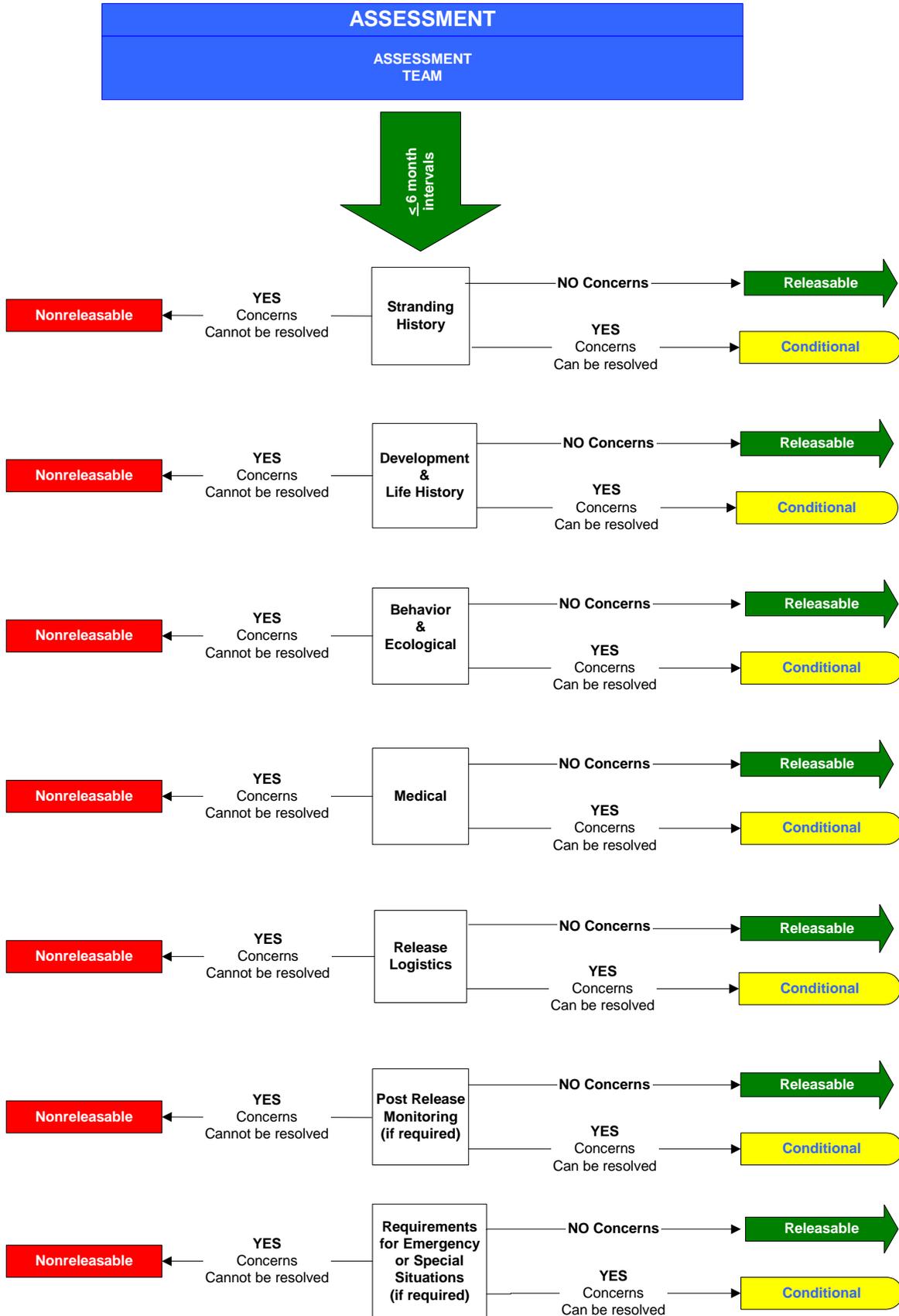
Depending on the species, if the animal restrands or the tag is found, this information should be reported to the appropriate NMFS or FWS/USGS Stranding Coordinator. The recent rollout of the NMFS National Marine Mammal Stranding Database does centrally archive tag data for NMFS species. The FWS and/or USGS track these data for walruses, sea otters, and polar bears. For manatees, the State agencies maintain the tag data.

**b. Release Site Requirements and Recommendations.** Rehabilitated marine mammals are to be released to the wild under circumstances that reflect the natural history of their species and maximize the likelihood for their survival. This will vary with age and sex of the individual. Timing should be set to minimize additional energetic and social demands and maximize foraging success and ease of social acceptance with conspecifics. For NMFS species, information regarding the date, location, and logistics of the release and any other information requested are included in the required 15-day advance notification of the Agency prior to release as cited in 50 CFR Sec. 216.27 (a)(2). Key factors in determining a release site include specific geographic and environmental factors such as weather, past successful releases, public use, potential for predators, and availability of prey as well as transport time. Maintenance of stock fidelity, proximity of conspecifics, timing in relation to breeding seasons and migration activities are also crucial considerations. As the natural history of each species provides the framework for planning a release, greater details for each taxonomic group are provided in the appropriate section of this document.

**6. Post-Release Monitoring.** Post-release monitoring is a key method by which the efficacy of rehabilitation efforts can be assessed and revised. Such monitoring may also provide an opportunity to recover individuals that are unable to readjust to the wild. Simple post-release monitoring plans include such methods as visually tracking tagged or marked animals by land, air, or sea. Although more costly, radio-telemetry and satellite tracking are highly desirable methods of post-release monitoring as they provide detailed information of the movement and behavior of released marine mammals. Post-release monitoring is recommended for all rehabilitated marine mammals and is required for some taxonomic groups such as cetaceans and manatees depending on "release category." The intensity of post-release monitoring efforts is determined by such factors as the age and species of the marine mammal, its status as threatened or endangered, and concerns regarding its health or developmental issues that may impact its ability to readjust to the wild. Advanced post-release monitoring techniques may be required for "Conditionally Releasable" animals when significant concerns regarding their chances of survival exist. All post-release monitoring plans for rehabilitated marine mammals are to be approved in writing by and coordinated with NMFS or FWS. NMFS may require the submission of follow-up monitoring summaries at specified intervals post-release (e.g., 90 day intervals), until such time as contact with the animal has ended. The final update should include tracking data and an evaluation of the success of the rehabilitation and release along with recommendations for future cases. NMFS may use these data in order to make future revisions to marine mammal rehabilitation and release guidelines. In order to compare individual cases, standardization of data collection protocols for monitoring released animals may be helpful. Formal study of monitoring data and its dissemination to the stranding network will aid in the assessment of marine mammal rehabilitation and release programs.

**E. Emergency or Special Situations.** NMFS and FWS are responsible for monitoring and protecting the health of wild marine mammal populations. In order to fulfill this responsibility and as stated in the NMFS Stranding Agreements, these agencies may require or recommend increased documentation, testing, and/or post-release monitoring of rehabilitated marine mammals when a stranding event appears to be related to wide spread environmental events such as algal blooms, hazardous waste spills, outbreaks of disease, Marine Mammal Unusual Mortality Events, etc. An increased incidence of illness or injury to marine mammals may prompt NMFS or FWS to require specific diagnostic testing as part of a surveillance program of stranded animals and additional communication regarding case outcomes. NMFS and FWS personnel are to provide Stranding Network Participants and rehabilitation facilities with this information and may be able to provide additional funding and other support regarding such circumstances. For example, NMFS holds contracts with specific diagnostic labs that can provide services for rehabilitation facilities free of charge.

**Figure 2. Assessment process for determining releasability.**



## IV. GUIDELINES FOR RELEASE OF REHABILITATED CETACEANS

### A. Introduction

Few species of cetaceans (generally odontocetes) are rehabilitated in the United States each year. Although the natural history of cetacean differ among species, the general release criteria set forth in this document are applicable to all cetaceans in the United States. NMFS oversees rehabilitation and release of all cetacean species. Prior to release, NMFS requires that a thorough evaluation of the historical, developmental, behavioral, and medical records and status be completed by the Assessment Team (i.e., Stranding Network Participant, attending veterinarian, animal care supervisor, and biologist with knowledge of species behavior, ecology, and life history). For all cetacean cases, a release determination recommendation must be sent to the NMFS at least 15 days (typically 30 day advance notice) in advance of a proposed release date. Waivers for advanced notice will not be considered in cetacean cases. The release determination recommendation must include a signed statement from the attending veterinarian in consultation with his or her Assessment Team that the animal is **medically and behaviorally suitable for release in accordance with the release criteria** and include a written release plan and timeline. The request should also include a statement(s) from an expert biologist(s) with knowledge of the species or similar species that is being considered for release and should state that the animal meets behavior and ecological criteria for release in accordance with the release criteria. NMFS may recommend or require additional testing beyond these guidelines for reportable diseases in light of new findings regarding various disease and health issues. A release plan will require a justification statement and detailed description of the logistics for transporting, tagging, location, timing, crowd control, media coordination (if applicable), post release monitoring, and recovery should the animal fail to thrive. NMFS may require recapture if the animal appears to be in distress or poses a risk following a specified time after release. Recapture will require special authorization from NMFS prior to this activity. NMFS may consult with individual experts for further guidance. NMFS reserves the right to impose additional requirements in the release plan as stated in 50 CFR 216.27 (a)(3).

### B. Overview of “RELEASE CATEGORIES” for Cetaceans

As further detailed in this chapter, cetaceans evaluated at rehabilitation facilities should fit into one of three “RELEASE CATEGORIES:”

1. **“RELEASABLE”**: There are no significant concerns related to likelihood of survival in the wild and/or risk of introducing disease into the wild population. Also, the animal meets basic historical, developmental, behavioral, ecological, and medical release criteria. The release plan (post-release identification, release site, and post-release monitoring) has been approved in writing by NMFS via a letter of concurrence.
2. **“CONDITIONALLY RELEASABLE”**: There are concerns about the historical, developmental, behavioral, ecological, and/or medical status of the animal raising a question of survival or health risk to wild marine mammals. A cetacean may be deemed conditionally releasable if requirements for release cannot be currently met but may be met in the future

without compromising the health and welfare of the individual animal. In such cases, more time may be needed to determine the feasibility of release (see 50 CFR 216.27(a)(1)(iii)).

All “Conditionally Releasable” cetaceans must be discussed with NMFS. NMFS may consult with individual experts to discuss specific cases. Experts include scientists and veterinarians with expertise in cetacean biology and medicine (particularly experts with species-specific knowledge). Such discussions will clarify the most appropriate disposition. For example, additional medical testing, rehabilitative therapy, and strategies for post-release monitoring may be required to release a “Conditionally Releasable” cetacean.

3. **“NON-RELEASABLE”**: There are significant historical, developmental, behavioral, ecological, and/or medical concerns regarding its release to the wild. It has a documented condition demonstrating little chance for survival in the wild and/or a diagnosed health risk to wild marine mammals. This category also includes animals that have been in rehabilitation greater than two years (see 50 CFR 216.27(a)(1)(iii)). Additionally, a cetacean may be deemed “Non - Releasable” if an appropriate release site or post-release monitoring plan cannot be arranged.

If the animal is to be placed in permanent care, the receiving facility must hold an Exhibitors License from APHIS [7 USC 2131 et seq.] and comply with MMPA (16 USC 1374 Section 104(c)(7)). Once the Stranding Network Participant has received written notification from the NMFS Regional Administrator (letter of concurrence), they must contact the Office of Protected Species Permits, Conservation, and Education Division ([http://www.nmfs.noaa.gov/pr/permits/mmpa\\_permits.htm](http://www.nmfs.noaa.gov/pr/permits/mmpa_permits.htm)) within 30 days to request a transfer of custody (to retain or transfer to another authorized facility). This request will require the letter from the NMFS Regional Administrator concurring with the non-release decision (letter of concurrence from the Regional Administrator). As part of the decision making process for permanent placement, NMFS staff may review APHIS compliance records, qualification and experience of staff, transport, and placement plans (i.e., integration based on appropriate composition of species, sex and age and the intended proposed plan for public display or scientific research). Once approved, the Stranding Network Participant and the receiving facility (could be same facility) will receive a letter of authorization for transfer of custody from NMFS OPR and the transfer should occur as soon as possible. Examples of a NMFS letter of concurrence and transfer of custody have been provided in Appendix D.

### C. Historical Assessment of Cetaceans

Historical stranding information may guide the management of rehabilitation and the plan for post-release monitoring. Important historical information should include:

1. **A record of previous stranding** – Cetaceans that have previously stranded and released, and subsequently strand again, are deemed “Conditionally Releasable” pending consultation with NMFS. Such animals must be reassessed and as they may have underlying health issues requiring additional evaluation, diagnostic testing and advanced post-release monitoring. Alternatively, such cetaceans may

be assessed as “Non-Releasable” and be transferred to permanent captivity or euthanized.

2. **A mother-calf pair** – A stranding of a mother/calf pair may be the result of illness or injury to either the mother or calf or both. If the calf dies or is euthanized, the mother may be conditionally releasable. If the mother survives she may be conditionally releasable to her known social group or with conspecifics if deemed appropriate by a panel of experts. If the mother dies or is euthanized, the calf is likely non-releasable as it is dependent and cannot forage on its own and should be placed in permanent captivity or euthanized.
3. **An association with an ongoing epidemic among other wild marine animals or a Marine Mammal Unusual Mortality Event** - If the stranding of a cetacean occurs in close temporal or geographic proximity to an ongoing epidemic or Unusual Marine Mammal Mortality Event, fish kill, harmful algal bloom, hazardous waste spill, or other such environmental event, the cetacean is deemed “Conditionally Releasable” and consultation with NMFS is required. The agencies may request additional testing, documentation, and/or post-release monitoring of such cetaceans.
4. **Stranding location and active/ home range** - Areas that may require additional assessment related to increased human activity (e.g. active fishery, increased recreational use, military activity, shipping activity, etc.) or hazardous environmental conditions (e.g., harmful algal bloom or hazardous waste spill, and/or special weather conditions like El Nino, hurricane, extreme cold, extreme heat, etc). Information on areas of human activity and environmental hazards is also vital for determining an appropriate release site.
5. **Exposure to (or injury from) other wild or domestic animals** – Cetaceans with a history of exposure to terrestrial wild or domestic animals are deemed “Conditionally Releasable” and must be discussed with NMFS. Should a rehabilitating cetacean contract such a pathogen, it could transmit the illness to its wild cohorts. Such transmission of pathogens can occur even when a rehabilitated cetacean is not showing clinical signs of disease. Consultation with NMFS is thus required for cetaceans that have a history of exposure to terrestrial animals.
6. **Was transferred from another holding, triage or rehabilitation facility** – The opportunity for exposure to pathogens can occur at different stages of response and rehabilitation; therefore, it is important to obtain medical records and document the quality of care and treatment at each stage of this process.
7. **Is evidence or part of a human interaction or criminal investigation;**
8. **Part of a Mass Stranding (stranding involving more than one cetacean if not a cow-calf pair)** – Mass strandings are typically influenced by behavior with the

majority of animals stranding healthy but in need of assistance to return to the ocean. If a stranding response can be mounted quickly and safely and the animals are assessed and deemed healthy, individuals of a mass stranding may be relocated for immediate release. However, some individuals may be admitted into rehabilitation and may be conditionally releasable based on the pathologic findings of the pod mates that perished during the event.

#### **D. Developmental Assessment of Cetaceans**

A fundamental criterion for developmental clearance of a rehabilitated cetacean is that it has attained a sufficient age to be nutritionally independent, including the ability to forage and hunt. The cetacean calf grows from a state of total nutritional dependence through nursing to partial maternal dependence as it learns to forage for fish and/or squid. Eventually the young cetacean achieves total nutritional independence and forages completely on its own. Factors including individual and species variations, rehabilitation practices, health status plus environmental factors affect the rate at which such development occurs (see Appendix J for Developmental Stages by Cetacean Species). For *Tursiops truncatus*, the age at which a calf may be completely weaned is approximately 1-4 yrs. Calves that are nutritionally dependant at the time of admission to rehabilitation are automatically placed in the “Conditionally Releasable” category and must be discussed with NMFS. In situations where a nursing calf strands with its mother and both animals achieve medical, behavioral and ecological clearance, the calf must be released with its mother. Very young nursing calves that strand alone or whose mothers die may lack socialization and basic acquired survival skills as they grow older. Neonatal and very young nursing calves will be deemed “Non-Releasable.” Cases involving older calves and juveniles having some foraging skills must also be discussed with NMFS. With thorough assessment and optimum plans for release and subsequent monitoring, some of these older calves and young juveniles may be “Conditionally Releasable.”

Reproductive status in and of itself does not impact release candidacy unless a female strands with its calf or gives birth during rehabilitation. For instance, a single pregnant female should be returned to the wild as soon as both medical and behavioral clearance have been achieved and NMFS approves of the release plan. However, all mother-calf cetacean pairs are deemed "Conditionally Releasable" and must be fully discussed with NMFS and its advisors. The well-being of both the mother and the calf is to be carefully considered in such cases. Efforts must be made to reduce their time in captivity and to keep the mother-calf pair together, yet allow for continued treatment and rehabilitation of either or both individuals if warranted by medical conditions.

