APPENDIX A
MMHSRP POLICIES AND BEST PRACTICES

NATIONAL TEMPLATE

MARINE MAMMAL STRANDING AGREEMENT BETWEEN

NATIONAL MARINE FISHERIES SERVICE OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION DEPARTMENT OF COMMERCE

AND

[Stranding Network Organization]

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Shaded denotes reserved text at the discretion of the NMFS Regional Administrator

Articles III, IV, V, and VI are reserved and issued at the discretion of the NMFS Regional Administrator.

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ARTICLE I
General Provisions

A. Authority

1. This Marine Mammal Stranding Agreement (hereinafter Agreement) is entered into between the Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS)[*insert* Regional Office], and the Stranding Network Participant [*insert* Stranding Network Organization] (Participant), under the authority of section 112(c) and section 403 of the Marine Mammal Protection Act of 1972 (MMPA), as amended. **This Agreement supersedes all pre-existing Stranding Agreements between these parties. An organizational representative with signatory authority (e.g. Executive Director, President, CEO) must sign this Agreement on behalf of the Stranding Network Organization.**

2. NMFS has been delegated authority by the Department of Commerce to administer the MMPA. To assist in the implementation and administration of the MMPA, the Stranding Network has been established to respond to stranded marine mammals within NMFS' [*insert* Region] of the United States. The [*insert* Region] consists of the following coastal states and territories: [*List* states/territories].

B. Scope

1. Under the MMPA, NMFS is responsible for mammals of the **Order Cetacea** and the **Order Pinnipedia** other than walruses (hereinafter marine mammals).

2. The geographic response area assigned to Participant consists of the following: [(*list* response area including primary and secondary geographic response areas as necessary)]. The Participant may assist in stranding response within the Region outside of their assigned response area, if requested by NMFS or by another Participant. Outside the [*insert* Region], the Participant may assist with stranding response upon request from the appropriate regional NMFS Regional Stranding Coordinator(s).

C. Limitations

1. This Agreement creates an authorization for the Participant to take marine mammals, which would be otherwise prohibited by the MMPA. This taking authorization only applies to the Participant and its authorized personnel (see Article VI) for activities that are consistent with this Agreement.

2. In particular, this Agreement does <u>not</u> authorize:

    a. The taking of any marine mammal species listed as endangered or threatened under the Endangered Species Act of 1973 (ESA), as amended. Authorization to

take ESA listed species is provided under an MMPA/ESA Permit No. 932-1489-09, as amended, issued to the NMFS National Marine Mammal Health and Stranding Response Program Coordinator and requires authorization and direction from the NMFS Regional Stranding Coordinator in the event of a stranding involving a threatened or endangered marine mammal.

b. The sale or offer of sale of any marine mammal or marine mammal parts including cells, gametes, or cell cultures.

D. Definitions

All terms used in the Agreement shall be interpreted to have the meaning specified in the MMPA section 3 and section 409 and NMFS implementing regulations 50 CFR 216.3 unless the context or specific language requires otherwise. For ease of reference, those definitions, as well as additional terms and definitions for this Agreement, are provided in Attachment A.

ARTICLE II
Purpose and General Responsibilities

A. Purpose of Agreement. NMFS and the Participant enter into this Agreement for the following purposes:

1. To provide for rapid response and investigation of stranded marine mammals *[insert* taxa*]* within the [*insert* Region] in accordance with the purposes and policies of the MMPA.

2. To implement Title IV (Marine Mammal Health and Stranding Response Program) of the MMPA:

    a. to facilitate the collection and dissemination of reference data on the health of marine mammals and health trends of marine mammal populations in the wild;

    b. to correlate the health of marine mammals and marine mammal populations in the wild with available data on physical, chemical, and biological environmental parameters; and

    c. to detect and coordinate effective responses to Marine Mammal Unusual Mortality Events (UMEs).

3. To specify the activities during which the Participant may take stranded marine mammals [*insert* taxa] or marine mammal parts for the primary purpose of ensuring the appropriate response, [rehabilitation], disposition, and utilization of stranded marine mammals or marine mammal parts under MMPA sections 109(h), 112(c), and 403 and the Agreement.

4. To define the nature and extent of services that the Participant will provide NMFS under this Agreement and NMFS' responsibilities to the Participant.

5. To specify the requirements for the preparation and maintenance and reporting of records containing scientific data obtained from dead and live stranded marine mammals or parts from dead stranded marine mammals.

6. To provide for the timely exchange of information for use by both parties and other network members in furthering the objectives of the MMPA under this Agreement.

B. Joint Responsibilities

NMFS and the Participant will work cooperatively to:

1. Implement Title IV of the MMPA;

2. Effectively respond to and investigate the causes and impacts of UMEs;

3. Collect the appropriate data for determination of serious injuries and mortalities due to human interactions;

4. Collect reference data on marine mammal health and diseases;

5. Collect data on the frequency and causes of strandings; and

6. Interpret findings and identify health trends and diseases of concern to include emerging, reportable, and zoonotic diseases.

C. NMFS Responsibilities

NMFS Shall:

1. Provide the Participant with notice of any changes to laws, regulations, policies and/or guidelines applicable to or promulgated by NMFS that may apply to the Participant's activities. This includes criteria for issuance, renewal and termination of stranding agreements. Notwithstanding this provision, it is the responsibility of the Participant to comply with all laws, regulations, policies and/or guidelines that apply to the Participant's activities.

2. Conduct periodic (R*eserved* annual) compliance reviews of Stranding Agreements as stated in Article IX.

3. Provide guidance and assistance regarding investigation of marine mammal unusual mortality events including financial and physical resources (example: NOAA laboratory assistance) and financial resources when available and authorized (in accordance with section 405 of the MMPA – UME National Contingency Fund) and in coordination with the Working Group on Marine Mammal Unusual Mortality Events.

4. Alert the Participant when NMFS has been notified that there are diseases of concern that are emerging, reportable, and/or zoonotic within the [*insert* Region].

5. Pursuant to criteria established under the MMPA section 407, provide access to the National Marine Mammal Health and Stranding Response Program Database, as developed, and access to marine mammal tissues in the National Marine Mammal Tissue Bank following NMFS data and tissue access procedures and policies.

6. As needed and as resources are available, provide specialized marine mammal stranding response and investigation training on a local, regional or national basis.

7. Pursuant to MMPA section 402, collect and update periodically and make available to stranding network participants and other qualified scientists, existing information on:

   a. procedures and practices for rescuing and rehabilitating stranded marine mammals;

   b. species by species criteria used by the stranding network participants, for determining at what point a marine mammal undergoing rescue and rehabilitation is returnable to the wild based on its ability to survive in the wild and risk to the wild population of marine mammals;

   c. procedures and practices for collecting, preserving, labeling, and transporting marine mammal tissues for physical, chemical, and biological analyses;

   d. relevant scientific literature on marine mammal health, disease, and rehabilitation;

   e. compilation and analyses of strandings by region to monitor species, numbers, conditions, and causes of illness and death in stranded marine mammals; and

   f. other life history and reference level data, including marine mammal tissue analyses that would allow comparison of the causes of illness and death in stranded marine mammals with physical, chemical, and biological environmental parameters.