Cases involving cetaceans showing signs of advanced age must also be discussed with NMFS. Although it is not always feasible to precisely determine the age of a living adult cetacean, the physical condition of the animal may suggest to the Assessment Team that it is geriatric. Geriatric animals may have underlying clinical conditions that contributed to their stranding or may be behaviorally or ecologically unsuited for continued life in the wild. Thus, these animals should be deemed Conditionally Releasable and thoroughly evaluated.

#### **E. Behavioral Assessment of Cetaceans**

Complete assessment of the behavior and ecological potential may be limited by the confines of a temporary captive environment and behavior of the animal will differ from that displayed in the wild. A full understanding of what constitutes “normal” for a given cetacean species also may be lacking. Behavioral and ecological clearance is thus founded on evaluation of basic criteria necessary for the survival of the animal in the wild. Behavioral evaluation often overlaps with medical evaluation as abnormal behavior may indicate an underlying disease process. Experts with species specific knowledge of cetacean behavior and ecology, in addition to the attending veterinarian, should each assess the behavior of the rehabilitated cetacean. These assessments should involve closely evaluating and documenting behavior throughout rehabilitation (i.e. *ethogram*), relating the behavioral, sensory, and physical capabilities of the animal to its prospects of surviving and thriving in the wild.

To achieve basic behavioral clearance, a cetacean must breathe normally (including rate, pattern, quality, and absence of respiratory noise), swim and dive effectively without evidence of aberrant behavior, auditory, or visual dysfunction that may compromise its survival in the wild or suggest underlying disease that may threaten wild marine mammals. Behavioral clearance also should include confirmation that the cetacean is able to recognize, capture, and consume live prey when such tests are practical (for example, it may not be possible to obtain live prey for offshore or deep water species). Documented dependency on or attraction to humans and human activities in the wild would warrant special consideration as a possible conditional release or non-release decision.

Basic behavioral conditioning of wild cetaceans for husbandry and medical procedures may be necessary during rehabilitation as long as every effort is made to limit reinforced contact with humans. Station training may be necessary to assure animals are appropriately fed and to control social dominance when multiple animals are being treated in the same pool or pen. Also, such conditioning may reduce stress for the animal during examinations and acquisition of biological samples. Behavioral conditioning of cetaceans is to be done for the shortest time necessary to achieve rehabilitation goals and is to be eliminated prior to release such that association of food rewards with humans is diminished. Additional information on behavioral conditioning of marine mammals is provided in the references.

### **1. Breathing, Swimming and Diving**

The Assessment Team should evaluate respiration to determine that the animal does not exhibit abnormal breathing patterns or labored breathing. Respiratory measurements should be standardized to record the number of breaths per five-minute intervals. Evaluation of swimming and diving must confirm that the cetacean moves effectively and does not display abnormalities such as listing, difficulty submerging, asymmetrical motor patterns, or other potentially disabling conditions. In small pools (i.e., less than 50ft diameter), cetaceans may not be able to demonstrate a full range of locomotor and maneuvering abilities; therefore, evaluation in larger pools is highly recommended. Cetaceans exhibiting persistent abnormalities of breathing, swimming, or diving, are to be considered “Conditionally” or “Nonreleasable” and must be discussed with NMFS. Medical records should document the level of organ evaluation, such as

thoracic x-rays, ultrasound, bronchoscopy, etc. Discussions of releasability by the Assessment Team should be based on these records.

## **2. Aberrant Behavior**

The behavioral clearance of the cetacean should include confirmation that the animal does not exhibit aberrant behavior. Examples of aberrant behavior include but are not limited to regurgitation, head pressing, postural abnormalities such as repetitive arching or tucking, decreased range of motion, abnormal swimming or breathing as described above or excessive interest in interaction with humans. Cetaceans displaying abnormal behavior may have an underlying disease process or may have permanent injury or tendencies that will decrease their chance of survival in the wild. Cetaceans displaying aberrant behavior are considered “Conditionally Releasable” or “Nonreleasable” and thus are to be reported to and fully discussed with NMFS.

## **3. Auditory and Visual Acuity**

The behavioral and ecological clearance of the cetacean should include evaluation of auditory and visual acuity. Auditory dysfunction, involving production or reception of typical sounds or signals occurring in the wild, may be a reflection of active disease, permanent injury, or degenerative changes associated with aging. Evaluators may suspect that a cetacean has compromised auditory function if it appears to have difficulty locating prey items or various objects via echolocation or if it minimally responds to novel noises. In each case, it is highly recommended that hydrophone-recording systems with an appropriate frequency response be used to record sound production by the cetacean to document production or normal classes and qualities of sounds. It is required that cetaceans assessed as having compromised auditory function be discussed with NMFS, as reduced auditory abilities can compromise the ecological functionality and social abilities of some species, thus reducing the probability of survival in the wild. Additional diagnostic testing such as evoked auditory potential may be necessary to further evaluate the animal and this requires approval and coordination with NMFS. Cetaceans having discoloration, swelling, abnormal shape, position or appearance of the eye or eyelids may have visual dysfunction and also require discussion with NMFS.

## **4. Prey Capture**

The rehabilitated cetacean should demonstrate foraging behavior (i.e., the ability to hunt and capture live prey) prior to its release when practical. Consumption of solid food should also be part of the medical assessment (able to swallow and free of pharyngeal and/or gastrointestinal abnormalities). Prey items normally found in the animal’s environment and of good quality should be used whenever possible. Natural prey items may not be available for rehabilitating pelagic cetacean species; evaluators may try to utilize other prey species. However, many cetaceans often will not consume non-prey species. For social species, it may be just as important to look for cooperative or coordinated feeding behavior. NMFS should be notified if a rehabilitated cetacean appears compromised in its ability to recognize and/or capture live prey or if logistical issues preclude assessment of this behavior.

Cetaceans that are believed to have had limited foraging experience prior to stranding (i.e., young juveniles) require particularly careful assessment of prey capture ability. This behavior is learned and cetaceans that strand at a young age may not have gained adequate foraging skills to sustain themselves in the wild. Also, knowledge of the natural history of the species may be useful. If the species forages and hunts as a social unit, this may affect its ability to survive in the wild if released as a solitary animal. Similarly, amputated appendages may preclude the use of some specialized feeding techniques or attainment of sufficient speed or maneuverability for prey capture, or diminished auditory function may prevent individuals that prey on soniferous (i.e., noise-producing) fishes from locating sufficient prey to survive (e.g., coastal bottlenose dolphins).

### **5. Predatory Avoidance**

Testing a cetacean's ability to avoid predators is not practical in most cases, but indirect evidence of abilities can be evaluated. If the individual is determined to have stranded primarily as a direct result of a shark attack (as opposed to secondarily, as an attack on an otherwise compromised animal), then this suggests that the animal may lack the skills or physical abilities to continue to survive in the wild. This would be especially important in the case of young animals, recently separated from their mothers. For social species, observations of group behavior may indicate the cohesiveness of the group.

### **6. Social Factors**

The survival of an individual cetacean may be critically dependant on social organization and conspecifics (see Appendix J for Cetacean Species Specific Group Occurrence). A tremendous range of variability of sociality exists across the cetaceans. Members of species involved in mass strandings (i.e., presumably a social species) should not be rehabilitated singly or in unnatural groups (e.g., a group of neonates without their mothers). The composition of these groups should be carefully considered when animals are recovered from a stranding. It would be naïve to assume that any two cetacean species can be put together to form a functional social unit or that even two unfamiliar members of the same species will bond into a functional social unit. Therefore for social species, it is important to assess the group dynamics and behavior (*reasonable social group*) in the same manor as for individuals. Cetaceans that do not live in social groups do not necessarily require conspecifics for release, as long as they are released into an appropriate habitat where conspecifics are likely to occur. Indications of social problems that may be a contributing factor or direct cause of the stranding (e.g., evidence of extensive fresh tooth raking marks in the absence of other medical factors) should be considered. Medical concerns related to dentition, appendages, or hearing and sound production capabilities may be missing tools for socialization and require special consideration.

### **F. Medical and Rehabilitation Assessment of Cetaceans**

The medical assessment includes information related to any diagnostic testing, treatment, and response to treatment. The attending veterinarian should perform a hands-on-physical examination upon admission and prior to the release determination. The attending veterinarian should review the animal's complete history including all stranding information and diagnostic

testing (i.e., required by NMFS and any additional data), and medical and husbandry records (including food consumption and weight and length progression). The primary goal of the testing required by NMFS is to determine the risk to the health of wild marine mammal populations. This is achieved by testing for diseases that pose a significant morbidity or mortality risk to wild populations (i.e., reportable diseases). Those that are zoonotic or public health and safety concern require immediate NMFS notification to assure proper protocols are put into place. Additional testing will be required if the animal was part of an official Marine Mammal Unusual Mortality Event. NMFS may request testing for other emerging diseases as to support surveillance for potential epidemics of concern and to monitor changes in disease status due to rehabilitation practices. The directive for the pre-release health screen will come from the NMFS Regional Stranding Coordinator through the Marine Mammal Health and Stranding Response Program. Appendix E lists diseases of concern for cetaceans.

A complete health screen must be completed upon admission and just prior to release including basic blood collection for a CBC, chemistry profile (Chem-12 including BUN and creatinine, enzymes and electrolytes), serology, microbial and fungal culture (i.e., blow hole, rectal, and lesions), cytology, urinalysis, and fecal exam. If the animal is female and at reproductive age, it is advisable that pregnancy be ruled out prior to prescribing potentially fetal toxic medication. Serum (3ml) should be banked at the time of admission and just prior to release for retrospective studies. Cessation of antibiotics should occur two weeks prior to release examination to assure that the animal is no longer dependant on the medication and that the drug has cleared based on the pharmacokinetics and requirements made by the veterinary community and the Food and Drug Administration. Some antibiotics clear the body quickly and require shorter withdrawal time; therefore, when this recommendation cannot be met seek advice from NMFS. The veterinarian must provide written notification to the NMFS Regional Stranding Coordinator that a health screen and assessment of the cetacean scheduled to be released has been performed. The notification must also include the final release plan and a plan for hands-on physical examination by the attending veterinarian (including last blood draw and evaluation) within 72 hours of its release. The required documentation and signed release determination recommendation will be part of the administrative record along with the signed (by the NMFS Regional Administrator) letter of concurrence approval for release.

It is of extreme importance that the cetacean be monitored closely for disease throughout its rehabilitation. Regardless of the stranding etiology, handling and care can cause significant stress increasing susceptibility to disease. If not properly managed, rehabilitation facilities provide an environment where genetically altered or novel pathogens not typically encountered in the wild can easily be transmitted from animal to animal. This scenario can be problematic when an animal is exposed and becomes a carrier of that pathogen to a naïve wild population if released. Introduction of pathogens from rehabilitation centers to the wild is a significant concern as diseases with serious epizootic potential have previously been detected (Stoddard et.al. 2005). Infectious agents may become more pathogenic as they pass through new individuals and naïve species or become genetically altered from indiscriminant use of antibiotics.

The attending veterinarian is urged to utilize the full spectrum of diagnostic modalities available for health assessment of the cetacean. In addition to basic blood work, serology, microbial and

fungal culture (i.e., blow hole, rectal, and lesions), cytology, urinalysis, and fecal exam, advanced techniques for pathogen detection such as PCR and toxicology analyses are available. A number of diagnostic imaging techniques including radiology, CAT scans and MRI may be used as well as bronchoscopy and laparoscopy. The cetacean literature has expanded to include numerous references on the performance and interpretation of diagnostic tests.

Both agencies may request testing for other *emerging diseases* as part of a *surveillance program* to identify potential *epidemics of concern*. Additional testing will be required if the animal was part of an official Marine Mammal Unusual Mortality Event. Specific testing requirements (i.e., pre-release health screen) will come from the NMFS Regional stranding coordinator through the Marine Mammal Health and Stranding Response Program and follows the term and responsibilities stated in the NMFS Stranding Agreement.

### **G. Release Site Selection for Cetaceans**

Ideally, the rehabilitated cetacean is released into its home range, genetic stock, and social unit. For species such as coastal resident bottlenose dolphins, returning the animal to its exact home range may be extremely important. For widely ranging species such as the pilot whale, specificity of the release site may be less critical as the genetics of these cetaceans may be more *panmictic*. Returning the animal to its home range or species range may increase the likelihood that the animal will have a knowledge of available resources, potential predators, environmental features, and social relationships that would support its successful return to the wild. Also, consideration should be given to time of year since the range of the animal may change based on season and where conspecifics are along their migration route at a given point in time.

In many cases, the precise home range of the individual will not be known. There may not be any information regarding the animal's social unit or its individual ranging patterns prior to its stranding. In some cases, photographic identification records may help identify the home range or social group for some species. When the home range of the cetacean is unknown, the animal should be released at a location near to its stranding site that is occupied regularly by its conspecifics, ideally those of the same genetic stock. Genetic analyses of a tissue sample via a qualified laboratory and appropriate tissue archive may aid with determining the appropriate stock of origin. Pelagic cetaceans are to be released offshore into a habitat occupied by conspecifics at that time of year. For animals that mass strand depending on the life history, social units should be maintained whenever possible thus cetaceans that stranded together should be released together as a group. Because much of cetacean behavior is learned, juveniles should be released with adults or in the presence of conspecifics and mothers with their dependant young.

Other factors to be considered in release site selection are availability of resources and condition of the habitat. NMFS and the Stranding Network Participant are to ensure that severely depleted resources or degraded habitat at the release site do not pose an obvious threat to the released animal. Release plans should include alternative release sites or schedules if there is a substantial decline in resources or habitat quality such as massive fish kills, significant declines in commercial and/or recreational fish landings, harmful algal blooms, or high concentrations of

environmental contaminants. Animals should not be released into areas of dense public use and/or high commercial and recreational fishing activity.

## **H. Marking for Individual Identification of Cetaceans Prior to Release**

NMFS requires all delphinids released in the wild to have a minimum of three forms of identification, including photoidentification (documenting individual identifying physical characteristics such as scars, color pattern, dorsal fin shape, etc.), freeze branding, and dorsal fin tag. For delphinids, photoidentification should include body, face, dorsal fin, flukes, and pectoral flippers. A numerical freeze brand, at least 2" high, is to be placed on both sides of the dorsal fin and on the animal's side just below the dorsal fin, except for species that lack a dorsal fin or have small dorsal fins such as the harbor porpoise. Roto-tags should be attached on the trailing edge of the dorsal fin. Tag application and freeze branding should only be done by experienced personnel as improper tagging may cause excessive tissue damage, infection or premature loss of the tag or mark. Delphinids that fall into the "Releasable Category" will routinely have this triad of identification techniques. Identification of non-delphinid cetaceans is determined in consultation with NMFS. NMFS must receive advance notification of and approve any additional forms of identification that a rehabilitation facility voluntarily wishes to place on a cetacean besides those mentioned above. For instance, NMFS authorization is required prior to placement of VHF radio or satellite-linked radio tag.

The identification system to be used on cetaceans deemed conditionally releasable must be approved by NMFS. As these animals are required to have an advanced post-release monitoring plan, conditionally releasable cetaceans will often be VHF or satellite tagged in addition to photoidentification, freeze-branding, and placement of a visual fin tag.

## **I. Post-Release Monitoring of Cetaceans**

Few data are currently available regarding the fates of released cetaceans. Post-release monitoring provides essential information to develop and refine marine mammal rehabilitation and release practices. "Conditionally Releasable", cetaceans should be monitored daily for at least two months after release. The specific post-release monitoring plan for each cetacean is to be coordinated through NMFS. Post-release monitoring methods may include visual observations from land, sea, or air, and/or radio or satellite-linked monitoring. It is understood that post-release monitoring of cetaceans, particularly pelagic species, is an extensive undertaking for which significant support is required, often from multiple sources. NMFS may be able to provide resources such as financial support, personnel, and equipment for post-release monitoring on a case-by-case basis but is not typical. Therefore, this requirement should be considered at the time of stranding and influence decisions regarding rehabilitation.

The first month after release of the cetacean is a particularly critical period during which it will become evident whether the animal is thriving, including avoiding predators, capturing sufficient prey and being accepted by conspecifics. For coastal species it is recommended that monitoring continue on a regular basis for at least one full year and such funding resources as the Prescott Stranding Grant program can assist with the financial burden of such endeavors. NMFS requires periodic and final reports on released animals. These reports will facilitate future revisions to

the marine mammal rehabilitation and release guidelines. In order to compare individual cases, standardization of data collection protocols for monitoring released cetaceans will be required. NMFS will provide the stranding network with the desired format for receipt of tracking data in reports. Presentation, discussion and formal study of monitoring data and its dissemination to the stranding network will aid in the assessment of cetacean rehabilitation and release programs.

Release plans must include contingencies and resources that are available for recovering the released cetacean should monitoring indicate its failure to thrive. The release plans should also address treatment and euthanasia if the animal is retrieved or restrands. In addition, NMFS may request such contingency plans for “Conditionally Releasable” cetaceans, depending on the circumstances.

## **J. DECISION TREE – CETACEAN RELEASE CATEGORIES**

**RELEASABLE:** The cetacean is cleared for release by the attending veterinarian (including the Assessment Team) and the NMFS Regional Administrator concurs in writing. This means that the requirements for the health and behavior assessment, marking/tagging, and release plan have been met and both veterinary and biological opinions regarding release have been received (See text for details). The following should be true for all assessment points:

History - Cetacean has no historical information requiring consultation with NMFS such as stranding in close temporal or geographic relation to an unusual marine mammal mortality event, stranding associated with an environmental event of concern such as a harmful algal bloom, a hazardous waste spill, an acoustic insult, part of a human interaction or criminal investigation, or involvement in a mass stranding.

### Developmental Stage/Life History

- a) Cetacean has attained sufficient size and age to be nutritionally independent.
- b) Cetacean is not a female with calf.
- c) Cetacean is not deemed to be a geriatric animal and not compromised due to age related conditions.
- d) Cetacean was not exposed to captive or domestic animals during rehabilitation.

### Behavioral Clearance

- a) Cetacean breathes normally, swims and dives effectively.
- b) Cetacean does not exhibit aberrant behavior, auditory, or visual deficits.
- c) Cetacean demonstrates appropriate foraging ability.
- d) Cetacean did not strand as direct result of a failure to avoid predators (an example of possible lack of predator avoidance would be evidence of extensive shark attack wounds in the absence of other primary causes of stranding).
- e) Cetacean did not strand as a result of taking food from humans in the wild.
- f) Cetacean did not strand as a direct result of a demonstrated inability to obtain sufficient food in the wild (e.g., emaciation without a clear medical cause).
- g) Cetacean did not strand as a direct result of conspecific injury.

Medical Clearance

- a) Health status of the cetacean is deemed appropriate for release by the attending veterinarian (animal is likely to survive in the wild and does not pose a threat to wild marine mammal populations).
- b) Hands-on physical exam by the veterinarian at time of admission to rehabilitation and within three days (72 hours) of release.
- c) Laboratory tests performed at time of admission and within seven days of release are complete and submitted for review:
  - CBC;
  - Chemistry Profile to include: Glucose, Sodium, Potassium, Chloride, Calcium, Phosphorus, Iron, Bicarbonate, Alkaline Phosphatase, ALT, AST, GGT, BUN, Creatinine, Uric Acid, CPK;
  - Serum Banking (3 ml upon admission and 3 ml at time of release, more if available; and
  - Aerobic Bacterial Cultures (Blowhole, Rectal, Lesions).
- d) Cetacean is free of drugs (excluding sedatives used for transport) a minimum of 2 weeks prior to release (must document that treatment was effective; clinical values remain normal for at least 2 weeks).

Release Logistics

- a) Tagging/Marking - Delphinids: 3 forms of identification approved by NMFS (dorsal fin tag, freeze brand, photo, other).
- b) Release Site - Return to appropriate stock and geographical site under favorable environmental conditions, and for social species, introduced in areas with conspecifics.
- c) Tracking - minimum of 2 months post-release monitoring coordinated with NMFS (provide NMFS with regular tracking updates).
- d) Provide NMFS a report at the end of the tracking period.

**CONDITIONALLY RELEASABLE:** The cetacean did not meet one or more aspects of the release determination and but may be releasable in the future pending resolution of the problems identified by the attending veterinarian and Assessment Team (See text for details). This may involve discussion with outside experts in consultation with NMFS. Contingency for recapture, treatment, permanent care and euthanasia will be required for failed releases and restranding. The following may be true for one or more assessment points:

History

- a) Cetacean stranded in close temporal or geographic relation to a Marine Mammal Unusual Mortality Event.
- b) Cetacean stranded in association with an environmental event of concern such as a harmful algal bloom, a hazardous waste spill, an anthropogenic acoustic insult.
- c) Cetacean was involved in a mass stranding.
- d) Cetacean stranded previously on one or more occasions.
- e) Single stranding of a social species.

Developmental Stage/Life History

- a) Cetacean is nutritionally dependant based on known life history but older calf with some foraging skills.
- b) Cetacean is recently weaned.
- c) Cetacean is a female with calf.
- d) Cetacean is a geriatric animal and is compromised due to age related conditions.

Behavioral Assessment

- a) Cetacean exhibits aberrant behavior, which may include but is not limited to, abnormal breathing, swimming, and/or diving, auditory or visual dysfunction.
- b) Ability of the cetacean to forage for prey is questionable or logistical circumstances prevent testing of forage or prey capture ability.
- c) Cetacean requires significant conditioning due to developmental stage and/or medical condition.
- d) Predator wounds were likely secondary to another cause of the stranding.
- e) Attraction to humans in the wild has been extinguished.
- f) Cetacean is a social species and has stranded due injury from conspecifics.

Medical Assessment - The attending veterinarian determines that the health status of the cetacean is uncertain regarding suitability for release (concern that the animal has a lower or questionable chance of survival or has a questionable condition or test results indicating that it may pose a health risk to wild marine mammals –reportable disease). The veterinarian arrives at a determination of “Conditionally Releasable” through performance and interpretation of physical examinations and interpretations of tests such as CBC, chemistry profile, cultures and other tests required by NMFS, plus any other diagnostic tests he/she deems necessary to fully evaluate the animal. Response of the cetacean to therapy and the clinical judgment of the veterinarian may also contribute to a determination of “Conditionally Releasable.” Further tests may be required including ultrasound or radiographs to clarify medical issues.

Cetaceans exhibiting any of the following medical or physical conditions are to be discussed with NMFS, with the expectation that without resolution, such conditions will make the animal an unsuitable candidate for release:

- a) Compromised function of sensory systems (auditory, visual).
- b) Decreased range of motion.
- c) Deformed or amputated appendage.
- d) Laboratory tests interpreted as abnormal or suspicious of disease (CBC, chemistry, cultures, or other tests).

Release Logistics

- a) Tagging, marking, post-release monitoring - Extensive post-release monitoring of cetaceans deemed "Conditionally Releasable" is required and is to be approved and coordinated through NMFS. Post-release monitoring of such animals should be at least two months duration, likely longer, and is also likely to include advanced tracking techniques such as satellite tracking via radio-tracking or

photographic identification searches if the animal is likely to move outside of the range of monitoring. The cetacean will continue to be deemed "Conditionally Releasable" until the post-release monitoring plan required by NMFS can be implemented.

- b) Stock of origin is unknown, uncertain, or temporarily unreachable due to environmental (weather conditions) or natural history factors (migration) - When such circumstances exist, the case is to be discussed with NMFS. The cetacean will be deemed "Conditionally Releasable" until specifics of release are approved by NMFS.
- c) Plan for recapture - NMFS may require a recapture plan for a "Conditionally Releasable" cetacean prior to its release as a contingency for the animal should it appear unable to readjust to the wild. The cetacean will continue to be deemed "Conditionally Releasable" until NMFS approves a recapture plan.
- d) Contingency plans if the release is not successful or the animal restrands. This should include plans for follow up treatment, permanent care and euthanasia

**NON-RELEASABLE:** The cetacean is determined to be unsuitable for release by the attending veterinarian and Assessment Team and the NMFS Regional Administrator concurs. The animal did not meet the essential release criteria, and thus does not have a reasonable chance of survival in the wild or poses health risks to wild marine mammals. See section B3 the procedure for placement of nonreleasable animals.

#### History

- a) Cetacean has been in captivity for more than two years or is otherwise too habituated and counter-conditioning techniques have been unsuccessful.
- b) Cetacean stranded previously on one or more occasions.

#### Developmental Stage/Life History

- a) Cetacean is nutritionally and socially dependent, and based on known life history, is not of age to be nutritionally independent (neonate and young nursing calf without foraging skills).
- b) Cetacean is geriatric and exhibiting other medical and/or behavioral abnormalities.

#### Behavioral Clearance

- a) Exhibits abnormal breathing, swimming, diving, or other aberrant behavior that may compromise survival in the wild or may be caused by a disease process of concern to wild marine mammals.
- b) Exhibits auditory or visual dysfunction that would compromise survival in the wild or may be caused by an ongoing disease process of concern to wild marine mammals.
- c) Unable to capture and consume live prey.
- d) Demonstrated inability to avoid predators.

**Medical Clearance** - The attending veterinarian determines that the health of the cetacean precludes release. In such cases, the medical condition of the animal prevents normal function to

a degree that would compromise its survival in the wild or pose a health risk to wild marine mammals. The veterinarian supports the determination of “Non-Releasable” status with required physical examinations and tests such as CBC, chemistry profile, cultures and those required by NMFS plus any other tests he/she deems necessary to fully evaluate the animal. Further tests may be required including ultrasound or radiographs to clarify medical issues. The veterinarian presents his/her findings to the NMFS regional stranding coordinator and recommends that the cetacean be maintained in captivity or be euthanized.

Conditions that warrant consideration that a cetacean be deemed “Non-Releasable” include and are not limited to the following:

- a) Compromised function of sensory systems (auditory, visual).
- b) Decreased range of motion.
- c) Deformed or amputated appendage.
- d) Laboratory tests interpreted as abnormal or suspicious of disease of concern.
- e) Geriatric, believed to have chronic disease, which may compromise survival in the wild.

#### Release Logistics

- a) Tagging/Biomonitoring - the cetacean requires extensive post-release monitoring for which there are insufficient resources.

## V. GUIDELINES FOR RELEASE OF REHABILITATED PINNIPEDS

### A. Introduction

Each year in the United States, several different species of pinnipeds from three taxonomic families, Phocidae (true seals), Otariidae (eared seals), Odobenidae (walrus) are rescued and rehabilitated. As walrus are under the jurisdiction of FWS, these guidelines should be generally applied but there are a few exceptions. Close consultation with FWS is required with each walrus case.

Except as otherwise noted, each pinniped is required to have a complete historical, developmental, behavioral, and medical status assessment by the attending veterinarian and animal care supervisor and be properly marked for identification prior to release. The release determination recommendation must include a signed statement from the attending veterinarian in consultation with his or her Assessment Team that the animal is **medically and behaviorally suitable for release in accordance with the release criteria** and include a written release plan and timeline. NMFS or FWS may require additional testing for reportable diseases in light of new findings regarding various disease and health issues and this information should be included in the release request. A release plan will require a justification statement and detailed description of the logistics for transporting, tagging, location, timing, crowd control, media coordination (if applicable), post release monitoring, and recovery should the animal fail to thrive (e.g., restrands). NMFS or FWS may require recapture if the animal appears to be in distress following a specified time after release. Recapture will require special authorization from NMFS or FWS prior to this activity. NMFS or FWS may consult with individual experts for further guidance. NMFS reserves the right to impose additional requirements in the release plan as stated in 50 CFR 216.27 (a)(3).

The NMFS Regional Administrator may allow for pre-approved waivers for routine pinniped cases as stated in 50 CFR Section 216.27(a)(2)(i)(A). This allows for release of animals without the required 15 day advanced notice or detailed release plan for an individual case. Typically, these waivers apply to cases involving routine diagnosis (i.e., known cause of stranding), treatment, and rehabilitation. Such waivers will require that the Stranding Network Participant submit a treatment and release protocol for approval on a schedule as prescribed in the Stranding Agreement for these types of cases. NMFS may require that a certain percentage of these cases that present with similar clinical signs and diagnosis be thoroughly tested and assessed each year. Similarly, NMFS may give blanket authorization for pre-approved release sites and for post-release monitoring plans.

### B. Overview of RELEASE CATEGORIES for Pinnipeds

Pinnipeds evaluated at rehabilitation facilities can be grouped into one of three “Release Categories” based on historical, developmental, behavioral, ecological, and medical criteria set forth in a **standardized checklist**. It is recommended that the standardized checklist in section V.G. be used to assess and document the release candidacy of rehabilitated pinnipeds. The checklist includes a health statement (i.e., health certificate) to be signed by the attending veterinarian, which verifies that a pinniped meets appropriate standards for release.

The majority of walrus typically strand as calves and are not good release candidates due the extended period of maternal dependency. FWS generally considers walrus calves to be “nonreleasable” and considers all stranded walrus on a case-by-case basis for permanent placement. If the animal is placed in permanent captivity, the receiving facility must hold an Exhibitor’s License from APHIS [7 USC 2131 et seq.] and comply with MMPA (16 USC 1374 Section 104(c)(7)). Questions regarding disposition of stranded walrus should be directed to the FWS contact as identified in Appendix J.

**1. "RELEASABLE":** There are no significant concerns and the animal meets basic historical, developmental, behavioral, ecological, and medical criteria, supporting the likelihood of survival and a lack of risk to the health of wild marine mammals. The release plan (post-release identification, release site, and post-release monitoring) has been approved in writing by NMFS via the letter of concurrence. For the pinniped to be deemed “Releasable,” **all** items on the checklist must be answered as **"Yes."** The attending veterinarian signs the checklist confirming the information and the assessment.

**2. "CONDITIONALLY RELEASABLE":** One or more items on the standardized checklist have been marked **"No"** for pinnipeds in this category. This may pertain to historical, developmental, behavioral, ecological, and/or medical status concerns regarding the animal’s potential to survive in the wild and/or its potential to pose a health risk to other marine mammals. A pinniped may also be deemed conditionally releasable if requirements for release cannot be met at present but may be met in the future and without compromising the health and welfare of the individual animal. In such cases, more time may be needed to determine the feasibility of release (see 50 CFR 216.27(a)(1)(iii)).

All “Conditionally Releasable” pinnipeds must be discussed with NMFS or FWS. NMFS or FWS may consult with individual experts to discuss specific cases. Experts include scientists and veterinarians with expertise in pinniped biology and medicine (particularly experts with species specific knowledge). Such discussions will clarify the most appropriate disposition. For example, additional medical testing, rehabilitative therapy, and additional strategies for post-release monitoring may be required to release a “Conditionally Releasable” pinniped.

**3. "NON-RELEASABLE":** One or more items on the standardized checklist have been marked **"No"** for pinnipeds in this category. This may pertain to historical, developmental, behavioral, ecological, and/or medical status concerns that preclude release to the wild. It has a documented condition demonstrating little chance for survival in the wild and/or a diagnosed health risk to wild marine mammals. This category also includes animals that have been in rehabilitation greater than two years (see 50 CFR 216.27(a)(1)(iii)). Additionally, a pinniped may be deemed “Non - Releasable” if an appropriate release site or post-release monitoring plan cannot be arranged.

If the animal is to be placed in permanent care, the receiving facility must hold an Exhibitors License from APHIS [7 USC 2131 et seq.] and comply with MMPA (16 USC 1374 Section 104(c)(7)). Once the Stranding Network Participant has received written notification from the NMFS Regional Administrator (letter of concurrence), they must contact the Office of Protected

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([http://www.nmfs.noaa.gov/pr/permits/mmpa\\_permits.htm](http://www.nmfs.noaa.gov/pr/permits/mmpa_permits.htm)) within 30 days to request a transfer of custody (to retain or transfer to another authorized facility). This request will require the letter from the NMFS Regional Administrator concurring with the non-release decision (letter of concurrence from the Regional Administrator). As part of the decision making process for permanent placement, NMFS staff may review APHIS compliance records, qualification and experience of staff, transport, and placement plans (i.e., integration based on appropriate composition of species, sex and age and the intended proposed plan for public display or scientific research). Once approved, the Stranding Network Participant and the receiving facility (could be same facility) will receive a letter of authorization for transfer of custody from NMFS OPR and the transfer should occur as soon as possible. Examples of a NMFS letter of concurrence and transfer of custody have been provided in Appendix D.

### C. Historical Assessment of Pinnipeds

Historical stranding information may guide the management of rehabilitation and the plan for post-release monitoring. Important historical information should include:

- 1. A record of previous stranding** - Pinnipeds that have previously stranded and been released, and subsequently strand again, are deemed “Conditionally Releasable” pending consultation with NMFS or FWS. Such animals must be reassessed and as they may have underlying health issues requiring additional evaluation, diagnostic testing and advanced post-release monitoring. Alternatively, such pinnipeds may be assessed as “Non-Releasable” and be transferred to permanent captivity or euthanized.
- 2. An association with an ongoing epidemic among other animals or with a Marine Mammal Unusual Mortality Event** - If the stranding of a pinniped occurs in close temporal or geographic proximity to an Unusual Marine Mammal Mortality Event, fish kill, harmful algal bloom, hazardous waste spill, or other such environmental event, the pinniped is deemed “Conditionally Releasable” and consultation with NMFS or FWS is required. The agencies may request additional testing, documentation, and/or post-release monitoring of such pinnipeds.
- 3. Stranding location and active or home range** - Areas that are worth assessing are increased human activity (e.g. active fishery, increased recreational use, military activity, shipping activity, etc.) or hazardous environmental conditions (e.g., harmful algal bloom or hazardous waste spill, and/or special weather conditions like El Nino, hurricane, extreme cold, extreme heat, etc). During an El Niño event, the rehabilitation center must consult with NMFS regarding management and release of the animal because unfavorable environmental conditions may persist once an animal is ready for release and thus the animal should be deemed “Conditionally Releasable.” Information on areas of human activity and environmental hazards is also vital for determining an appropriate release site.