8. Identify a Stranding Coordinator who will serve as the Participant's primary point of contact for notification, coordination, reporting, and response [and rehabilitation] activities as specified throughout this Agreement. The NMFS Regional Administrator will serve as the Participant's primary point of contact for administration of the Agreement, as well as dispositions and other management activities as specified throughout the Agreement. The NMFS Regional Administrator's designated point of contact for this Agreement is the NMFS Stranding Coordinator; [Regional stranding coordinator or administrator, Regional Office, Protected Resources Division] (see Attachment B for contact information).

9. In certain circumstances such as large scale events (e.g. mass stranding, unusual mortality events, live right whale stranding), NMFS may establish a formal Incident Command System (ICS) for response, including the identification of an Incident Commander. Events such as oil spills, NMFS will follow direction from United States Coast Guard (USCG). Opportunities for ICS training can be accessed through the Federal Emergency Management Agency (see http://www.training.fema.gov/EMIWeb/IS/is100.asp), USCG, or NMFS. If necessary, guidance will be provided by NMFS on a case-by-case basis.

10. Relay reports of stranded marine mammals (live or dead) within the Participant's geographic range to the Participant and inquire whether the Participant has the capability to respond. If the Participant cannot respond, the Stranding Coordinator may make requests to other regional Stranding Participants to respond.

11. Coordinate regional activities to maximize geographic coverage while facilitating appropriate division of responsibilities among regional Participants according to institutional abilities and authorities.

12. Respond to the Participant's completed requests for authorizations such as requests for parts authorizations, parts transfers, and release determinations.

13. Provide information regarding availability of Prescott Grants and any other relevant NMFS funding opportunities.

14. [*Reserved* {For emergency stranding events (live or dead), provide and maintain a 24-hour stranding hotline number: ### ###-####. NMFS shall also provide and maintain a backup stranding pager number:### ###-####.}]

D. Participant Responsibilities

The Participant shall:

1. Comply with laws, regulations, policies and/or guidelines applicable to or promulgated by NMFS that apply to activities under this Agreement; or any Federal, state or municipal laws that pertain to stranding network operations (e.g., municipal water management laws).

2. Cooperate with other members of the [*insert* Region] Stranding Network and the National Marine Mammal Stranding Program as well as Federal, state, and local officials and employees in matters supporting the purposes of this Agreement.

3. Be subject to the direction of a designated employee (e.g., NMFS Marine Mammal Stranding Coordinator or NMFS Special Agent) representing the NMFS [*insert* Region] Regional Administrator or Office of Law Enforcement with respect to the taking of a stranded marine mammal.

4. Manage any and all expenses that the Participant incurs associated with the activities authorized by this Agreement. NMFS does not have funds to reimburse volunteers for expenses incurred in responding to stranding events. However under the marine mammal UME process, funding may be available for costs associated with specific analyses and additional requests in accordance with section 405 of the MMPA UME National Contingency Fund and in coordination with the Working Group on Marine Mammal Unusual Mortality Events. Additionally, competitive funding opportunities for Stranding Network Participants may be available through the Prescott Stranding

Assistance Grant Program (see http://www.nmfs.noaa.gov/pr/health/prescott/).

5. Promote human and public safety by taking precautions against injury or disease to any network personnel, volunteers, and the general public when working with live or dead marine mammals.

6. Notify [immediately or] within 24 hours the NMFS Stranding Coordinator of learning of any diseases of concern (e.g., emerging, reportable, and/or zoonotic diseases) that are detected and/or confirmed that could be a potential hazard for public health or animal health (NMFS will provide guidance on reportable diseases as it becomes available);

7. Transfer of marine mammal parts (50 CFR 216.22 and 216.37):

   a. Non-diagnostic parts, tissues, cells, gametes, or cell cultures to be used for scientific research, species enhancement, or education shall be transferred only to persons or labs that have received prior written authorization from the NMFS MMPA/ESA scientific research permit or a Regional Authorization. A unique field number assigned by NMFS (e.g., NMFS Registration Number) or the Participant must be marked on or affixed to the marine mammal part or container.

   b. Diagnostic parts, tissue samples, fluid specimens, parts, or cells may be transferred to labs within the United States for diagnostic use without any additional authorizations.

8. Work cooperatively with the NMFS and the USCG in a hazardous waste spill (i.e., oil spills) ICS if implemented.

9. Notify the NMFS Regional Administrator in writing within 30 days of any changes in its Designee organizations, key personnel (see Attachment A), capabilities, and/or geographic area of response.

10. If requested, the Participant shall coordinate with NMFS to develop and implement a media plan relating to stranding events.

11. Photo documenting (still or video) for other than diagnostic or identification purposes (such as dorsal fin identification, documentation of lesions, scars, etc.) must not interfere or influence the conduct of the stranding responders and response in any way or cause additional harassment to marine mammals.

12. If requested by the NMFS Regional Stranding Coordinator, the Participant will provide copies of any photographs, films, and/or videotapes documenting any stranding, particularly for those strandings when human interactions are reported or suspected. Reimbursement for this request is subject to negotiation between NMFS and the Participant. Any photography, film and/or videotape of the stranding response used for educational or

commercial purposes of stranding response should by the Participant should include a credit, acknowledgment, or caption indicating that the stranding response was conducted under a Stranding Agreement between NMFS and the Participant under the authority of the MMPA. NMFS will not reproduce, modify, distribute, or publicly display the photograph, film, and/or videotape without consent of the owner, unless required to release a copy under Federal law or order (such as the Freedom of Information Act).

13. By its nature, the handling of stranded marine mammals (dead or alive) is potentially a dangerous activity. The Participant shall indemnify and hold harmless the United States Government from any and all losses, damages, or liability -or claims therefore -on account of personal injury, death, or property damage of any nature whatsoever, arising out of the activities of the Participant, his/her/its employees, his/her/its qualified representatives, designees, subcontractors, volunteers, or agents. Liability for person(s) acting under this agreement is addressed in sections 406(a) and (b) of the MMPA [16 U.S.C. 1421(e)].

14. Provide accurate and honest information in all reports to NMFS.

15. Except where a longer period is specified (e.g., 15 years for rehabilitation cases, see Attachment D *NMFS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standard for Rehabilitation Facilities*), maintain records upon which required reports are based for at least 3 years on-site.

16. Upon request by the NMFS Regional Administrator, allow the Regional Stranding Coordinator, other appropriate NMFS employees, or any other appropriate person duly designated by the Regional Administrator, to inspect the facilities and inspect and/or request records that pertain to stranding network activities.

17. [*Reserved* Verbally report any right whale sightings that occur or are reported as part of their normal activities. See Attachment B for contact information.