4. **Exposure to (or injury from) other wild or domestic animals** - Pinnipeds having a history of exposure to terrestrial wild or domestic animals are deemed “Conditionally Releasable” and must be discussed with NMFS or FWS. Pinnipeds may contract disease from terrestrial wild or domestic animals such as foxes or dogs. For instance, canine distemper represents a serious health threat to pinnipeds. Should a rehabilitating pinniped contract such a pathogen, it could transmit the illness to its wild cohorts. Such transmission of pathogens can occur even when a rehabilitated pinniped is not showing clinical signs of disease. Consultation with NMFS or FWS is thus required for pinnipeds that have a history of exposure to terrestrial animals.
5. **A record of attacking or biting a human** - Pinnipeds that have inflicted a bite on a human are deemed “Conditionally Releasable” and must be discussed with NMFS or FWS. A variety of infectious diseases may be transmitted from animals to humans via bite wounds. Although documentation of rabies among pinnipeds is rare, the fatal outcome of this disease in humans warrants careful consideration of factors surrounding pinniped bites to people. NMFS or FWS may require consultation with state public health officials regarding pinnipeds that inflict bites on humans and may request that the facility follow state policies and guidelines for unvaccinated non domestic animal bites. NMFS may also impose quarantine or additional diagnostic testing requirements prior to authorizing release.
6. **Is evidence or part of a human interaction or criminal investigation;**
7. **Was transferred from another holding, triage or rehabilitation facility** – The opportunity for exposure to pathogens can occur at different stages of response and rehabilitation; therefore, it is important to obtain medical records and document the quality of care and treatment at each stage of this process.

#### **D. Developmental Assessment of Pinnipeds**

In order to be deemed "Releasable," a young pinniped must be able to feed itself, and have adequate body condition to survive readjustment to the wild. Generally, pups are to be held in rehabilitation centers for roughly the normal duration of lactation. Because of maternal dependence may vary greatly in some species, it is recommended that the straight length and weight of each pinniped pup be taken at admission and again when evaluating the animal for release to aid in assessment of the animal's body condition. Such measurements may be compared to known weaning lengths and weights of appropriate wild pinniped species or to data from successfully rehabilitated and released stranded pups.

Reproductive status in and of itself does not impact release candidacy of a pinniped unless a female strands with her pup or gives birth during rehabilitation. Such females and their offspring are “Conditionally Releasable” and are to be discussed with NMFS or FWS. The natural history of the pinniped species involved and factors related to maternal relationship may impact the timing and conditions of release for mother or pup. For instance, a pup that has not reached

weaning weight may be releasable with its mother, but not alone. A healthy mother may be kept in rehabilitation to assist its sick or injured pup; however, this should be weighed against the risk of habituation that could minimize the chance of a successful release. Female pinnipeds in estrus or late pregnancy are releasable unless the attending veterinarian believes that the health history of the animal warrants extra precautions to minimize stress during its return to the wild. Such animals are “Conditionally Releasable” due to health concerns and are to be discussed with NMFS or FWS.

Pinnipeds that are in molt are “Conditionally Releasable” and these cases should be discussed with NMFS. Because behavior and physiology change during a molt, factors related to the pinniped’s health history, age, reproductive status, and other relevant parameters must be considered in order to determine if release is preferable to holding the animal until molting is completed.

### **E. Behavioral Assessment of Pinnipeds**

The limitations imposed by the captive environment of rehabilitation may preclude a detailed behavioral assessment where behavior of the captive animal may differ from that displayed in the wild. Also, there lacks a set of behavioral and functional tests that relate to behavior in the wild and there are limitations on the complete knowledge of “normal” behavioral parameters of each species. Behavioral clearance is thus founded on basic criteria necessary for survival of the animal in the wild. The behavioral evaluation often overlaps with the medical evaluation as abnormal behavior may indicate an underlying illness. Biologists and animal care supervisors with expertise in pinniped behavior and the attending veterinarian should jointly assess the behavior of the animal.

To achieve behavioral clearance, a pinniped must breathe normally and demonstrate effective swimming, diving, and locomotion on land (if appropriate for its species). The animal must not display aberrant behavior, auditory or visual dysfunction that may compromise its survival in the wild or suggest underlying disease of concern to wild marine mammals (i.e., reportable disease). Behavioral clearance also includes confirmation that the animal can respond to and able to capture, and consume live prey.

#### **1. Breathing, Swimming, Diving, Locomotion on Land**

Evaluation of respiration is done to determine that the pinniped does not exhibit abnormal breathing patterns or labored breathing during exertion. Evaluation of swimming, diving, and locomotion on land is done to confirm that the pinniped moves effectively and does not exhibit abnormalities such as listing to one side, decreased capacity to submerge, asymmetrical motor patterns, etc. Pinnipeds that display abnormalities of breathing, swimming, diving, or locomotion on land are deemed "Conditionally Releasable" or "Non-Releasable," depending on the nature and degree of their dysfunction.

#### **2. Aberrant Behavior**

Behavioral clearance of the pinniped includes confirmation that the animal does not exhibit aberrant behavior that may compromise survival in the wild or suggest underlying disease of concern to wild marine mammals. Examples of aberrant behavior include but are not limited to regurgitation, head pressing, postural abnormalities such as repetitive arching or tucking, head swaying, stereotypic or idiosyncratic pacing, decreased or unusual range of motion, and abnormalities of breathing, swimming, diving, and locomotion on land as previously discussed. Pinnipeds displaying aberrant behavior are deemed "Conditionally Releasable" or "Non-Releasable" depending on the nature and degree of the behavior.

### **3. Auditory and Visual Function**

Behavioral clearance of the pinniped includes evaluation of auditory and visual function. Auditory dysfunction may be a reflection of active disease, permanent injury, or degenerative changes associated with aging. Evaluators may suspect that a pinniped has compromised auditory function if it responds minimally to loud noises created above or below water. Pinnipeds that have visual dysfunction may show difficulty locating prey items, tendency to collide with boundaries of their enclosure, or difficulty maneuvering about objects placed in their path. Discoloration, swelling, abnormal shape, position, or appearance of the eye or eyelids may suggest visual dysfunction. Pinnipeds with auditory or visual dysfunction should be deemed "Conditionally Releasable" or "Non-Releasable" depending on the degree and nature of their condition.

### **4. Prey Capture**

Rehabilitated pinnipeds should demonstrate the ability to chase, capture, and consume live prey prior to their release. Prey items found in the animal's natural environment should be used whenever possible. If natural prey items are not available, evaluators may utilize other prey species. Evaluation of the pinniped includes assessment of each component of feeding behavior including the ability to chase prey, to actually capture prey, and to consume prey without assistance from humans. Pinnipeds that display ineffective prey capture and consumption are deemed "Conditionally Releasable" or "Nonreleasable." If logistical issues preclude evaluation of prey capture and consumption or there is a question about the quality of live prey, NMFS or FWS should be consulted.

Rehabilitated pinnipeds that have been in captivity longer than one year and young pinnipeds having little or no previous foraging experience in the wild require particularly careful assessment of feeding behavior. Repeated feeding trials using live prey with concurrent assessment of the animal's ability to maintain good body condition are helpful in thoroughly evaluating such animals.

## **F. Medical Assessment of Pinnipeds**

The medical assessment includes information related to any diagnostic testing, treatment, and response to treatment. The attending veterinarian should perform a hands-on-physical examination upon admission and prior to the release determination. The attending veterinarian should review the animal's complete history including all stranding information and diagnostic testing (i.e., required by NMFS and any additional data), and medical and husbandry records (including food consumption and weight and length progression). The primary goal of testing required by NMFS or FWS is to safeguard the health of wild marine mammal populations. This is achieved by testing for diseases that pose a significant morbidity or mortality risk to wild populations (i.e., reportable diseases). Those that are zoonotic or public health and safety concern require immediate NMFS notification to assure proper protocols are put into place. Additional testing will be required if the animal was part of an official Marine Mammal Unusual Mortality Event. NMFS may request testing for other emerging diseases as part of a surveillance program to identify potential epidemics of concern and to monitor changes in disease status that may have occurred due to rehabilitation practices. The directive for the pre-release health screen will come from the NMFS Regional Stranding Coordinator through the Marine Mammal Health and Stranding Response Program. Appendix -F lists diseases of concern for pinnipeds and provides brief descriptions of some basic and advance diagnostic techniques.

A complete health screen must be completed upon admission and just prior to release including basic blood collection for a CBC, chemistry profile (Chem-12 including BUN and creatinine, enzymes and electrolytes), serology, microbial and fungal culture (i.e., blow hole, rectal, and lesions), cytology, urinalysis, and fecal exam. If the animal is female and at reproductive age, it is advisable that pregnancy be ruled out prior to prescribing potentially fetal toxic medication. Serum (3ml) should be banked at the time of admission and just prior to release for retrospective studies. Cessation of antibiotics should occur two weeks prior to release examination to assure that the animals is no longer dependant on the medication and that the drug has cleared based on the pharmacokinetics and requirements made by the veterinary community and the Food and Drug Administration. Some antibiotics clear the body quickly and require shorter withdrawal time; therefore, when this recommendation cannot be met seek advice from NMFS. The veterinarian must provide written notification to the NMFS Regional Stranding Coordinator that a health screen and assessment of the pinniped scheduled to be released has been performed. The notification must also include the final release plan and a plan for hands-on physical examination by the attending veterinarian within 72 hours of its release. The required documentation and signed release determination recommendation will be part of the administrative record along with the signed (by the NMFS Regional Administrator) letter of concurrence approval for release.

It is of extreme importance that the pinniped be monitored closely for disease throughout its rehabilitation. Regardless of the stranding etiology, handling and care can cause significant stress increasing susceptibility to disease. If not properly managed, rehabilitation facilities provide an environment where genetically altered or novel pathogens not typically encountered in the wild can easily be transmitted from animal to animal. This scenario can be problematic when an animal is exposed and becomes a carrier of that pathogen to a naïve wild population if released. Introduction of pathogens from rehabilitation centers to the wild is a significant concern as diseases with serious epizootic potential have been detected (Stoddard et. al., 2005).

Infectious agents may become more pathogenic as they pass through new individuals and naïve species or genetically altered from indiscriminant use of antibiotics.

The attending veterinarian is urged to utilize the full spectrum of diagnostic modalities available for health assessment of the pinniped. In addition to basic blood work, serology, microbial culture, cytology, urinalysis, and fecal exam, advanced techniques for pathogen detection such as PCR and toxicology analyses are available. A number of diagnostic imaging techniques including radiology, CAT scans and MRI may be used as well as bronchoscopy and laparoscopy. The pinniped literature has expanded to include numerous references on the performance and interpretation of diagnostic tests.

Both agencies may request testing for other emerging diseases as part of a surveillance program to identify potential epidemics of concern and identify health trends. Additional testing will be required if the animal was part of an official Marine Mammal Unusual Mortality Event. Specific testing requirements (i.e., pre-release health screen) will come from the NMFS Regional stranding coordinator through the Marine Mammal Health and Stranding Response Program and follows the term and responsibilities stated in the NMFS Stranding Agreement.

**G. “Recommended” Standard Checklist to Determine Release Category of all Rehabilitated Pinnipeds (except walrus)**

Completion of the recommended checklist below including a signature from the attending veterinarian documents fulfillment of NMFS requirements for assessment of the pinniped prior to release. **By checking “Yes” to all statements asserts that the pinniped is suitable for release. By checking “No” to any of the statements means that a condition has been identified that requires consultation with NMFS in order to determine the release candidacy of the pinniped.**

**Recommended CHECKLIST TO DETERMINE RELEASE CATEGORY**

**Yes = true statement**

**No= untrue statement**

| <b>History</b>  | Yes | No | Page<br>Reference |
|---|-----|----|-------------------|
| 1. Stranding was NOT associated with an El Niño event   |     |    |                   |
| 2. Stranding was NOT associated with a Marine Mammal Unusual Mortality Event  |     |    |                   |
| 3. Stranding was NOT associated with anthropogenic environmental accident (e.g., hazardous waste spill, acoustic insult)                  |     |    |                   |
| 4. Stranding was NOT associated with an environmental event of NMFS concern (e.g., harmful algal bloom, fish kill, etc.)                  |     |    |                   |
| 5. The animal is NOT evidence or part of a human interaction or criminal case   |     |    |                   |
| 6. There is NO evidence that the release candidate was exposed to terrestrial wild or domestic animals prior to and during rehabilitation |     |    |                   |
| 7. The release candidate is NOT known to have inflicted a bite on human(s)  |     |    |                   |
| 8. The release candidate has NOT previously stranded  |     |    |                   |
| <b>Developmental Stage</b>  |     |    |                   |
| 9. The release candidate is weaned, and has a proven ability to feed itself   |     |    |                   |
| 10. The release candidate is sufficiently robust, having adequate reserves to survive readjustment in the wild                            |     |    |                   |
| 11. The release candidate shows no sign of molt   |     |    |                   |
| <b>Behavioral Clearance</b>   |     |    |                   |
| 12. The release candidate demonstrates appropriate breathing, swimming, diving, and locomotion on land                                    |     |    |                   |
| 13. The release candidate does not exhibit auditory or visual dysfunction   |     |    |                   |
| 14. The release candidate demonstrates a capacity to chase and capture live prey  |     |    |                   |
| 15. The release candidate demonstrates an absence of aberrant behavior  |     |    |                   |



## **H. Release Site Selection for Pinnipeds**

The release of a rehabilitated pinniped must be planned to maximize its chances for survival. The release must be timed and staged to increase its likelihood of foraging success and acceptance by conspecifics. Factors including its species, age, reproductive status, previous home range, social unit, and migratory patterns must be considered. Weather conditions at the release site, other environmental factors impacting the habitat and food availability must also be evaluated.

The rehabilitated pinniped is to be released into its home range, genetic stock, and social unit whenever possible. Return of the animal to its home range is preferable as the reacclimating pinniped would presumably have familiarity with available resources, potential predators, environmental features, and social relationships. In many cases, this can be accomplished by releasing the pinniped at its stranding site through a simple hard-release process (i.e., the animal is released directly after transport to the release site without acclimation through holding in a temporary enclosure at the site).

For migratory species such as hooded and ringed seals, the release site selection, is considered on a case-by-case basis. Consultation with NMFS is required for these cases. If conspecifics migrate to a site distant from the original stranding site, rehabilitators may consider various options depending on the natural history of the species and the temporal relationship of release to seasonal distribution. The pinniped may be released to migrate on its own or with conspecifics still in the vicinity. Alternatively, the pinniped may be held in captivity until conspecifics return or it may be transported to the location of its migrated cohorts. The risks of extended time for the pinniped in captivity, logistics of transport to a migration site, and costs associated with the extended stay are examples of factors to be considered. As explained later in this section, movement of pinnipeds recovering from infectious disease to other sites must be carefully considered regarding disease risk to wild pinnipeds.

When information on the animal's ranging patterns or social unit prior to stranding is not known, or when a pinniped strands outside of the previously known range of its species, NMFS is to be consulted regarding an appropriate release strategy. For pinniped species that have vast territorial ranges such as those that naturally traverse the length of the North American continent, knowledge of the animal's specific ranging patterns previous to stranding may not be necessary. Such pinnipeds may be released in the general vicinity of their stranding site or anywhere within the vast range inhabited by that species with the following important exception (see below).

When a pinniped has recovered from an infectious disease, it may be preferable to release the animal near its original stranding site in order to minimize disease risks to wild pinnipeds. For example, even if the entire population of a far-ranging pinniped species has been exposed to a particular infectious agent, changes in the virulence of the pathogen may initially occur at distinct geographical sites. A seal exposed to a particularly virulent strain of pathogen in the far Northeast may pose a health risk to pinnipeds in the Mid-Atlantic that have not yet encountered that particular strain of virus. Additionally, the clinical signs of many infectious diseases mimic each other. As rehabilitation centers cannot always perform definitive diagnostic tests for all viral agents, moving rehabilitated pinnipeds from the general region of their stranding to distant

locations for release may pose some risk to wild marine mammals. NMFS is to be consulted regarding the preferred release site when pinnipeds recovering from infectious illness cannot be released near their original stranding site.

It is important to ensure that conditions at the release site do not pose any obvious immediate threat to the released animal such as areas where resources and habitat is severely depleted or degraded. If evidence exists of a substantial decline in resources or habitat quality such as massive fish kills, significant declines in commercial and/or recreational fish landings, red tides, etc., it may not be appropriate to release the pinniped until conditions at the release site improve or a different release site is found. Also, release in areas of dense public use and/or high commercial and recreational fishing activity should be avoided.