ARTICLE III
Dead Animal Response

Reserved
OR

A. The Participant may take species of marine mammals under the MMPA for the purpose of dead animal investigation and response.

Subject to the conditions contained in this Agreement, the MMPA, and the implementing regulations, the Participant may take dead stranded marine mammals or parts therefrom for the collection of data on the health and health trends of wild populations, for the detection of marine mammal UMEs, for the detection of signs of human interaction, for research or education on marine mammal biology and life history, for the determination of cause of death, for the detection of human caused and natural mortality, or for other research as deemed appropriate by the NMFS. These activities specifically include: obtaining measurements and biological samples from dead stranded marine mammals; disposing, or assisting in the disposal, of dead stranded marine mammals at an appropriate landfill or other suitable location; and taking and transporting dead stranded or floating dead marine mammals, or parts therefrom, to facilities or individuals approved pursuant to 50 CFR. 216.22 for scientific research, maintenance in a properly curated, professionally accredited scientific collection, or for educational purposes.

B. Terms and Conditions for Dead Animal Response

1. Response

a. The Participant shall respond as practicable to reports of dead stranded marine mammals within the geographic range or response specified under Article I, Number B.2. [*Reserved* {If the Participant is the closest and/or first responder, the Participant is considered to be the on-site coordinating organization and is in charge of all on-site activities.}] In certain circumstances such as a UME, mass stranding, or endangered marine mammal stranding, NMFS may implement the ICS structure and designate an on-site coordinator to be in charge of the event (see Article II C9). In all situations, the Participant will cooperate with Federal, state and local government officials and employees and other stranding network participants when responding to these strandings. If the Participant receives a verified report of a dead stranded marine mammal and does not have the capability to respond appropriately to the report, the Participant shall notify the NMFS Regional Stranding Coordinator and/or adjacent stranding network participants within 24 hours if feasible.

b. If the Participant leaves a dead animal at the stranding site or in thecase of a UME or mass stranding response, the Participant shall, if feasible, mark each animal with a tag or mark, such as roto-tags or grease stick, to assist with data collection and to prevent multiple reports on the same animal(s).

c. If requested by NMFS Regional Stranding Coordinator and if feasible and practicable, the Participant will assist with stranding response in neighboring areas outside the Participant geographic range (specified in Article I B2).

2. Data Collection and Reporting. The Participant shall collect and provide the following information for each stranded marine mammal they respond to:

a. Complete the NOAA Form 89-864, OMB #0648-0178 (the Marine Mammal Stranding Report - "Level A" Form) for each stranded marine mammal. Completed forms shall be sent to the NMFS Regional Stranding Coordinator via the NMFS National Marine Mammal Stranding Database or in writing (see Attachment B), no later than 30 days after responding to the stranding event. If requested by the NMFS Regional Stranding Coordinator and if feasible, the Participant shall provide preliminary data (verbal or written) from the Level A - Marine Mammal Stranding Report within 24 hours.

b. As resources are available, collect additional Level B and Level C data.

c. Notify the Regional Stranding Coordinator of the following cases [immediately or] within 24 hours or according to the specific reporting guidance provided by the Stranding Coordinator:

1). possible or confirmed human interactions (including military activity),
2). suspected UMEs,
3). extralimital or out-of-habitat situations,
4). mass stranding events and/or mass mortalities,
5). large whale strandings, and
6). any stranding involving endangered or threatened species or identified species of concern [*list* species]

d. In certain circumstances (e.g., listed or rare species stranding, UME, possible human interaction case, extralimital or out-of-habitat situation), the NMFS Regional Stranding Coordinator may request necropsies be conducted by a Necropsy Team Leader, or that additional and expedited reporting (verbal or written) of Level B and C data such as analytical results and necropsy reports if available. NMFS will not reproduce, modify, distribute, or publish the data without consent of the Participant unless required to release the data under Federal law or order (such as the Freedom of Information Act);

e. Collect and make available any gear, debris, or other objects (e.g., bullets, arrows, net webbing, etc.) recovered from a stranded marine mammal that may be evidence of human interaction. The Participant must comply with chain of custody procedures or any other instructions as specified and supported by NMFS [*insert* Region] and/or NMFS Office of Law Enforcement personnel.

3. Parts Disposition. Diagnostic parts, tissue samples, fluid specimens, parts or cells may be transferred to labs within the United States for diagnostic use without any additional authorizations. For non-diagnostic parts or samples:

a. Retention: Marine mammal parts may be retained by the Participant for education and/or research purposes, provided they are properly indicated in the "Specimen Disposition" field of NOAA Form 89-864, OMB #0648-0178 (the Marine Mammal Stranding Report - "Level A" Form). Parts and/or containers must be marked with the field identification number assigned by the Participant or by NMFS (i.e., NMFS registration number). Authorization to take parts from ESA listed species in the [*insert* Region] is currently provided under MMPA/ESA Permit No. 932-1489-09, as amended, issued to the NMFS Marine Mammal Health and Stranding Response Program Coordinator, and requires authorization and direction from the NMFS Regional Stranding Coordinator in the event of a stranding involving a threatened or endangered marine mammal, prior to any action by the Participant.

b. Transfer: Report to the NMFS Regional Administrator (See Attachment B) within 30 days of the stranding event, the transfer of any parts salvaged from the stranded marine mammal collected under this Agreement as required by 50 CFR 216.22 [or 50 CFR 216.37]. The Participant must provide the institution name where specimen materials have been deposited and ensure that the retained or transferred parts are marked with the field identification number or assigned NMFS Registration number in the "Specimen Disposition" field on the NOAA Form 89864, OMB #0648-0178 (the Marine Mammal Stranding Report – Level "A" Form) and ensure that retained or transferred parts are marked with the field identification number or the NMFS Registration Number. If parts are being transferred, the Participant must ensure the receiving institution is authorized by the NMFS Regional Administrator to receive marine mammal parts.

4. Site cleanup. The Participant shall make every reasonable effort to assist in the clean up of beach areas where their activities (e.g., necropsy or specimen collection) under this Agreement that may contribute to soiling of the site.

ARTICLE IV
Live Animal Response: First Response

Reserved
OR

A. The Participant may take species of marine mammals covered under the MMPA for the purpose of live stranding first response (initial assessment and care at the site of stranding and assist in the appropriate disposition of the animal), beach triage, beach release, temporary holding for assessment and triage, translocation and/or transportation to a NMFS authorized rehabilitation center within the [*insert* Region].