### **I. Identification of Rehabilitated Pinnipeds Prior to Release**

NMFS and FWS have determined that all pinnipeds must be flipper tagged for identification prior to release to the wild. Tags and placement instructions are to be obtained from NMFS or FWS/USGS (for walrus) as appropriate for the pinniped species (see Appendix J for contact information. Although resightings of flipper-tagged individuals may provide some information regarding the relative success of a rehabilitation effort, flipper tags are not reliable for long-term monitoring. They may be difficult to read from a distance and may become damaged or lost. Other methods for identification such as freeze-branding, glue tags, etc. may be used in addition to flipper tags.

### **J. Post-Release Monitoring of Pinnipeds**

Post-release monitoring of pinnipeds provides essential information for the development and refinement of marine mammal rehabilitation and release practices. Post-release monitoring methods may include visual observations of tagged or freeze-branded pinnipeds from land, sea or air, as well as radio or satellite-linked monitoring. Radio and satellite-linked monitoring programs are highly desirable as they provide a wealth of information regarding the activities and fates of released animals. NMFS or FWS may require and coordinate post-release monitoring plans for “Conditionally Releasable” pinnipeds. Additionally, rehabilitation centers may voluntarily provide post-release monitoring plans for routinely released pinnipeds. When such monitoring will be performed voluntarily, the rehabilitation center is required to inform NMFS or FWS of the intent to implement post-release monitoring when seeking authorization for release of the pinniped.

The first month after release of the pinniped is a particularly critical period during which it will become evident whether the animal is thriving, including capturing sufficient prey and being accepted by conspecifics. It is recommended that monitoring continue on a regular basis via field observations, radio, or satellite-linked monitoring for up to one full year and such funding resources as the Prescott Stranding Grant program can assist with the financial burden of such endeavors. NMFS may request these data in order to make future revisions to pinniped rehabilitation and release guidelines. In order to compare individual cases, standardization of data collection protocols for monitoring released pinnipeds may be helpful and this should include the length of the tracking time, the type of tracking equipment, and assessment of

outcome. Formal study of monitoring data and its dissemination to the stranding network can aid in the assessment of pinniped rehabilitation and release programs.

Release plans should include contingencies for recovering the released pinniped should monitoring indicate its failure to thrive including options for treatment, permanent care, or euthanasia. In addition, NMFS will request such contingency plans for “Conditionally Releasable” pinnipeds, depending on the circumstances.

## VI. GUIDELINES FOR RELEASE OF REHABILITATED MANATEES

### A. Introduction

West Indian manatees (*Trichechus manatus*) are found throughout the Caribbean basin. In the United States, the Florida subspecies (*Trichechus manatus latirostris*) is commonly found in southeastern coastal waters, with Florida at the core of its range. The Antillean subspecies (*Trichechus manatus manatus*) is found outside of Florida throughout the Caribbean basin (including Puerto Rico and possibly Texas). While most reports of distressed manatees occur in Florida, manatees have been rescued throughout the region. The focus of manatee rescue and release activities is to promote the conservation of wild manatee populations.

Reports of distressed manatees include animals compromised by human activities and natural causes. Human causes of distress include collisions with watercraft, entrapment in structures, entanglement in and ingestion of fishing gear and debris, and other sources. Natural causes of distress include exposure to cold and brevetoxins, mother/calf separation, seasonal disorientation, etc. The FWS Jacksonville Field Office coordinates the manatee rescue, rehabilitation, and release program to assist these animals. The FWS Jacksonville Field Office conducts this program according to the provisions of an Endangered Species Act/Marine Mammal Protection Act (ESA/MMPA) marine mammal enhancement permit issued by the FWS Division of Management Authority (DMA). The permit authorizes “take” activities for an unspecified number of manatees for the purpose of enhancing its survival and recovery, consistent with the FWS manatee recovery plan developed pursuant to the ESA. The FWS Jacksonville Field Office coordinates a network of individuals, facilities, and agencies (including the Florida Fish and Wildlife Conservation Commission) through Letters of Authorization (LOA) to rescue, rehabilitate, and release manatees in need of assistance.

The following guidelines were first developed by program participants in 1991 and subsequently revised in 2001. They are based on more than twenty years of program history and include the experiences, advice, and expertise of resource managers, field biologists, veterinarians, behavioral experts, animal keepers, and other dedicated individuals. The guidelines are to be used by authorized participants to guide the return of rehabilitated manatees to the wild.

### B. Overview of Release Categories for Manatees

Manatees undergoing rehabilitation are evaluated by program participants and placed into one of four Release Categories:

1. **“RELEASABLE”**: Manatees that have been successfully treated, are of an appropriate size, demonstrate appropriate behaviors, have the skills necessary to thrive in the wild, and do not pose a threat to wild populations will be considered releasable. Additionally, distressed manatees that are assisted in the wild and then released on-site are characterized as “Releasable”. These include fit (healthy, non-injured) manatees superficially entangled in fishing gear, animals isolated by high water or detained by structures such as water control structures, sheet pile walls, booms, and other barriers, seasonally disoriented animals, and others. (“Seasonally disoriented” manatees include otherwise fit animals that fail to migrate to

appropriate winter habitats during the periods of cold weather. These animals are typically relocated to warm water sites within their region of origin.)

2. **“CONDITIONALLY RELEASABLE”**: Manatees with a condition and/or circumstances that present a question regarding the success of release or ability to thrive in the wild but likely not pose a threat to wild populations will be considered conditionally releasable. Animals described as “Conditionally Releasable” typically include medically-cleared, captive-reared animals and older, long term-captives. The status of animals considered to be “Conditionally Releasable” may change to “Releasable” if their condition or circumstances improve or to “Conditionally Non-releasable” if their condition or circumstances deteriorate.

3. **“CONDITIONALLY NON-RELEASABLE”**: Manatees that cannot be released because their condition and/or circumstances threaten the well-being of the animal and/or may pose a threat to the wild population will be considered conditionally non-releasable. The status of animals considered to be non-releasable may change to “Releasable” or “Conditionally Releasable” if their condition or circumstances improve over time. This category may include individuals with permanently debilitating medical conditions.

4. **“NON-RELEASABLE”**: The FWS will review, on a case-by-case basis, requests to establish the non-releasability of certain captive-held manatees. Manatees deemed non-releasable will be medically characterized by a disease process, that proves to be a significant risk to the wild population or by significant physical injuries (such as loss of paddle or significant spinal trauma) that would preclude the ability of an animal to thrive in the wild. Petitions to establish non-releasability of individual manatees will be reviewed by an independent panel which will make their recommendations to the FWS. The FWS will consider the request and recommendation and will then determine the status of the animal. Should an animal be deemed non-releasable by the FWS, the receiving facility will need to meet the requirements to receive an enhancement permit in accordance with Section 104 (c)(4) of the MMPA (16 U.S.C. 1374(c)(4)), Section 10(a) of the ESA (16 U.S.C. 153(a) and the FWS issuance criteria at 50 CFR 17.22.

### **C. Historical Assessment of Manatees**

Efforts are made to maintain complete, detailed records that document rescued manatees from the time of rescue to their eventual disposition. These records generally include information describing the rescue, circumstances surrounding the stranding (*e.g.*, red tide, cold weather, etc.), treatment(s), captive care, and resolution of the case (*i.e.*, death, euthanasia, or release). In the case of previously known wild individuals, these records can include documentation of behavioral and reproductive patterns, migratory habits, and site fidelity. For all released animals, these records should also include all post-release monitoring information.

These records guide the treatment of individual stranded manatees and provide an evaluative tool that allows program managers and participants to assess and improve methods and procedures to better ensure success. As an example, in the case of red tide-related strandings, records detail the rescue of a manatee(s), noting the stranding site in the context of a red tide event, the presentation of the animal (beached, convulsing, etc.), any behaviors noted during transport,

appropriate neurologic treatment, post treatment observations, and eventual release. (Release plans for the animal should require information characterizing the status of red tide within the planned release area.) Such detailed documentation has helped with efforts to develop effective rescue, rehabilitation, and release methods for red tide stranded animals.

#### **D. Developmental Assessment of Manatees**

“Releasable” animals must be nutritionally independent (weaned and off of supplemental nutritional support), greater than 200 cm in total length and more than 600 pounds in weight, and there should be no concerns regarding the animal’s length of time in captivity, relative to its age. On occasion, smaller suckling calves are released with their dam to ensure that the dam’s wild experience is passed on to her calf. Based on observations of cow/calf bonding behavior, this will help to improve the calf’s wild skills and ability to survive in the wild.

“Conditionally Releasable” manatees should demonstrate nutritional independence, especially in the case of older calves planned for release. Recently weaned juveniles are also considered as release candidates. In both instances, animals should meet “Releasable” criteria for length and weight. Manatees that have spent lengthy periods of time in captivity (relative to their age) also fall into this category. Concern has been expressed that older, long-term captives may have a diminished ability to thrive in the wild (at the extreme are animals that have been in captivity for more than 50 years). While concern for these older animals may be well-placed, it is difficult to know at what age (if any) these animals’ condition and lack of wild skills will compromise the success of their release. As such, older animals are considered on a case-by-case basis for release. The release of older manatees is being conducted in the context of a research program that will yield data to help ensure success for subsequently released individuals meeting similar criteria.

“Conditionally Non-releasable” manatees include animals that are not nutritionally independent, do not meet the length and weight criteria for “Releasable” animals, and/or lack the wild skills that are essential for a successful release.

“Non-releasable” manatee will be reviewed by the FWS on a case-by-case basis.

#### **E. Behavioral Assessment of Manatees**

“Releasable” manatees must exhibit normal behaviors while in captivity and are, therefore, expected to be able to meet behavioral challenges when in the wild. Normal behaviors include typical breathing, swimming, diving, and foraging/drinking patterns. Foraging behaviors include the ability to feed in salt, brackish, and fresh water environments without becoming dehydrated. Manatees must also demonstrate an ability to feed on natural vegetation located at various levels in the water column. Historically, captive manatees have been fed at the water surface. Naive animals fed in this fashion have had difficulties finding food on the bottom after release. Current feeding practices include feeding at the bottom and top of the water column.

While abnormal behaviors in manatees have not been defined, animals that exhibit atypical behaviors (as determined by FWS and its advisors) while in captivity will be considered for

release on a case-by-case basis. Behaviors that elicit concerns include stereotypic behavioral displays, adaptability or sensitivity to change (including going off feed, shutting down, etc.), and perceived affinities for humans and human activities while in captivity. These affinities should not be confused with the manatee's innate ability to explore their captive environment, including humans, especially in the absence of other engaging stimuli. Efforts should be made to de-condition or extinguish these behaviors before release.

#### **F. Medical Assessment of Manatees**

Prior to release, release candidates must be examined by a veterinarian experienced in manatee medicine. Examinations should include a review of the animal's complete history, a hands-on physical examination, and diagnostic testing. The exam should include bloodwork, including CBC and serum chemistries. Serological and bacteriological assessments should be conducted when deemed necessary by the attending veterinarian. Results of analyses should be consistent with known values for animals of similar age, size, and sex and consistent with historical values for that specific animal. A "medically cleared" manatee will be free of medical problems, not limited in its ability to thrive in the wild, and will not pose a threat to wild populations.

Manatees that have unresolved injuries, compromising physical conditions (malnutrition, dehydration, etc.), active/infectious disease processes, injuries that significantly affect mobility and range of motion (e.g., the loss of a paddle, failure to adapt appropriate buoyancy control, etc.) and other debilitating conditions are considered to be "Conditionally Non-releasable". In the event that these concerns are resolved, these animals may be categorized as "Releasable" or "Conditionally Releasable".

#### **G. Decision Tree for Release Categories - Manatees**

The following is a list of criteria used to help determine the release status of captive manatees. Please note that an animal's status may change as various criteria are met. (These criteria generally apply to all species/subspecies of manatees unless otherwise indicated.)

#### **RELEASABLE:**

##### Developmental Stage/Life History

- a. Nutritionally independent.
- b. For Florida manatees, length must be >200 cm. and weight >600 lbs. (unless released with dam).
- c. No concerns about length of time in captivity relative to age.

##### Behavioral Assessment

- a. Must exhibit normal behaviors, including typical breathing, swimming, and diving patterns, while in captivity.
- b. Must be able to eat natural vegetation and adapt to salt, brackish, and fresh water regimes.

- c. Must demonstrate ability to feed on natural vegetation at various levels in water column.

### Medical Assessment

- a. No active, demonstrable medical problems.
- b. Medically cleared based on examination by a veterinarian experienced in manatee medicine.
- c. Poses no threat to wild populations.

### Pre-release Requirements

- a. The animal must be individually recognizable.
  - i. All identifiable markings should be completely documented with sketches and photographs.
  - ii. In the absence of individually identifiable markings, the animal should be freeze branded. The brands should be sketched and photographed.
  - iii. All released manatees should be PIT tagged and information recorded and logged.
- b. Blood and/or tissue samples must be taken for serum banking and genetics.
- c. Ultrasound measurements of blubber layers must be taken as an initial indicator of health status.

### Release Logistics (a release plan should be prepared for each released animal)

- a. Telemetry should be considered when appropriate, subject to approval by FWS.
- b. Animals should be released in close proximity to their point of origin, when appropriate (in the case of previously known animals, suitable sites may be selected within the animal's home range).
- c. Release sites should be free of harmful algal blooms and other compromising factors.
- d. For captive-reared, naive animals in Florida, release sites should include natural warm water sites within the animal's home range or that of the parent. Such releases should occur during the winter, thereby improving possibilities for bonding to the site and building associations with cohorts.

### **CONDITIONALLY RELEASABLE:**

Developmental Stage/Life History - Developmental considerations include animals that may be characterized by one or more of the following conditions:

- a. Partial nutritional independence.
- b. For Florida manatees, less than 200 cm in length and/or 600 lbs in weight.
- c. Social dependence.
- d. Recent weaning (stranded as a neonate, captive weaned, etc.).

- e. Extended period of time (relative to age) in captivity.

#### Behavioral Assessment

- a. Exhibits abnormal behavior(s) in captivity.
- b. Unable to eat natural vegetation and adapt to salt, brackish, and fresh water regimes.
- c. Unable to feed on natural vegetation at various levels in water column.

#### Medical Assessment: Animals with the following conditions may be considered for release:

- a. Physical impairment (may include animals with damage to or loss of appendages, animals with impaired range of motion, etc.)
- b. Reproductive condition (may include pregnant females, lactating females with calves, etc.)

#### Pre-release Requirements

- a. The animal must be individually recognizable.
  - i. All identifiable markings should be completely documented with sketches and photographs .
  - ii. In the absence of individually identifiable markings, the animal should be freeze branded. The brands should be sketched and photographed.
  - iii. All released manatees should be PIT tagged and information recorded and logged.
- b. Blood and/or tissue samples must be taken for serum banking and genetics.
- c. Ultrasound measurements of blubber layers must be taken as an initial indicator of health status.

#### Release Logistics

- a. Requires radio-tagging and intensive monitoring efforts following guidelines developed by FWS and its advisors (including veterinarians, animal behavior specialists, and researchers).

#### **CONDITIONALLY NON-RELEASABLE:**

Developmental Stage/Life History - Developmental considerations include animals that may be characterized by one or more of the following conditions:

- a. Nutritionally dependent
- b. For Florida manatees, less than 200 cm in length and/or 600 lbs in weight.
- c. Extreme concerns about length of time in captivity relative to age.

#### Behavioral Assessment

- a. Exhibits abnormal behavior(s).
- b. Unable to eat natural vegetation and adapt to salt, brackish, and fresh water regimes.
- c. Unable to feed on natural vegetation at various levels in water column.

#### Medical Assessment

- a. Not medically cleared (animals with active/infectious diseases, permanent, demonstrable physically debilitating injuries, and/or other concerns).
- b. Poses a threat to wild populations.

#### NON-RELEASEABLE:

- a. Animals deemed permanently non-releasable will be:
  - i. Permanent captive
  - ii. Euthanized, as deemed necessary to prevent pain and suffering or in cases with an inevitable outcome.

If FWS has determined that a manatee is permanently non-releasable, the holding facility may request a permit for permanent placement of the animal as long as the facility meets the requirements under Section 104(c)(7) of the MMPA and Section 10 of the ESA.

b. Inbred animals: There are currently two inbred manatees in the U.S. captive manatee population. At the present time, these animals are considered to be conditionally non-releasable due to concerns regarding immunological compromise. Other concerns include observed problems with inbreeding, as seen in the European captive manatee population, which includes high infant mortality and breeding suppression. Given these concerns and questions about the effects of the release of inbred animals into the wild population, these two animals can not be released at this time are presently considered conditionally non-releasable.

c. Pre-Act animals: The U.S. captive manatee population currently includes four Florida manatees brought into captivity prior to the adoption of Federal prohibitions preventing the display of endangered marine mammals. The care and disposition of these "Pre-Act" animals are the responsibility of their respective owners.