1. The Participant must take live stranded marine mammals in a humane manner (as defined in 50 CFR 216.3, see Attachment A) for the protection or welfare of the marine mammal. [*Reserve for those w/ Article III authorization:* If the animal dies during the course of response and/or investigation, then the terms and responsibilities contained in Article III of this Agreement become operative.] In addition to the activities authorized in Articles I, II, (*reserved* Article III), the Participant is authorized to implement the following activities under this article:

    a. Take measurements and collecting blood or other diagnostic samples from live stranded marine mammals for health assessment.

    b. Return live stranded marine mammals, as directed by the NMFS Regional Stranding Coordinator, to their natural habitat and tagging such animals

    c. Transport live stranded marine mammals for rescue and rehabilitation to a NMFS approved rehabilitation facility or temporary holding facility.

    d. Perform humane euthanasia. Euthanasia shall only be performed by the attending veterinarian or by a person acting under the direction of the attending veterinarian and following approved guidelines such as those referenced in Attachment C (*2007 Report of the American Veterinary Medical Association Panel on Euthanasia*, *2nd Edition of the CRC Handbook of Marine Mammal Medicine*, *2006 Journal of the American Association for Zoo Veterinarians*). When using controlled drugs, such person(s) shall comply with all applicable state and Federal laws and regulations (i.e., registered with the Drug Enforcement Administration). Authorization for euthanasia of ESA-listed species provided under MMPA/ESA Permit No. 932-1489-09, as amended, and requires prior approval and direction from the NMFS Regional Stranding Coordinator.

2. This Agreement does not authorize any projects involving "intrusive research" (as defined in 50 CFR 216.3). Measurements or sampling for scientific research purposes (i.e., outside the scope of accepted diagnostic and treatment practices for the care of an

animal) must be authorized under a NMFS MMPA/ESA scientific research permit.

B. Terms and Conditions for Live Stranding: First Response

1. **Response**

a. The Participant shall respond to reports of live stranded marine mammals [R*eserved* for taxa and schedule]. [*Reserved* {If the Participant is the closest and/or first responder, the [Participant acronym] is considered to be the on-site coordinator and is in charge of all on-site activities.}] In certain circumstances such as a UME, mass stranding, or endangered marine mammal stranding, NMFS may implement the ICS structure and designate an on-site coordinator to be in charge of the event (see Article II C9). In all situations, the Participant will cooperate with Federal, state and local government officials and employees and other stranding network participants when responding to these strandings. If the Participant receives a verified report of a live stranded marine mammal and does not have the capability to respond appropriately to the report, the Participant shall notify the NMFS Regional Stranding Coordinator without delay. Also, if the NMFS Regional Stranding Coordinator receives a report of a live stranded marine mammal, the Regional Stranding Coordinator may contact the Participant to determine whether the Participant has the capability to respond to the stranding. If the Participant cannot respond in a timely manner, the NMFS Regional Stranding Coordinator may request another Stranding Network participant to respond.

b. The Participant shall take all steps reasonably practicable under the circumstances to prevent further injury to any live stranded marine mammal, injury to any network personnel, volunteers, government personnel and the general public.

c. The Participant shall tag or mark any animals that are immediately released to their natural habitat using a NMFS approved tag, such as one-bolt roto tag, cattle ear tags, or freeze branding. Application of other tagging methods must first be approved by the NMFS Regional Stranding Coordinator. Tagging and post-tagging activities are restricted to monitoring the success of marine mammals released to the wild. Any projects outside the scope of monitoring the success of a release must be authorized under a NMFS MMPA/ESA scientific research permit.

d. If the Participant determines that it is necessary to temporarily hold or triage a stranded marine mammal at a separate site from the NMFS approved rehabilitation facility, the animal(s) cannot be moved until the Participant obtains verbal approval from the NMFS Regional Stranding Coordinator.

Written documentation of the need for an interim location and written concurrence from the NMFS Regional Stranding Coordinator with any associated conditions must be provided at the earliest time practicable within 24 hours.

e. If the Participant considers responding to an "out-of-habitat" or free-swimming marine mammal [*Reserve:* replace marine mammal with listed species and cetaceans; or listed species and pinnipeds, or listed species] in distress (e.g., entanglement), the Participant must first contact the NMFS Regional Stranding Coordinator for approval and discuss plans for live capture and/or needs for assistance. The NMFS Regional Stranding Coordinator may require a NMFS employee to be present at the time of capture.

f. [*Reserved {*The Participant shall follow the guidance provided by the [*insert* Region] in Attachment E, Disposition of Live Stranded Marine Mammals, and shall consult with the NMFS Stranding Coordinator and the attending veterinarian to make a determination regarding immediate release, rehabilitation, or euthanasia of live stranded marine mammals or cetaceans}].

2. **Data Collection and Reporting.** The Participant shall collect and provide the following information for each stranded marine mammal they respond to:

a. Complete the NOAA Form 89-864, OMB #0648-0178 (the Marine Mammal Stranding Report - "Level A" Form) for each stranded marine mammal. Completed forms shall be sent to the NMFS Regional Stranding Coordinator via the NMFS National Marine Mammal Stranding Database or in writing (see Attachment B), no later than 30 days after responding to the stranding event. If requested by the NMFS Regional Stranding Coordinator and if feasible, the Participant shall provide preliminary data (verbal or written) from the Level A - Marine Mammal Stranding Report within 24 hours.

b. If temporarily holding a stranded animal prior to transferring to a NMFS approved rehabilitation facility acting in accordance with this Article, the Participant shall complete the NOAA Form 89878, OMB # 0648-0178 (the Marine Mammal Rehabilitation Disposition Report). This report shall be sent to the NMFS Regional Stranding Coordinator via the NMFS National Marine Mammal Stranding Database or in writing (see Attachment B), no later than 30 days after responding to the stranding event. If requested by the NMFS Regional Stranding Coordinator and if feasible, the Participant shall provide preliminary data (verbal or written) from the Marine Mammal Rehabilitation Disposition Form within 24 hours.

c. As resources are available, collect additional Level B and Level C data.

d. Notify the NMFS Regional Stranding Coordinator of the following cases [immediately or] within 24 or according to the specific reporting guidance provided by the Stranding Coordinator:

1). possible or confirmed human interactions (including military activity),
2). suspected UMEs,
3). extralimital or out-of-habitat situations (see B.1.e. of this Article),
4). mass stranding events and/or mass mortalities,
5). large whale strandings, and
6). any stranding involving endangered or threatened species or identified species of concern [*list* species]

e. In certain circumstances (e.g., UME, possible human interaction case, extralimital or out-of-habitat situation), the NMFS Regional Stranding Coordinator may request additional and expedited reporting (verbal or written) of Level B and C data such as analytical results and necropsy reports if available. NMFS will not reproduce, modify, distribute, or publish the data without consent of the Participant unless required to release the data under Federal law or order (such as the Freedom of Information Act);

f. Collect and make available any gear, debris, or other objects (e.g., bullets, arrows, net webbing, etc.) recovered from a stranded marine mammal that may be evidence of human interaction. The Participant must comply with chain of custody procedures or any other instructions as specified and supported by NMFS [*insert* Region] and/or NMFS Office of Law Enforcement personnel.

[*Reserved for those without Article III authorization:*

3. Parts Disposition. Diagnostic parts, tissue samples, fluid specimens, parts or cells may be transferred to labs within the United States for diagnostic use without any additional authorizations. For non-diagnostic parts or samples:

a. Retention: Marine mammal parts may be retained by the Participant for education and/or research purposes, provided they are properly indicated in the "Specimen Disposition" field of NOAA Form 89-864, OMB #0648-0178 (the Marine Mammal Stranding Report - "Level A" Form). Parts and/or containers must be marked with the field identification number assigned by the Participant or by NMFS (i.e., NMFS registration number). Authorization to take parts from ESA listed species in the [*insert* Region] is currently provided under MMPA/ESA Permit No. 932-1489-09, as amended, issued to the NMFS Marine Mammal Health and Stranding Response Program Coordinator, and requires authorization and direction from the NMFS Regional Stranding Coordinator in the event of a stranding involving a threatened or endangered marine mammal, prior to any action by the Participant.

b. Transfer: Report to the NMFS Regional Administrator (See Attachment B) within 30 day of the stranding event, the transfer of any parts salvaged from the stranded marine mammal collected under this Agreement as required by 50 CFR 216.22 [or 50 CFR 216.37.] The Participant must provide the institution name where specimen materials have been deposited and ensure that the retained or transferred parts are marked with the field identification number or assigned NMFS Registration number in the "Specimen Disposition" field on the NOAA Form 89864, OMB #0648-0178 (the Marine Mammal Stranding Report – Level "A" Form) and ensure that retained or transferred parts are marked with the field identification number or the NMFS Registration Number. If parts are being transferred, the Participant must ensure the receiving institution is authorized by the NMFS Regional Administrator to receive marine mammal parts.

4. Site Cleanup. The Participant shall make every reasonable effort to assist in the clean up of beach areas where their activities (e.g., euthanasia, necropsy, or specimen collection) under this Agreement.

ARTICLE V
Live Animal Response: Rehabilitation and Final Disposition
Reserved
OR

A. The Participant may take live stranded marine mammals in a humane manner with the goal of rehabilitation and release. If the animal dies during the course of rehabilitation, then the terms and responsibilities contained in Article III of this Agreement become operative. In addition to the activities authorized in Articles I, II, (*reserved* III, IV) of this Agreement and subject to the conditions contained in this Agreement, the MMPA, and the implementing regulations, the Participant is authorized to implement the following activities under this article:

1. In accordance with applicable regulations and NMFS guidelines and best practices, transfer marine mammals to another NMFS approved rehabilitation facility within the [Region] for:

    a. release back to the wild;

    b. temporary placement in a scientific research facility holding a current NMFS scientific research permit and a United States Department of Agriculture Animal and Plant Health Inspection Service (APHIS) Research License; or

    c. permanent disposition at an authorized facility (i.e. holds an APHIS exhibitors license {7 U.S.C. 2131 *et seq.*}) after consultation with, and authorization by, the NMFS Office of Protected Resources Permits, Conservation and Education Division.

2. Conduct scientific research on stranded animals in a rehabilitation facility, only if the responsible individual has a NMFS scientific research permit and the facility holds an APHIS research license in accordance with the Animal Welfare Act (see 50 CFR 216.27 (c)(6)).

3. Return rehabilitated stranded marine mammals to their natural habitat. A decision regarding whether or not a marine mammal has the potential to be released must be made as early as possible during the rehabilitation period. Any marine mammal eligible for release must be released as early as possible and no later than six months after being taken for rehabilitation unless the attending veterinarian determines that: the marine mammal might adversely affect marine mammals in the wild; release is unlikely to be successful due to the physical condition and behavior of the marine mammal; or more time is needed to make a determination. Release plans must be submitted to the NMFS Regional Administrator at least 15 days prior to the release, unless advanced notice is waived by the NMFS Regional Administrator. The NMFS Regional Administrator may require the participant to provide additional information, modify the release plan, or dispose of the marine mammal in another manner (see 50 CFR 216.27(a) and the

NMFS/FWS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release.)

4. Tag rehabilitated stranded marine mammals, strictly for purposes of monitoring success of release to the wild using a NMFS approved tag, such as one-bolt roto-tag, cattle ear tags, or freeze branding. Application of other tagging methods must first be approved by the NMFS Regional Stranding Coordinator. Tagging and post-tagging activities are restricted to monitoring the success of marine mammals released to the wild. Any projects outside the scope of monitoring the success of a release must be authorized under a NMFS MMPA/ESA scientific research permit.

5. Perform humane euthanasia. Euthanasia shall only be performed by the attending veterinarian or by a person acting under the direction of the attending veterinarian and following approved guidelines such as those referenced in Attachment C (*2007 Report of the American Veterinary Medical Association Panel on Euthanasia, 2nd Edition of the CRC Handbook of Marine Mammal Medicine, 2006 Journal of the American Association for Zoo Veterinarians*). When using controlled drugs, such person(s) shall comply with all applicable state and Federal laws and regulations (i.e., registered with the Drug Enforcement Administration). Authorization for the euthanasia of ESA-listed species provided under MMPA/ESA Permit No. 932-1489-09, as amended, and requires prior approval and direction from the NMFS Regional Stranding Coordinator.

B. Terms and Conditions for Live Animal Response: Rehabilitation, Release, or Final Disposition Determination

1. Rehabilitation

a. The Participant shall comply with laws, regulations, policies, and/or guidelines applicable to or promulgated by NMFS that apply to activities under this Agreement. The Participant must also have all applicable Federal, state, and local permits for rehabilitation facilities, and must comply with all Federal, state, and municipal laws related to operations of the facility.

b. The Participant shall be responsible for the custody of any living marine mammal taken pursuant to this Article using standards for humane care and for practicing accepted medical evaluation and treatment as described in the *NMFS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standard for Rehabilitation Facilities* (Attachment D).

c. The Participant shall not exceed their maximum holding capacity for cetaceans and pinnipeds based on the minimum standard space requirements, the number of animals housed in each holding area, and the availability of qualified personnel as described in the *NMFS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standard for Rehabilitation Facilities* (Attachment D) unless a written waiver is first received from the NMFS Regional

Administrator. The NMFS Regional Stranding Coordinator may offer assistance for relocating animals to another rehabilitation facility and in supporting decisions to euthanize when necessary. Other considerations for determining maximum holding capacity include:

(1) On-site veterinary care, volunteer support, and experienced staff;
(2) Adequate food and medical supplies and medical test capabilities;
(3) Isolation for marine mammals;
(4) Adequate water quality;
(5) Limited public access; and
(6) Ability to maintain current, accurate and thorough records

d. The Participant shall follow contingency plans approved by NMFS for the care of marine mammals in rehabilitation during planned events (e.g., construction) or unexpected events such as mass strandings, UMEs, natural disasters (e.g., hurricanes, harmful algal blooms, El Niño), and/or hazardous waste spills.

e. The Participant shall isolate rehabilitating marine mammals from other wild or domestic animals and from any animal in permanent captivity.

f. The Participant shall prohibit the public display and training for performance of stranded rehabilitating marine mammals as required by 50 CFR 216.27(c)(5). This includes any aspect of a program involving interaction with the public.

g. The Participant shall follow any additional requirements for rehabilitation (e.g., isolation) and release prescribed by NMFS in consultation with the Working Group for Marine Mammal Unusual Mortality Events during a marine mammal UME, as recommended in the *National Contingency Plan for Response to Unusual Marine Mammal Mortality Events;* D.W. Wilkinson, NOAA Technical Memorandum NMFS-OPR-9, September 1996.

h. The Participant must temporarily refuse admittance of new cases of stranded marine mammals due to the severity of a disease outbreak when instructed by the NMFS Regional Stranding Coordinator, in consultation with the UME Working Group or other experts, if diseases of concern have been reported (e.g. diseases associated with a UME, or any emerging or zoonotic diseases).

i. The Participant shall not transfer a marine mammal being rehabilitated under this Agreement to another facility without prior approval form the NMFS Regional Stranding Coordinator.