#### **H. Pre-release Requirements for Manatees**

Prior to release, all animals must be individually recognizable. While many animals are either naturally marked or have scars from encounters with boat propellers, other animals have no markings and should be freeze branded with a unique number/letter combination (the selection of the sequential number/letter combination must be made beforehand in consultation with FWS). All markings (including freeze brands) should be done well in advance of release if possible and all markings should be sketched and photographed. PIT tags (one on either side of the shoulders, cranial to each scapula) should also be implanted. Ultrasound measurements of blubber layers

must be taken prior to release as a baseline indicator of the animal's body condition. Blood and/or tissue samples should also be taken prior to release for serum banking and genetics.

### **I. Release and Post-release Logistics for Manatees**

If at all possible, animals should be released in close proximity to the site where originally rescued. For captive-reared, Florida manatees with no wild experience, these animals should generally be released within their region of genetic origin and into natural warm-water areas during the winter to encourage winter site fidelity and familiarity with local conditions and association with wild manatees. When appropriate, telemetry may occur, pursuant to approval from FWS. (Current tagging methodologies make it difficult to radio tag and belt manatees less than 220 cm in total length.) In the case of rehabilitated, wild born adults, many of these animals can be released back into areas where researchers actively track wild manatees and can be monitored as part of these projects.

Post-release monitoring is required for all conditionally releasable animals. Such monitoring includes equipping animals with transmitters (satellite, VHF, and/or sonic, as appropriate) for both remote and on-site monitoring. On-site monitoring should include visual observations of the animal once or twice a week; protocols vary between higher and lower risk candidates. At a minimum, biomedical assessments should be conducted within the first three months after release, six months after release, and twelve months after release. (If there is any question about the animal's health based on field or remote observations, assessments should occur more frequently. If the animal's well-being has been compromised as determined by these assessments, the animal should be returned to captivity.) Biomedical monitoring includes an examination of overall body condition, length and other morphometrics that include girths, weight, blubber thickness, collection of blood, fecal, urine, milk, semen, and tissues samples when possible. Results of analyses should be consistent with known values for animals of similar age, size, and sex and consistent with historical values for that specific animal. While there is no agreed upon definition of success, program participants generally agree that if an animal has thrived in the wild (and met foraging and fresh water needs) for at least a year, if it has demonstrated an ability to successfully winter at a warm water site (Florida manatees), and if it has contributed to the production of offspring, then it is considered a successful release.

Pre-release conditioning may be required for conditionally releasable animals. Such conditioning may include exposing manatees to natural forage positioned at the surface and on the bottom of their tank. Natural forage includes a variety of vegetative types found within the animal's range and may also include palatable exotics such as *Hydrilla*. If an animal is to be released into water that differs from the type of water in their tank of origin, the animal should be acclimated to the type of water best suited to the release environment to minimize post-release stress, especially in the case of naive animals. Conditioning may also include minimizing exposure to humans to reduce or eliminate any affinity the animal may have or may potentially develop toward humans and human activity. Trained/learned behaviors must be extinguished to the greatest extent possible prior to release.

In special cases, "soft release" methodologies should be considered as a means to enhance survivorship in the wild. "Soft releases" typically rely upon temporary holding facilities

established within the release area. Manatee(s) are kept in these facilities where they are maintained and observed for a period of at least several weeks. This temporary adaptation period allows for acclimation to waters at the release site, introduction to in situ forage, close observation of behaviors, and ease in capture/handling for biomedical assessments prior to release. Supplemented forage can be reduced during the containment period. At release, the “soft release” concept initially encourages brief forays away from the enclosure and allows for the individual to return to the now familiar holding facility. Further reduction in supplemental feeding will promote greater use and exploration of surrounding habitats. Use of this methodology is to be considered where individual cases warrant additional release scrutiny and release locations allow for its implementation.

#### **J. Manatee Rescue, Rehabilitation, and Rescue Program Reporting/Requesting Requirements**

The FWS uses an electronic database that requires program participants to report events within 24 hours of occurrence. Release requests should be received and requested electronically 30 days prior to the release. The Reporting Requirements are listed in Appendix C.

## **VII. GUIDELINES FOR RELEASE OF REHABILITATED SEA OTTERS**

### **A. Introduction**

Sea otters (*Enhydra lutris*) are found in near shore waters of the North Pacific. Several subspecies and stocks have been identified in California, Washington, Canada, Alaska, and Russia. Sea otters may strand for a variety of reasons including trauma, disease, inability to forage, etc. Guidelines for release of rehabilitated sea otters are intended to address the welfare of these animals and any impacts the rehabilitated animals may have on wild otter populations.

Like many other marine mammals, stranded sea otters are often reported on beaches frequented by humans. In some cases, humans intercede and otherwise healthy pups are removed from the wild. The sea otter's small size makes it relatively easy to transport; however, there are currently few facilities capable of meeting the requirements for successful rehabilitation. These guidelines are intended to be used by facilities authorized to rehabilitate marine mammals under the MMPA and ESA, if applicable, and that are actively involved in the rehabilitation of sea otters for subsequent return to the wild. Questions regarding disposition and release approval of stranded sea otters must be directed to the appropriate FWS specialist as identified in Appendix J.

### **B. Developmental Assessment of Sea Otter Pups**

Sea otter pups are generally dependent on their mothers for the first 6 to 12 months of life. Newborn pups are readily distinguished by their natal pelage, small size (generally less than 6 pounds), and inability to care for themselves. Pups prematurely separated from their mothers or found stranded on a beach shortly after weaning are generally less than 20 pounds in weight and typically lack foraging skills necessary for survival.

Successful rehabilitation of stranded sea otter pups for release to the wild requires a significant commitment of time and resources. Facilities that receive a stranded pup and are unable to rear the pup for possible release to the wild must immediately contact the FWS (as identified in Appendix J) to determine the disposition of the animal.

Rehabilitated sea otter pups that are at least 6 months of age, weigh at least 20 pounds, demonstrate adequate foraging, grooming, and social skills may be released to the wild. Rehabilitated sea otter pups must be monitored closely post-release to determine if their transition to the wild is successful (see post-release monitoring below).

### **C. Behavioral Assessment of Sea Otters**

Certain behaviors are necessary for survival of rehabilitated sea otters. In addition, aberrant behaviors may preclude release to the wild. Rehabilitated sea otters may be released to the wild if the following behavioral criteria are met in the opinion of rehabilitation personnel familiar with normal sea otter behavior:

1. The rehabilitated sea otter must demonstrate the ability and willingness to forage and capture live prey. This includes the use of tools such as rocks used to pound shelled prey;
2. The rehabilitated sea otter must demonstrate basic survival skills and activities including active foraging, pelage management, diving, and resting;
3. The rehabilitated sea otter must demonstrate “normal” social skills including interest in other sea otters and should exhibit a wariness of humans and anthropogenic activities; and
4. The rehabilitated sea otter must not exhibit any aberrant behavior including behavior that may pose an unusual threat to human health and safety, wild sea otter populations, or other marine mammal populations.

#### **D. Medical Assessment of Sea Otters**

All rehabilitated sea otters must have a comprehensive, hands-on physical examination by a veterinarian experienced in sea otter medicine prior to release. The attending veterinarian must determine that the sea otter is likely to survive in the wild and must certify that:

1. Blood sampling performed within two weeks of the proposed release date, including a CBC and serum chemistry profile, falls within normal ranges for the species;
2. Medical diagnostic tests performed within two weeks of the proposed release date (e.g., cultures, biopsies, urinalysis, serology, virology, parasitology, immunology, etc) fall within normal parameters for the species or indicate a satisfactory state of health (reference CRC Handbook of Marine Mammal Medicine, 2<sup>nd</sup> Edition, Eds. Lesley A. Dierauf and Frances M.D. Gulland, CRC Press, 2001);
3. The rehabilitated sea otter should be free of drug residues (excluding sedatives used for transport or to facilitate physical examinations) and maintain good clinical health for two weeks prior to release or for a period that satisfies the attending veterinarian that the animal is healthy;
4. The rehabilitated sea otter must have functional vision and hearing, reasonable dental health, and good control and function of all appendages, at least to the degree that its survival in the wild is not compromised; and
5. The rehabilitated sea otter does not pose a known threat (e.g., transmission of pathogens, congenital defects) to the wild sea otter populations or human health and safety.

#### **E. Release Categories for Sea Otters**

Despite our best efforts to rehabilitate stranded sea otters, many animals die or can never be released to the wild. The following categories have been identified to help determine the status of sea otters being held for rehabilitation:

**RELEASABLE:** All rehabilitated sea otters meeting the medical and behavioral criteria listed above shall be considered releasable. Every effort should be made to release these animals to the wild as soon as they are deemed fit for release.

**CONDITIONALLY RELEASABLE:** All live-stranded sea otters admitted to a rehabilitation program shall be considered conditionally releasable pending the outcome of rehabilitative treatments and a full medical examination and behavioral evaluation.

**NON-RELEASABLE:** Sea otters that fail to meet one or more of the required criteria for release may be considered non-releasable. Rehabilitation facilities that believe that they may have an animal that is non-releasable must contact FWS (as identified in Appendix J) for concurrence on this finding and eventual disposition of the animal. Once FWS has determined that a sea otter is non-releasable, the holding facility may request a permit for permanent placement of the animal as long as the facility meets the requirements under Section 104(c)(7) of the MMPA and Section 10 of the ESA (if applicable).

#### **F. Identification of Sea Otters Prior to Release**

Rehabilitation facilities must affix colored and numbered “Temple” tags to the rear flippers of each sea otter prior to release. In addition, a PIT tag must be implanted in the right inguinal area of each otter. With an appropriate scientific research permit issued by FWS, the rehabilitation facility may implant an abdominal VHF transmitter to facilitate post-release tracking and monitoring of the animals. In all cases, the selection of identification numbers, tag colors/positions, and VHF frequencies must be coordinated with other facilities and researchers in the area that sea otters are released.

#### **G. Release Site Selection for Sea Otters**

All rehabilitated sea otters should be released at or near the site where they originally stranded. In cases where this is not feasible, other release sites may be considered under existing Federal permits, letters of authorization, or through consultation with personnel from the FWS (as identified in Appendix J). In all cases, rehabilitated sea otters must be released into the same stock or population from which they originated.

#### **H. Post-Release Monitoring of Sea Otters**

All facilities releasing rehabilitated sea otters must establish a post-release monitoring program appropriate for each sea otter. The purpose of post-release monitoring is to determine the success of rehabilitation efforts and provide an opportunity for rescue of animals not able to make the transition back to the wild. Sea otters brought into rehabilitation as young pups must be tracked intensively immediately after release. Juveniles or sub-adults may require a focused effort while adult animals may be tracked opportunistically. Sea otters implanted with VHF

transmitters should be tracked and monitored periodically for the duration of the battery life of the transmitters (i.e., 1-3 years).

### **VIII. POLICIES REGARDING RELEASE OF REHABILITATED POLAR BEARS**

Polar bears (*Ursus maritimus*) occur in most ice-covered seas of the Northern Hemisphere and are circumpolar in distribution, although not continuously. Off the Alaskan coast, they normally occur as far south as the Bering Strait. In the Beaufort and Chukchi seas, polar bears make extensive migrations between the United States and Canada or Russian territories, respectively. These movements are thought to be related to seasonal and annual changes in ice position and condition.

Polar bears normally found stranded in Alaska and subsequently recovered are generally orphaned cubs-of-the-year that are either incapable of fending for themselves or have not yet developed the skills to adequately survive in the wild. While these animals are temporarily placed in facilities for the purposes of rehabilitation and release, in the long term, it is highly unlikely that such cubs would be suitable for release back into the wild. Hunting and survival skills are learned during the 2 ½ year dependence on the mother, are not innate to polar bear cubs, and will not be developed in captivity.

For the reasons noted above, the FWS considers polar bear cubs to be poor candidates for release into the wild. If releases were to occur the predicted likely outcomes would be death by starvation or death caused by a predacious attack of another polar bear. Further, adoption by another family group is unlikely or impractical due to the low probability of encountering a receptive family group. Adoption of cubs into family groups has been attempted in Canada with very poor success and Canada is re-evaluating the feasibility of adoption as a management technique. The process of adoption requires substantial investment in searching out a family group in the wild, capture of the group (assisted by helicopter), and placement and follow-up on the fate of the adoptee. In Alaska, holding facilities co-located near release sites are not available. Therefore, we do not consider adoption to be a viable alternative and generally consider polar bear cubs to be non-releasable and more suitable for permanent placement in public display facilities. In these cases, the holding facility may request a permit for permanent placement of the animal as long as the facility meets the requirements under Section 104(c)(7) of the MMPA. However, we will continue to evaluate potential release into the wild or permanent placement in public display facilities on a case-by-case basis. Questions regarding disposition of stranded polar bears must be directed to the FWS as identified in Appendix J.

**IX REFERENCES****(incomplete)**

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**Su, C., D. Evans. R.H. Cole, J.C. Kissinger, J.W Ajioka, and L.D. Sibley.** 2003. Recent expansion of *toxoplasma* through enhanced oral transmission. *Science* vol. 229: 414-416.

## **X. GLOSSARY** **(incomplete)**

**Animal Care Supervisor**

**Attending Veterinarian**

**Authorized Representative**

**Cohorts**

**Conspecifics**

**Diseases of Public Health and Safety Concern**

**Diseases of Zoonotic Concern**

**Emerging Diseases**

**Epidemic** (adjective) – affecting or tending to affect an atypically large number of individuals within a population, community, or region at the same time

**Epizootic** (noun) – an outbreak of disease affecting many animals of one kind at the same time (Merriam-Webster Dictionary)

**Ethogram**

**FWS**

**FWS Division of Management Authority**

**FWS Field Offices**

**FWS Letter of Authorization**

**Humane Care** – Treatment of an animal in such a way to both minimize pain and suffering and (by providing for proper care and use of the animal) to maximize well being of the individual and the population into which it is to be released.

**Human Interaction**

**Letter of Concurrence from the NMFS RA**

**Letter of Request for Transfer of Custody**

**NMFS**

**NMFS Disposition Regulation and Policy**

**NMFS National Stranding Coordinator**

**NMFS Office Director**

**NMFS Regional Director**

**NMFS Regional Stranding Coordinator**

**Official Marine Mammal Unusual Mortality Event**

**Panmictic**

**Pre-Release Health Screen**

**Release Determination Recommendation**

**Release Plan**

**Reasonable Social Groups**

**Reportable Diseases**

**Signatory**

**Stranding Agreement**

**Stranding Network Participant**

**Sub Designee**

**Surveillance Program  
Working Group on Marine Mammal Unusual Mortality Events  
109(h) Stranding Participant**

## **XI APPENDICES**

### **APPENDIX A**

#### **Chronology of Development of the Release Criteria**

**1977 1<sup>st</sup> Workshop on Marine Mammal Strandings;** sponsored by Marine Mammal Commission - Geraci, J.R. and D. J. St Aubin (eds.) 1979. *Biology of marine mammals: Insights through strandings*. Marine Mammal Comm. Rep. No. MMC-77/13. U.S. Dep. Commer., NTIS Doc. PB 293 890, 343 p. (August 1977 Athens, GA). One of the workshop objectives was to (4) provide recommendations regarding the handling, care, and disposition of live-stranded animals. A relevant finding that came from this workshop and was published in the proceedings included that if live-stranded animals are rescued and rehabilitated, decisions whether these animals should be released or maintained in captivity must take into account the possibility that the animals may have lost their natural capacity to locate and capture appropriate prey species, avoid predators, and interact normally with other members of the species.

**1987 2<sup>nd</sup> Workshop on Marine Mammal Strandings;** sponsored by the Marine Mammal Commission and the National Marine Fisheries Service - Reynolds, J.E. and D.K. Odell (eds.) 1991. *Marine mammal strandings in the United States: proceedings of the second marine mammal stranding workshop*; 3-5 December 1987, Miami, FL. Dep. Commer., NOAA Tech. Rep. NMFS 98. A recommendation that came from this workshop and was published in the proceedings was a call to establish guidelines and procedures for determining whether and how live-stranded animals should be marked and returned to the sea, transported to a holding facility, rehabilitated, and subsequently released or maintained in captivity, or euthanized to avoid further pain and suffering.

**1991 Workshop on rescue, rehabilitation, and release of marine mammals;** sponsored by the Marine Mammal Commission and the National Marine Fisheries Service - St. Aubin, D.J., J.R. Geraci, and V.J. Lounsbury (eds.) 1996. *Rescue, rehabilitation, and release of marine mammals: an analysis of current views and practices*. Proceedings of a workshop December 3-5, 1991, Des Plaines, IL. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-OPR-8, 65 p. The participants were charged to address five critical questions as well as discuss other outstanding and relative issues. They made several recommendations to include the assembly a panel of medical and behavioral specialists to recommend criteria for assuring that released animals will prosper humanely and pose no undesirable risk to the wild population. The guidelines should include a recommended set of medical determinations by species, with appropriate reference ranges for blood constituents and other clinical measures, morphometric limits (weight at length and age), a checklist for physical examination, and a means of scoring behavioral attributes that would influence survival in the wild. Minimum values should be set for each of these criteria, such that no animal failing any measure would be released. The panel would incorporate the recommendations of the group considering the risks associated with specific pathogens, particularly for “carriers” that are otherwise normal and healthy. The participants also made recommendations on disease transmission and monitoring.

**1992 Amendment of MMPA Title IV** - 16 U.S.C. 1421a, Sec. 402. (a) DETERMINATION FOR RELEASE. The Secretary shall, in consultation with the Secretary of the Interior, the Marine Mammal Commission, and individuals with knowledge and experience in marine science, marine mammal science, marine mammal veterinary and husbandry practices, and marine conservation, including stranding network participants, develop objective criteria, after an opportunity for public review and comment, to provide guidance for determining at what point a rehabilitated marine mammal is releasable to the wild. Sec 402 (b) COLLECTION - The Secretary shall, in consultation with the Secretary of the Interior, collect and update, periodically, existing information on – (1) procedures and practices for – (A) rescuing and rehabilitating stranded marine mammals, including criteria used by stranding network participants, on a species-by-species basis, for determining at what point a marine mammal undergoing rescue and rehabilitation is returnable to the wild.

#### **1994 Expert Panel on Behavior, Life History, and Natural History Criteria for Release of Rehabilitated Marine Mammals**

Acting on the findings of the 1991 workshop entitled “Workshop on rescue, rehabilitation, and release of marine mammal,” NMFS consulted with the Working Group on Unusual Marine Mammal Mortality Events to develop draft criteria. An expert panel of 12 biologists, veterinarians, and animal care professionals was queried by Dr. Randall Wells of the Chicago Zoological Society in August 1994 to address 12 specific questions on marine mammal behavior, life history, and natural history relative to release. Dr. Wells submitted a report summarizing the panel’s responses to NMFS in November 1994, and reported the findings at the annual meeting of the Marine Mammal Commission in November 1994. This report included recommendations for release criteria, preparations for release, release, follow-up monitoring, and dissemination of findings. These recommendations were included in the draft document.

#### **1994 Model for Marine Mammal Medical Criteria for Introduction to the Wild**

In 1994, Dr. Gregory Bossart of the University of Miami School of Medicine established a committee of 7 nationally-recognized marine mammal veterinarians to formulate a draft of medical criteria that would act as guidelines for the re-introduction of wild marine mammal species. Marine mammal species included in this draft were cetaceans, pinnipeds, sea otters and manatees. This draft was submitted to NMFS and became the working template for the present NMFS draft release medical guidelines.

**1996 Final Rule NMFS 50 CFR Sec. 216.27(a)** require release of a marine mammal held for rehabilitation within six months of capture unless “...the attending veterinarian determines that: (i) The marine mammal might adversely affect marine mammals in the wild (ii) Release of the marine mammal to the wild will not likely be successful given the physical condition and behavior of the marine mammal; or (iii) More time is needed to determine whether the release of the marine mammal in the wild will likely be successful...”

**1998 FR Notice Draft NOAA Tech Memo - NMFS and FWS Release for Stranded Marine Mammals to the Wild: Background, Preparation, and Release Criteria Vol.63, No. 67/ Wed, April 8, 1998** - A notice of availability and request for comments was published in the Federal Register.

**2001 April 24, 2001 Summary of Public Comments Draft NOAA Tech Memo - NMFS and FWS Release for Stranded Marine Mammals to the Wild: Background, Preparation, and Release Criteria** - contractor Dr. Rose Borkowski assimilates public comments. NMFS received official responses from 20 individuals or organizations. There were several outstanding issues that required more development and clarification. NMFS decided to convene special working groups to address the comments.

**2001 Working groups on pinnipeds and cetaceans** – three working groups were assembled by NMFS and FWS to address outstanding issues noted during the public comments period. Their recommendations have been incorporated in the current document.

**APPENDIX B****Key Legislation: Marine Mammal Rescue, Rehabilitation, and Release to the  
the Wild  
(insert copy)**

- **Marine Mammal Protection Act (MMPA) of 1972**
  - Title I. - Conservation and Protection of Marine Mammals
    - Section 109 (h) - Taking of Marine Mammals as Part of Official Duties
    - Section 112 (c) - Contracts, Leases, and Cooperative Agreements
  - Title IV. - Marine Mammal Health and Stranding Response
    - Sec. 402 (a) - Determination for Release
    - (b) (1) – Procedures and Practices
  
- **Endangered Species Act of 1973, as amended**
  
- **Code of Federal Regulations, Title 50, part 216 – Regulations governing the taking and importing of marine mammals**
  - Section 22 – Taking by the State or Local Government Officials
  - Section 27 - Release, Non- Releasability, and Disposition Under Special Exception Permits for Rehabilitated Marine Mammals
    - (a) Release Requirements, (b) Non-releasability and postponed determinations, (c) Disposition for special exceptions purposes, (d) Reporting
  - Subpart D – Special Exceptions for Threatened and Endangered Marine Mammals
    - Marine Mammal Health and Stranding Response Program Enhancement Permit
  
- **Code of Federal Regulations, Title 50, part 18 – Marine Mammals**
  - Section 22 – Taking by Federal, State, and Local Government Officials
  - Section 31 – Scientific Research Permits and Public Display Permits
  
- **Code of Federal Regulations, Title 50, part 17 – Endangered and Threatened Wildlife and Plants**
  - Section 21 (c)(3) – Endangered Wildlife Prohibitions – Take
  - Section 31 (b) – Threatened Wildlife Prohibitions
  - Section 22 – Endangered Wildlife Permits for Scientific Purposes, Enhancement of Propagation of Survival, or for Incidental Taking
  - Section 32 – Threatened Wildlife Permits - General

**APPENDIX C**

**REQUIRED REPORTING AND DOCUMENTATION**

**Marine Mammal Stranding Report - Level A Data (NOAA 89-864, OMB #0648-0178)**

**(insert copy)**

**Marine Mammal Rehabilitation Disposition Report (NOAA 89-878, OMB #0648-0178)**

**(insert copy)**

**Manatee Rescue, Rehabilitation and Release Report**

**(see below)**

**Rescue: Reporting Requirements**

Name of Reporting Organization

Date Report Filed

Date Event Occurred

Type of Rescue

Identification

    Name (if any)

    Studbook Number

    Identification Numbers (in the case of multiple numbers, all numbers should be entered)

PIT Tag

    Right (identifying number)

    Left (identifying number)

Freeze Brand (yes/no)

    Number

Sex

Weight (lbs/kg)

    Actual/estimated

Length (cm/inches)

    Actual/estimated

Ultrasound (yes/no)

County

Nearest Town/Community

Waterbody

Latitude/Longitude

Probable Cause for Rescue

    (Drop down list includes various common causes; additional information is required for entangled animals.)

Health Status at Time of Report

Rehabilitation Facility (if any)

Veterinarian

Facility Supervisor

Rescue Participants

Name of Reporter  
Telephone Number

**Release: Request Information**

Name of Requesting Organization

Date Request Filed

Date Event Proposed

Identification

    Name (if any)

    Studbook Number

    Identification Numbers (in the case of multiple numbers, all numbers should be entered)

PIT Tag

    Right (identifying number)

    Left (identifying number)

Freeze Brand (yes/no)

    Number

Other Tags

Name of Tracker/Affiliation

Tracker Telephone Number

Sex

Weight (lbs/kg)

    Actual

    Date Taken

Length (cm/inches)

    Actual

    Date Taken

Peduncle Girth (cm)

    Date Taken

Ultrasound (yes/no)

County Where Rescued

Nearest Town/Community

Waterbody

Latitude/Longitude

Date of Rescue

Weight at Time of Rescue

Length at Time of Rescue

Proposed Date of Release

Actual Date of Release

County Where Released

Nearest Town/Community Where Released

Waterbody Where Released

Veterinarian

Facility Supervisor

Release Participants

Name of Reporter

Telephone Number

**Transfer: Request Information**

Name of Requesting Organization

Date Request Filed

Date Event Proposed

Identification

    Name (if any)

    Studbook Number

    Identification Numbers (in the case of multiple numbers, all numbers should be entered)

Sex

Weight (lbs/kg)

    Actual

    Date Taken

Length (cm/inches)

    Actual

    Date Taken

Date Brought Into Captivity

Date of Proposed Transfer

Actual Date of Transfer

Veterinarian

Facility Supervisor

Release Participants

Name of Reporter

Telephone Number

**Death: Reporting Requirements**

Name of Reporting Organization

Date Report Filed

Date Died

Identification

    Name (if any)

    Studbook Number

    Identification Numbers (in the case of multiple numbers, all numbers should be entered)

Sex

Date Rescued

Probable Cause of Death (or Euthanised)

Disposition of Carcass

Veterinarian

Facility Supervisor

Name of Reporter

Telephone Number

**Captive Birth: Reporting Requirements**

Name of Reporting Organization

Date Report Filed

Date Born

Identification

Name (if any)

Studbook Number

Identification Numbers (in the case of multiple numbers, all numbers should be entered)

Sex

Weight (lbs/kg)

Actual

Date Taken

Length (cm/inches)

Actual

Date Taken

Present Health Status

Origin of Dam

Circumstances of Birth

Dam Identification

Name (if any)

Studbook Number (if any)

Identification Numbers (in the case of multiple numbers, all numbers should be entered)

Sire Identification

Name (if any)

Studbook Number (if any)

Identification Numbers (in the case of multiple numbers, all numbers should be entered)

**APPENDIX D**  
**(insert)**

- **Example Stranding Participant - NMFS Correspondence  
(Request for Release Determination)**
- **Release Plan**
- **NMFS Letter of Concurrence**
- **Request for Letter for Transfer of Custody**
- **NMFS Authorization of Transfer of Custody**

**APPENDIX E****DISEASES OF CURRENT CONCERN FOR CETACEANS  
(current up to 2001)**

The diseases listed below are of current concern for cetaceans. Numerous additional diseases exist among cetaceans and should also be considered during diagnostic work-ups. Testing for specific diseases of cetaceans is not required at this time. However, thorough diagnostic testing of rehabilitated cetaceans is strongly recommended as warranted by their history and clinical signs of illness. Clinicians are particularly encouraged to test cetaceans for brucellosis and morbillivirus. NMFS may require disease testing for specific individuals prior to release if concern for the health of wild marine mammals exists or concern exists regarding the animal's likelihood of survival in the wild. Contact the NMFS coordinator for information regarding the appropriate diagnostic laboratories.

**BACTERIAL DISEASES    COMMENTS****Brucellosis**

Serologic evidence or isolation of this bacterium has been made several species of cetaceans as well as those in captivity. Different serovar than terrestrial species. Current limited understanding of pathophysiology and significance. May cause reproductive illness, isolated from an aborted captive bottlenose dolphin fetus. Zoonotic. Human case followed handling of marine mammal tissues. (Dunn et.al., 2001; Brew et al., 1999; Clavareau, 1998; Miller, et.al., 1999).

**Erysipelothrix**

Has caused acute septicemia or generalized dermatitis in several cetacean species including wild orca. Believed to be acquired from ingestion of fish contaminated with the organism. Zoonotic, causes dermatitis, arthritis, pneumonia, or septicemia in man. (Dunn et.al., 2001; Young et.al., 1997; Cowan et.al., 2001.)

**Respiratory Illness**

Respiratory illness is common among both captive and wild cetaceans. Such disease often involves bacterial pathogens and is frequently fatal. *Staphylococcus aureus* and *Pseudomonas aeruginosa* as well as Gram negative bacterial organisms are often involved. Pulmonary parasitism may contribute to development of bacterial respiratory disease. (Dunn et.al., 2001; Howard et.al.1983; Kinoshita et al. 1994).

**VIRAL DISEASES**

- Morbillivirus** Has caused major epizootics with high mortalities in bottlenose dolphins, common dolphins, and striped dolphins. Has also infected other cetacean species. Testing for cetacean morbillivirus is strongly recommended for all cetaceans in rehabilitation centers. (Kennedy-Stoskopf, 2001; Kennedy, 1998; Duigan, 1999).
- Poxvirus** Common infection of captive and wild cetaceans characterized by skin lesions. Not known to cause systemic infection. Appearance of lesions may correlate with weaning, poor general health, and/or compromised environmental conditions. (Kennedy-Stoskopf, 2001; Van Bressem and Van Waerebeek, 1996; Geraci et al. 1979).
- Papillomavirus** Has caused lesions of the skin, genital area, stomach, and tongue of several cetacean species. Sometimes referred to as benign tumors. Genital lesions may be transmitted venereally and may interfere with copulation. (Kennedy-Stoskopf, 2001; Deguise et al., 1994; Van Bressem et al., 1996).

## PARASITIC DISEASES

- Toxoplasmosis gondii*** Protozoan parasite which has caused serious disease and death in cetacean species. Source of infection not clearly defined. (Dailey, 2001; Migaki, 1990.)
- Anasakid nematodes** Family of nematodes which parasitize the cetacean gastrointestinal tract. Infections may cause gastritis and ulceration. (Dailey, 2001; Smith, 1989).
- Hepatic trematodes** Heavy infection may cause serious liver disease associated with weight loss, increased susceptibility to bacterial infection. May result in death. (Dailey, 2001; Zam et al., 1971.)
- Nasitrema sp.*** Nematode parasite which infects nervous systems of cetaceans. May be a significant cause of stranding in odontocetes. Causes eighth cranial neuropathy, encephalitis, and cerebral necrosis. (Dailey, 2001).
- Lungworms** Includes nematode genera such as *Halocercus* which may cause severe respiratory disease and may cause death, depending on severity of infection. (Dailey, 2001; Measures, 2001; Moser and Rhinehart, 1993).

**NONINFECTIOUS DISEASES**

- Anthropogenic trauma** Entanglement in debris such as fishing nets and lines, collisions with boats, and underwater detonation of explosives may injure or kill cetaceans. The number of animals affected relative to total population may cause particular concern for some species (i.e. right whales and boat collisions, small odontocetes and fisheries by-catch). (Gulland et al. 2001, Kraus, 1990, Perrin et.al., 1994).
- Biotoxins** Toxins naturally produced from dinoflagellates and diatoms have been associated with illness and death in cetaceans. Brevetoxin was a possible cause of bottlenose dolphin mortality in 1946-47 and 1987-1988. Humpback whale mortality was associated with consumption of mackerel containing saxitoxin. (Gunter et.al., 1948; Geraci, et.al., 1989).
- Neoplasia** Belugas of the St. Lawrence River have had a concerning rate of neoplasia. Other cases of neoplasia have been reported in several species. Etiology of cetacean tumors is not known. Interplay of physical, chemical, and/or infectious agents with host factors such as age, sex, and genetic make-up likely involved with tumorigenesis. (Gulland et.al., 2001; De Guise et.al., 1994).

**APPENDIX F****DISEASES OF CURRENT CONCERN FOR PINNIPEDS**

(current up to 2001)

The diseases listed below are of current concern for pinnipeds. Numerous additional diseases exist among pinnipeds and should also be considered during diagnostic work-ups. Testing for specific diseases of pinnipeds is not required at this time. However, thorough diagnostic testing is strongly recommended for pinnipeds as warranted by their history and clinical signs of illness. NMFS, or in the case of walrus the FWS, may require disease testing for specific individuals prior to release if concern for the health of wild marine mammals exists or if there is significant concern regarding the animal's likelihood of survival in the wild. Contact the NMFS coordinator, or the FWS in the case of walrus, for information regarding appropriate diagnostic laboratories.

**BACTERIAL DISEASES****COMMENTS**

**Brucellosis** Serologic evidence or isolation of this organism has been obtained for phocids and walrus. Different serovar than terrestrial species. Current limited understanding of pathophysiology and significance. May cause reproductive illness. Zoonotic. Human case followed handling of marine mammal tissues. (Dunn et.al., 2001; Garner et. al., 1997).

**Leptospirosis**

Severe systemic illness that frequently affects California sea lions and northern fur seals. Infection may be obtained at sea, in rookeries, or via contact with fresh water sources contaminated by infected terrestrial mammals via contamination of water sources. May be treated with antibiotics. Zoonotic. (Dunn et.al., 2001; Schoenwald et. al., 1971; Gulland et.al., 1996, Stamper et al., 1998).

**Mycobacterial Disease**

Illness characterized primarily by skin or pulmonary lesions diagnosed in several pinniped species. Caused by organisms which include those responsible for tuberculosis. Recently diagnosed in wild subantarctic fur seals. Zoonotic. (Dunn et. al., 2001, Cousins et.al., 1993, Bastida et.al., 1999).

**VIRAL DISEASES****Adenovirus**

Caused fatal hepatitis in California sea lions. Source of virus unknown, but may be related to canine adenovirus. (Kennedy-Stoskopf, 2001; Dierauf et.al., 1981).