[Reserve:

j. If a marine mammal dies while in rehabilitation, Article III applies.]

2. Release

a. Release Recommendation. The Participant shall make a final written recommendation for each animal in rehabilitation as early as possible, and no more than six months after its date of rescue, for release or non-release determination to the NMFS Regional Administrator according to any applicable NMFS release guidelines and regulations including 50 CFR 216.27 (release, non-releasable, and disposition under special exception permits for rehabilitated marine mammals). This final recommendation shall include a release recommendation signed by the Participant's attending veterinarian, attesting that the marine mammal is medically and behaviorally suitable for release in accordance with the NMFS Standards for Release, and a concurrence signature from the Participant's Authorized Representative or Signatory of the Stranding Agreement (see Attachment D, *NMFS /FWS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release*).

b. Release Plan. If the Participant recommends release, a release plan must also be included with the final recommendation letter. This information must be submitted to and approved by the NMFS Regional Administrator at least 15 days prior to the release, unless advanced notice is waived by the NMFS Regional Administrator, as required by 50 CFR 216.27(a).

3. Data Collection and Reporting

a. Diseases of Concern Reporting. The Participant shall notify, [immediately or] within 24 hours, the NMFS Regional Stranding Coordinator of learning of any diseases of concern (e.g., emerging, reportable, and/or zoonotic diseases) that are detected and/or confirmed that could be a potential hazard for public health or animal health (NMFS will provide guidance on Reportable Diseases);

b. Disposition Reports. Upon release or other disposition of any marine mammal under this Article, the Participant shall complete the NOAA Form 89878, OMB # 0648-0178 (the Marine Mammal Rehabilitation Disposition Report Form). Completed forms shall be sent to the NMFS Regional Stranding Coordinator via the NMFS National Marine Mammal Stranding Database or in writing (see Attachment B), no later than 30 days after final disposition of the marine mammal. If requested by the NMFS Regional Stranding Coordinator and if feasible, the Participant shall provide preliminary data (verbal or written) from the Marine Mammal Rehabilitation Disposition Report within 24 hours.

c. [*Reserved* {Annual Summary Reports. The Participant shall submit an annual report (due January 31 each year) summarizing the Participant's rehabilitation activities for the past calendar year. NMFS will not reproduce, modify, distribute, or publish the data without consent of the Participant unless required to release

the data under Federal law or order (such as the Freedom of Information Act).

The reports shall include the following for each animal in rehabilitation:

i. Species and field number
ii. If the animal was released:
    (a) Date, location of release (latitude and longitude).
    (b) Type and specifics of post-release monitoring (roto-tag, satellite, etc.) and any roto-tag or freeze brand numbers used.
    (c) Photos if possible.
    (d) Duration of post-release monitoring.
    (e) Status of post-release monitoring.
    (f)) Indications from monitoring relative to success of the rehabilitation effort.
    (g) Disposition of tracking data if applicable.
iii. If the animal was transferred to permanent care:
    (a) Date of physical transport (if applicable)
    (b) Location of permanent care
iv. If the animal was euthanized, provide the date of euthanasia.
v. If the animal died, provide the date of death.

[Reserved for those without Article III authorization:]

4. Parts Disposition. Diagnostic parts, tissue samples, fluid specimens, parts or cells may be transferred to labs within the United States for diagnostic use without any additional authorizations. For non diagnostic parts or samples:

a. Retention: Marine mammal parts may be retained by the Participant for education and/or research purposes, provided they are properly indicated in the "Specimen Disposition" field of NOAA Form 89-864, OMB #0648-0178 (the Marine Mammal Rehabilitation Disposition Report Form). Parts and/or containers must be marked with the field identification number assigned by the Participant or by NMFS (i.e., NMFS registration number). Authorization to take parts from ESA listed species in the [*insert* Region] is currently provided under MMPA/ESA Permit No. 932-1489-09, as amended, issued to the NMFS Marine Mammal Health and Stranding Response Program Coordinator, and requires authorization and direction from the NMFS Regional Stranding Coordinator in the event of a stranding involving a threatened or endangered marine mammal, prior to any action by the Participant.

b. Transfer: Report to the NMFS Regional Administrator (See Attachment B) within 30 days of the stranding event, the transfer of any parts salvaged from the stranded marine mammal collected under this Agreement as required by 50 CFR 216.22 [or 50 CFR 216.37.] The Participant must provide the institution name where specimen materials have been deposited and ensure that the retained or transferred parts are marked with the field identification number or assigned NMFS Registration number in the "Specimen Disposition" field on the NOAA

Form 89864, OMB #0648-0178 (the Marine Mammal Rehabilitation Disposition Report Form) and ensure that retained or transferred parts are marked with the field identification number or the NMFS Registration Number. If parts are being transferred, the Participant must ensure the receiving institution is authorized by the NMFS Regional Administrator to receive marine mammal parts.

ARTICLE VI
Participant's Authorized Personnel [and Designees]

Reserved
OR

A. Personnel and Volunteers

Takings of marine mammals authorized in this Agreement may only be directed by the Participant's personnel and trained volunteers identified by the Participant in writing to the NMFS Regional Administrator. The Participant may use other (i.e., not previously identified to NMFS) volunteers to carry out activities in this Agreement only if they are under the close direction of previously identified trained personnel or volunteers. The Participant may not delegate authority to take marine mammals to another person except as provided in this article.

In the event of changes in key personnel, the prospective Participant shall notify the NMFS Regional Administrator in writing (see Attachment B) [within 30 days] and provide a description of the experience of new key personnel for review and approval by NMFS. New key personnel must be meet the qualification terms identified in the *NMFS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release - Evaluation Criteria for a Marine Mammal Stranding Agreement* (Attachment D).

B. Untrained Citizens

If the Participant requests the assistance of untrained citizens (e.g., during a mass stranding), the Participant is responsible for the actions of those citizens during the response; must take precautions against injury or disease to those volunteer citizens; and must ensure that the citizens' actions do not cause unnecessary harassment of marine mammals.