- Calicivirus** Several pinniped species susceptible. Causes skin lesions in California sea lions. Numerous animal species may be infected by calicivirus including fish, reptiles, mammals. Transmission from marine mammals to terrestrial animals and vice versa possible. Unconfirmed as zoonotic but possibility exists. (Kennedy-Stoskopf, 2001; Smith and Boyt, 1990; Gage, et.al., 1990; Barlough et.al., 1998).
- Herpes Virus** May infect several pinniped species including walrus. Causes fatal disease in neonatal Pacific harbor seals characterized by severe adrenal gland and liver pathology. (Kennedy-Stoskopf, 2001; Gulland et.al., 1997).
- Influenza** Caused high mortality among Atlantic harbor seals. Endemic among this population. Changes in virulence may cause disease outbreaks. Related to avian influenza. Zoonotic. Has caused severe conjunctivitis among humans. (Kennedy-Stoskopf, 2001; Webster et.al., 1981).
- Morbillivirus** Endemic in several phocid species. May cause high morbidity and mortality. Seals have been infected by the canine morbillivirus as well as a morbillivirus specific for phocids. (Kennedy-Stoskopf, 2001; Kennedy, 1998; Duignan, 1999).
- Pox** Causes skin lesions in several pinniped species. Outbreaks may be associated with stress as with postweanling animals recently introduced to captivity. Zoonotic. May cause skin lesions on humans. (Kennedy-Stoskopf, 2001; Hicks and Worthy, 1987).

## PARASITIC DISEASES

- Helminths** A variety of nematode, trematode, and cestode parasites infect pinnipeds, causing varying degrees of clinical disease. For instance, the nematode *Contracaecum corderoi* has caused gastrointestinal perforations and fatal peritonitis in California sea lions. (Dailey, 2001; Fletcher, 1998.)
- Cryptosporidiosis** Protozoan gastrointestinal parasite recently isolated from several pinniped species. Limited current knowledge of pathophysiology in pinnipeds. Zoonotic. (Miller, et.al., 2001; Deng, et.al., 2000).
- Giardia** Protozoan gastrointestinal parasite identified in phocids and the California sea lion. Incidence and severity of clinical illness not

fully understood. Zoonotic. (Miller, et.al., 2001; Measures and Olson, 1999.)

**Sarcocystis**

Protozoan parasite that may cause severe neurologic disease and death. Important cause of mortality among Pacific harbor seals. Organism may be found in waste from humans or their activities (Miller, et. al., 2001; LaPointe, et.al., 1998).

**NONINFECTIOUS DISEASES****Anthropogenic trauma**

Gunshot, underwater detonation of explosives, and entanglement in debris such as fishing nets and lines cause morbidity and mortality among pinnipeds. (Gulland, et.al., 2001).

**Biotoxins**

Harmful algal blooms producing domoic acid have caused significant sea lion mortality. (Gulland, 2000; Schoelin, et.al. 2000).

**Neoplasia**

Carcinoma, an aggressive tumor often associated with the urogenital system is common in California sea lions. May be linked to viral infections and/or exposure to environmental contaminants. (Buckles, et.al., 1996, Gulland, et.al., 1996, Lipscomb, et.al., 2000).



**Meningoencephalitis**      *Toxoplasma gondii* has caused the death(s) of Florida manatees (Buerguelt and Bonde, 1983).

**Other**      Endoparasites are commonly found in manatees; however, pathological signs or clinical disease are rare (Bossart 2001).

## **NONINFECTIOUS DISEASES**

**Anthropogenic trauma**      Collisions with boats, entanglement in fishing gear (monofilament fishing line, crab float lines, etc.), crushing in water control structures, etc., are sources of injury and mortality

**Biotoxins**      Brevetoxins associated with *Kerania brevi* and possibly other dinoflagellates have killed dozens of Florida manatees. Suspected vectors include ingestion of toxin-containing ascidians and sea grasses and inhalation of aerosolized toxicants (Bossart 2001).

**Cold stress syndrome**      Exposure to cold for extended periods of time initiates clinical signs and disease processes that characterize manatee cold stress syndrome. Effects include lethargy, anorexia, and terminal hypothermia. Numerous significant cold fronts extending the length of the Florida peninsula have caused deaths and cold stress in dozens of manatees over the past few decades (Bossart 2001).

## APPENDIX H

### DISEASES OF CURRENT CONCERN FOR SEA OTTERS (DRAFT - STILL IN REVIEW)

The diseases listed below are of current concern for sea otters. Numerous additional diseases exist among sea otters and should also be considered during diagnostic work-ups. Testing for specific diseases of sea otters is not required at this time. However, thorough diagnostic testing is strongly recommended for sea otters as warranted by their history and clinical signs of illness. FWS may require disease testing for specific individuals prior to release if concern for the health of wild marine mammals exists or if there is significant concern regarding the animal's likelihood of survival in the wild. Contact the FWS coordinator for information regarding appropriate diagnostic laboratories.

#### BACTERIAL DISEASES    COMMENTS

|                       |  |
|-----------------------|--|
| <b>Septicemias</b>    | Overwhelming bacterial infections, sometimes from infected wounds, sometimes from intestinal infections, are an occasional cause of mortality. Connections with sewage or animal wastes are suspected in some infections (refs). |
| <b>Dental disease</b> | Dental disease is common, particularly in older animals and can lead to systemic bacterial infections.   |
| <b>Leptospirosis</b>  | Problem common in sea lions (see above pinniped section). Positive serologic titlers in southern sea otters (Hanni <i>et al.</i> 2003). Cases reported in Washington sea otters.   |

#### VIRAL DISEASES

|                              |   |
|------------------------------|---|
| <b>Morbillivirus</b>         | Conflicting evidence on whether exposure is relatively common or not is southern sea otters. Canine distemper has been diagnosed in a river otter in coastal British Columbia (Mos <i>et al.</i> 2003) and positive serologic titers have been noted in Washington sea otters. Care must be taken in moving otters if this virus is present in some populations and not others. |
| <b>Papillomavirus</b>        | Some evidence this type of viral infection occurs, significance probably not great. (refs.).  |
| <b>Valvular endocarditis</b> | This a sporadic disease secondary to chronic bacterial seeding from a primary source of infection such as a bite wound or tooth abscess. However, northern sea otters in Alaska have been   |

diagnosed with VE without primary source (FWS unpublished data). These animals have tested positive for the *Streptococcus bovis/equis* complex. In human cases, there is an association between *S.bovis* endocarditis cases and a malignancy of the GI tract.

## PARASITIC DISEASES

### *Toxoplasma gondii*

Protozoan parasite which can cause serious disease and death in southern sea otters and Washington sea otters. High prevalence of exposure in California with moderate mortality rate. There is evidence of wide exposure in Washington sea otters (Lindsay *et al.* 2001, Dubey *et al.* 2003). Currently there is no evidence of infection in northern sea otters in Alaska. Source of infection not clearly defined but associated with freshwater inputs to ocean. (Miller, *et al.*, 2001; Dailey, 2001; Migaki, 1990.)

### *Sarcocystis neurona*

Protozoan parasite that may cause severe neurologic disease and death. Important cause of mortality among southern and Washington sea otters. Infections appear to progress more quickly than *T. gondii*. (Miller, *et al.*, 2001).

### Helminths

A variety of nematode, trematode, and cestode parasites infect sea otters, causing varying degrees of clinical disease. Acanthocephalan thorny headed worms, particularly the *Proflicollis* spp may be pathogenic when overwhelming infestations occur, particularly in young animals. (Mayer *et al.*, 2003)

### Mites

Nasal mite infestations are fairly common but their distribution may not be uniform. Rarely infections can result in aspiration of mites and pneumonia.

### *Giardia*

Some northern sea otters in Alaska have tested positive (FWS unpublished data).

## NONINFECTIOUS DISEASES

### Anthropogenic trauma

Gunshot, boatstrike, oil spills, and entanglement in debris such as fishing nets and lines cause morbidity and mortality among sea otters. Alaskan otters have died from impactions with fish bones when feeding at cannery outfalls. (FWS unpublished data).

- Biotoxins** Harmful algal blooms particularly those producing domoic acid have caused some morbidity and mortality in sea otters. (Gulland, 2000; Schoelin, *et al.*, 2000).
- Predation** White shark predation on southern sea otters is well documented. Some cases may be secondary to brain infections or intoxications that render otters helpless. Killer whale predation is hypothesized to be very significant in the decline of certain northern sea otter populations in Alaska.
- Neoplasia** A number of types of neoplasia have been documented in northern sea otters (FWS unpublished data).
- Intestinal Disease** Sea otters have been know to suffer from intestinal intussusceptions, torsions, and impactions not caused by human related causes.
- Conspecific Trauma** Territorial males will often attack other male or pups. Males may also injure females during mating.

**References:**

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- Lindsay, S.D., N.J. Thomas, A.C. Rosypal, and J.P. Dubey. 2001. Dual *Sarcocystis neurona* and *Toxoplasma gondii* infection in a Northern sea otter from Washington state, U.S.A. *Veterinary Parasitology* 97:319-327.
- Mos, L., P.S. Ross, D. McIntosh, and S. Raverty. 2003. Canine distemper virus in rivers otters in British Columbia as an emergent risk for coastal pinnipeds. *Veterinary Record* 152:237-239.

## APPENDIX J

## Cetacean – Species Specific Developmental Stages (Age-Length) and Social Dynamics

| <u>Scientific Name</u>            | <u>Common Name</u>             | <u>Approx Length at Birth (cm)</u> | <u>Approx "NEONATE" length (cm)</u> | <u>Approx Length at 1 Year of Age (cm)</u> | <u>Approx Length at 2 Years of Age (cm)</u> | <u>Approx. Age at Weaning (yrs)</u> | <u>Approx Length at Weaning (cm)</u> | <u>Aprox. Adult Length (cm)</u> | <u>Typical Group Size</u> | <u>Freq. of Occur. Single Individuals</u> |
|-----------------------------------|--------------------------------|------------------------------------|-------------------------------------|--|---|-------------------------------------|--------------------------------------|---------------------------------|---------------------------|---|
| <i>Delphinapterus leucas</i>      | White Whale                    | 160                                | 130-160                             | 216  | 250   | 2                                   | 250                                  | 300-400 F<br>400-450 M          | up to hundreds            | uncommon                                  |
| <i>Delphinus capensis</i>         | Long-beaked Saddleback Dolphin | < 100                              |                                     |  |   |                                     |                                      |                                 | up to thousands           | uncommon                                  |
| <i>Delphinus delphis</i>          | Common Dolphin                 | 80-90                              | 80-100                              |  |   |                                     | 110-120                              | 230-250                         | up to thousands           | uncommon                                  |
| <i>Feresa attenuata</i>           | Pygmy Killer Whale             | 80                                 |                                     |  |   |                                     |                                      | 240-270                         | 1-70                      | occasional                                |
| <i>Globicephala macrorhynchus</i> | Short-finned Pilot Whale       | 140-185                            | 150                                 |  |   | 2-3                                 |                                      | 400-500 F<br>500-600 M          | up to several hundred     | rare                                      |
| <i>Globicephala melas</i>         | Long-finned Pilot Whale        | 177                                | 160-200                             |  |   | 2-3                                 | 240                                  | 450-500 F<br>450-600 M          | up to several hundred     | rare                                      |
| <i>Grampus griseus</i>            | Risso's Dolphin                | 110-150                            | 120-160                             |  |   |                                     |                                      | 300-400                         | single to several hundred | occasional                                |
| <i>Kogia breviceps</i>            | Pygmy Sperm Whale              | 120                                | 100-120                             |  |   | 1                                   |                                      | 300 - 370                       | 1-6                       | not uncommon                              |
| <i>Kogia sima</i>                 | Dwarf Sperm Whale              | 95                                 | 100                                 |  |   | 1                                   |                                      | 210-270                         | 1-10                      | not uncommon                              |
| <i>Lagenodelphis hosei</i>        | Fraser's Dolphins              | 100                                | 100                                 |  |   |                                     |                                      | 240                             | 100-1000                  | uncommon                                  |
| <i>Lagenorhynchus acutus</i>      | Atlantic White-sided Dolphin   | 108-122                            | 100-130                             | 142-156                                    | 176-190                                     | 1.5                                 | 180                                  | 240-270                         | 2-500                     | uncommon                                  |
| <i>Lagenorhynchus albirostris</i> | White Beaked Dolphin           | 110-120                            | 110-130                             |  |   |                                     |                                      | 300-320                         | 1-100 (to 1500)           | occasional                                |
| <i>Lagenorhynchus obliquidens</i> | Pacific White-sided Dolphin    | 92                                 | 80-100                              |  |   |                                     |                                      | 220-230                         | tens to thousands         | uncommon                                  |
| <i>Lissodelphis borealis</i>      | Northern Right Whale Dolphin   | 80-100                             | 80-100                              |  |   |                                     |                                      | 220-230 F<br>260-300 M          | 100-200                   | occasional                                |
| <i>Mesoplodon densirostris</i>    | Blainville's Beaked Whale      | 200                                |                                     |  |   |                                     |                                      | 450-470                         | 1-7                       | occasional                                |
| <i>Mesoplodon europaeus</i>       | Gervais' Beaked Whale          | 210                                | 210                                 |  |   |                                     |                                      | 450-520                         | small groups              | uncommon                                  |
| <i>Orcinus orca</i>               | Killer Whale                   | 183-228                            | 210-250                             |  |   | 1.5-2.0                             | 400                                  | 700-800 F<br>800-950 M          | 2-100                     | infrequent - adult males                  |
| <i>Peponocephala electra</i>      | Melon-Headed Whale             | 100                                |                                     |  |   |                                     |                                      | 270                             | 150-1500                  | uncommon                                  |
| <i>Phocoena phocoena</i>          | Harbor Porpoise                | 70                                 | 70-90                               | 110-135                                    | 115-155                                     | 0.3 - 1.0                           | 100 - 110                            | 140-170                         | small groups              | not uncommon                              |
| <i>Phocoenoides dalli</i>         | Dall's Porpoise                | 100                                | 100                                 |  |   | 0.3-2.0                             |                                      | 180-220                         | 2-12                      | uncommon                                  |

| <u>Scientific Name</u>        | <u>Common Name</u>          | <u>Approx Length at Birth (cm)</u> | <u>Approx "NEONATE" length (cm)</u> | <u>Approx Length at 1 Year of Age (cm)</u> | <u>Approx Length at 2 Years of Age (cm)</u> | <u>Approx. Age at Weaning (yrs)</u> | <u>Approx Length at Weaning (cm)</u> | <u>Aprox. Adult Length (cm)</u>         | <u>Typical Group Size</u> | <u>Freq. of Occur. Single Individuals</u> |
|-------------------------------|-----------------------------|------------------------------------|-------------------------------------|--|---|-------------------------------------|--------------------------------------|---|---------------------------|---|
| <i>Physeter macrocephalus</i> | Sperm Whale                 | 400                                | 350-500                             |  | 670   | 2+                                  | 670                                  | 1100-1300 F<br>1500-1800 M              | 20-40 (50)                | adult males                               |
| <i>Pseudorca crassidens</i>   | False Killer Whale          | 160                                | 170-200                             |  |   | 1.5-2.0                             |                                      | 500 F<br>550-600 M                      | 10-20+                    | rare                                      |
| <i>Stenella attenuata</i>     | Pantropical Spotted Dolphin | 85                                 | 80-100                              | 129-142                                    |   | 1-2                                 | 140                                  | 120                                     | <100 to thousands         | uncommon                                  |
| <i>Stenella clymene</i>       | Clymene Dolphin             |                                    |                                     |  |   |                                     |                                      | 180-200                                 | 1-50                      | occasional                                |
| <i>Stenella coeruleoalba</i>  | Striped Dolphin             | 93-100                             | 100                                 | 166  | 180   |                                     | 170                                  | 220-260                                 | 10-100s                   | uncommon                                  |
| <i>Stenella frontalis</i>     | Atlantic Spotted Dolphin    | 100                                | 80-120                              |  |   |                                     | 140                                  | 200-230                                 | 1-15                      | uncommon                                  |
| <i>Stenella longirostris</i>  | Spinner Dolphin             | 76-77                              | 70-80                               | 133-137                                    |   | 1-2                                 |                                      | 180-220                                 | up to thousands           | uncommon                                  |
| <i>Steno bredanensis</i>      | Rough-toothed Dolphin       | 100                                |                                     |  |   |                                     |                                      | 240-270                                 | 10-20                     | uncommon                                  |
| <i>Tursiops truncatus</i>     | Bottlenose Dolphin          | 117                                | 100-130                             | 170-200                                    | 170-225                                     | 1.5-2.0                             | 225                                  | 220-300 (coastal)<br>250-650 (offshore) | 2-15                      | occasional                                |
| <i>Ziphius cavirostris</i>    | Cuvier's Beaked Whale       | 270                                | 200-300                             |  |   |                                     |                                      | 670 - 700                               | 1-7                       | not uncommon                              |

**Information sources:**

**Handbook of Marine Mammals, ed. By S.H. Ridgeway and R. Harrison**

**Marine Mammals Ashore. 1998. Geraci and Lounsbury**