Reserve all or C.1. and C.2.:

C. Designee Organizations.

1. Authorization for Designee Organization(s). The Participant may designate an organization, or institution, to act on behalf of the Participant as a designee in accordance with this Agreement. For the purposes of this Agreement, the term designee does not refer to individual personnel/volunteers of the Participant's organization, or to individual personnel/volunteers of the Designee organization or institution. Any designation requires prior written approval from the NMFS Regional Administrator (Appendix A). Any organization or institution so designated shall be deemed an agent of the Participant and NMFS, and is subject to ALL applicable provisions of this Agreement as well as applicable laws, regulations, and guidelines. The Participant must provide oversight of their designee organization(s). Any breach of the provisions of this Agreement by a designee of Participant shall be deemed a breach by the Participant.

2. Purpose of Designee Organization(s). The purpose of a designee organization(s) is to assist the Participant with improved sub-region coordination, response, and/or rehabilitation capability within the Participant's geographic area of responsibility. The ability to train and oversee Designees helps create new organizations and build the Stranding Network capacity. NMFS will evaluate designee organizations based on the Participant's justification for geographic need, enhancement of response capabilities, and level of experience provided by the designee organization.

3 Terms and Conditions for Adding Designee(s): To request the addition of a Designee Organization to the Participant's Stranding Agreement, the Participant must submit required written information (see below and Attachment D, *NMFS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release - Evaluation Criteria for a Marine Mammal Stranding Agreement).* This information must be received at least 30 days prior to any prospective designation, to the NMFS Regional Administrator (see Attachment B) for review and approval. NMFS will respond in writing to the Participant's request within 30 days of receipt of the request with an approval, rejection, or request for more information.

a. Complete name of the designee person, organization, or institution.
b. Resumes or CVs of all key personnel for Designees including evidence of relevant training;
c. Justification Statement for designation;
d. Geographic coverage area for response;
e. For rehabilitation facilities, a facility operation plan including personnel, veterinary care, equipment list, and other requirement stated under any applicable NMFS laws, regulations, policies, and guidelines. The Designee must also have all applicable Federal, state, and local permits for rehabilitation facilities;
f. Oversight plan including how Participant will monitor the activities of the designee under the Agreement; and
g. A copy of written Agreement between the Participant and the Designee that must state that the designee has agreed to abide by all the terms and conditions in the Participant's Stranding Agreement.

4. A Designee organization may not be authorized for activities different than or exceeding those contained in the Stranding Agreement of the Participant.

ARTICLE VII

Rights of States and Local Governments

Nothing in this Agreement shall be construed to affect the rights or responsibilities of other Federal, state, or local government officials or employees acting in the course of their official duties with respect to taking of marine mammals in a humane manner (including euthanasia) for protection or welfare of the marine mammal, protection of public health and welfare or non-lethal removal of nuisance animals (MMPA section 109(h)).

ARTICLE VIII
Effective Dates, Renewal and Application Procedures

A. Effective Date

The terms of this Agreement shall become effective upon the signature by both [Participant acronym] and the NMFS [*insert* Region] Regional Administrator.

B. Period of Agreement

1. **Duration:** Unless terminated as provided in this Agreement, this Agreement shall expire at the end of the following applicable period *[insert* expiration date]:

   1 year for new Stranding Network Participants
   1 year for a Stranding Network Participant on probation
   3 years for a live animal responder and rehabilitator (Articles IV and V)
   6 years for a dead animal only responder (Article III only)

2. **Stranding Agreement Renewals**: No later than 90 days prior to the expiration date of this Agreement, NMFS will provide the Participant with a written notice of expiration, and prescribe information needed from the Participant for renewal (see *NMFS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release - Evaluation Criteria for a Marine Mammal Stranding Agreement*, Attachment D). No later than 60 days prior to the expiration date, the Participant shall indicate in writing to NMFS (see Contacts, Attachment B.) that a renewal of this Agreement is requested and shall provide the prescribed information. Following NMFS review of the submitted information to determine if Participant meets applicable requirements, the Agreement may be renewed if agreed to in writing by both parties.

   If no written renewal request is received from the Participant, this Agreement becomes null and void upon the above expiration date.

3. **Provisional Stranding Agreements Renewals**: For new participants, the NMFS Regional Administrator will enter into this Agreement for a provisional period of one year from the effective date. The performance of the Participant will be reviewed to determine if the services provided by the Participant under this agreement have been satisfactory to NMFS. If NMFS determines that the new Participant has satisfied the terms and conditions of this stranding agreement, this Agreement may be extended for a multi-year period. New participants operating without any deficiencies (see Article IX. D), are considered to be in "good standing" under this Agreement.

4. **Denial of Stranding Agreement Renewal**: The decision to renew or deny a Stranding Agreement is solely at the discretion of the NMFS Regional Administrator and is not compelled by the Participant's adherence to the Stranding Agreement criteria. If the

NMFS Regional Administrator denies a renewal request, the denial will be issued in writing by certified mail from the NMFS Regional Administrator to the Participant within 30 days of the Participant's submission of a completed application, and will be based upon the Regional Administrator's judgment of:

a. Past performance of the Participant;
b. Existing capabilities of the Participant; and
c. Geographic and programmatic needs of NMFS' stranding program.

A Stranding Agreement for which renewal is denied by the NMFS Regional Administrator becomes null and void upon the expiration date listed above.

ARTICLE IX
Review, Modification and Termination

A.. Review

The NMFS [*insert* Region] ARA for Protected Resources shall review this Agreement [*reserve* annually or from time to time] for performance adequacy and effectiveness.

B. Modification

The Participant or the [*insert* Region] Regional Administrator may request a modification to the Stranding Agreement, including, but not limited to, procedural or administrative changes, such as a change in contact information, and a request for expansion or reduction of activities authorized by this Agreement. A request for authority for additional activities may require submission of information identified in Attachment D, *NMFS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release - Evaluation Criteria for a Marine Mammal Stranding Agreement*. Modifications and reductions in authority, as well as notice of issuance or denial of a request for increased authorizations, will be given in writing within 30 days of receipt of a completed request. The Participant and the NMFS Regional Administrator may determine that a new Stranding Agreement is warranted.

C. Suspension or Termination request by Participant

The Participant may request suspension of all or part of this Stranding Agreement for a stated period of time, or may terminate this Agreement, upon 30 days written notice to the NMFS Regional Administrator. Suspension of the authorization of activities at the request of the Participant may be given without prejudice to the reinstatement of authorization or renewal of a Stranding Agreement.

D. Non-Compliance with Stranding Agreement or Violations of Law by Participant

Except in cases of willfulness, or those in which public health, interest, or safety requires immediate suspension, or termination of this Agreement, NMFS shall provide the Participant with notice and an opportunity to correct any deficiencies within a time period specified by NMFS, in writing, if the Participant fails to satisfy the terms and condition of this Agreement or violates any laws, regulations, or guidelines applicable to this Agreement, or Federal, state or municipal laws related to stranding network operations. The NMFS Region may take the following actions based on the circumstances:

1. **Probation.** The Participant may be put on probation for up to three years if deficiencies are not corrected. The NMFS Regional Stranding Coordinator and the Participant will develop a timetable with reasonable and measurable milestones that must be achieved to correct deficiencies during the probation period. Probation requires annual reviews of the Participant's activities for up to three years.

A participant on probation may not be in "good standing" with the Stranding Network.

2. **Suspension.** The NMFS Regional Administrator may suspend the Participant's authority, or any portion of their authority, as appropriate (e.g., suspend rehabilitation authority, but not live or dead animal response), with 30 days written notice, for up to 1 year or until NMFS is satisfied that all deficiencies and violations have been adequately addressed. A notice of suspension listing deficiencies and a timetable with reasonable and measurable milestones required to correct those deficiencies will be issued in writing, delivered in person or by certified mail, from the NMFS Regional Administrator if, in the judgment of the Regional Administrator, the Participant has:

   a. Submitted false information or statements in applications or reports;
   b. Not satisfied the terms and conditions of the Stranding Agreement;
   c. Failed to correct deficiencies in a timely manner; or
   d. Violated applicable Federal, state, or municipal laws, regulations, guidelines, or other requirements.

   A participant on suspension is <u>not</u> in "good standing" with the Stranding Network.

3. **Immediate suspension.** The NMFS Regional Administrator may require immediate suspension of authorization under a Stranding Agreement, or any part of the Agreement, without prior notice if, in the judgment of the Regional Administrator, suspension is needed to protect marine resources, in cases of willfulness, or as otherwise required to protect public health, welfare, interest, or safety, (which includes interest in the welfare of marine mammals). During the suspension period, the NMFS Regional Stranding Coordinator may ask other Stranding Network participants to respond in the Participant's area of geographic coverage. If the Participant's Stranding Agreement is suspended while animals are in rehabilitation, NMFS reserves the right to either confiscate the animals or to arrange for another participant to take over rehabilitation or take custody of the animals. A written notice of immediate suspension will be issued in person or by certified mail.

   A participant on immediate suspension is <u>no</u>t in "good standing" with the Stranding Network.

4. **Termination**. The NMFS Regional Administrator may terminate this Agreement, or any part thereof, upon at least 30 days written notice to the Participant, delivered in person or by certified mail. The Agreement may be terminated for any reason, including the Participant's:

   a. Submission of false information or statements in applications or reports;
   b. Failure to satisfy the terms and conditions of the Stranding Agreement;
   c. Failure to correct deficiencies in a timely manner; or

d. Violation of applicable Federal, state, or municipal laws, regulations, guidelines, or other requirements.

The NMFS Regional Stranding Coordinator may ask another Stranding Network participant to respond in the Participant's area of geographic coverage. If the Participant's Stranding Agreement is terminated while animals are in rehabilitation, NMFS reserves the right to either confiscate the animals or to arrange for another participant to take over rehabilitation of or to take custody of the animals.

Termination of the Agreement for any reason shall automatically terminate any designations by the Participant to any designee organizations under this Agreement.

[*Reserve for SAs with Designees*]:

5. **Violations by Designees.** Violations by the Participant's Designee organization are considered to be violations by the Participant. NMFS will address violations by Designees directly with the Participant according to this Article. In addition, NMFS may use the remedy of terminating the designation.

Pursuant to the terms and conditions described above in this Stranding Agreement between [Region] and [Participant], the Participant is authorized *(insert applicable authorizations):*

- **Under Article III to response to strandings of dead marine mammals *{reserve for taxa}*;**
- **Under Article IV to provide first response to live stranded marine mammals;**
- **Under Article V to rehabilitate and release live stranded marine mammals**

THIS STRANDING AGREEMENT IS ENTERED INTO AND MADE EFFECTIVE THIS

Date_____ **Date** _____

APPROVED:

NMFS [Region] Region **[Stranding Network Organization]**

Signature of Regional Administrator **Signature of Authorized Representative**

_____ _____

THIS STRANDING AGREEMENT REMAINS IN EFFECT UNTIL:

Expiration Date: _____

Appendix A.

Designees:

Statement of Agreement for designation of authority and responsibilities to any organization or institution to act as agents under this Agreement.

AGREEMENT

I have read the conditions as stated above for participating in the Stranding Network as an agent of the_____(Stranding Network Organization) under its Agreement with the National Marine Fisheries Service Region and agree to abide by all applicable provisions of the Agreement between the National Marine Fisheries Service Region and _____ (Stranding Network Organization).

NMFS Region	Authorized Representative of Stranding Organization	Authorized Representative of Designee Organization

Signatures

Title

Affiliation

Date **Expiration Date**

ATTACHMENT LIST

Attachment A. List of Terms and Definitions under 50 CFR 216.3, Glossary of Terms, etc.

Attachment B. Regional contact information, 24 hour numbers, etc.

Attachment C: Euthanasia guidance

Attachment D: NOAA National Marine Fisheries Service *Best Practices* for Marine Mammal Stranding Response, Rehabilitation, and Release Documents:

- **Evaluation Criteria for a Marine Mammal Stranding Agreement (New Applicants and Renewals of Existing Participants)**
- **Standards for Release**
- **Standards for Rehabilitation Facilities**
- **Level A Forms (Marine Mammal Stranding Report and Marine Mammal Rehabilitation Disposition Report)**

Attachment E: NMFS Southeast Region Disposition of Live Stranded Marine Mammal guidance.

POLICIES AND BEST PRACTICES

MARINE MAMMAL STRANDING RESPONSE, REHABILITATION, AND RELEASE

Evaluation Criteria for a Marine Mammal Stranding Agreements
(New Applicants and Renewals)

Prepared by
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NOAA National Marine Fisheries Service
Marine Mammal Health and Stranding Response Program

February 2009

Evaluation Criteria for a Marine Mammal Stranding Agreement (New Applicants and Renewals)

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Evaluation Criteria for a Marine Mammal Stranding Agreement (New Applicants and Renewals)

Shaded text denotes reserved text at the discretion of the NMFS Regional Administrator.

(1) To renew an existing Stranding Agreement, the applicant must demonstrate past compliance with the terms and responsibilities of their Stranding Agreement, including reporting requirements and deadlines.

(2) For the purpose of network development and expansion of stranding response capabilities in geographically remote or low coverage areas [e.g., Alaska, Washington, Oregon, Hawaii, and American Territories (i.e., Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Marina Islands)], referenced evaluation criteria may be waived based on the discretion of the NMFS Regional Administrator.

(3) If long-term care is not feasible, a plan for disposition of live marine mammals at alternate care facilities must be submitted.

1. Purpose and Application

These minimum evaluation criteria have been developed to assist the National Marine Fisheries Service [Region] Region (NMFS) in its evaluation of Stranding Agreement renewal requests and new Stranding Agreements proposals. Prior to issuing new Stranding Agreements, the NMFS [Region] Regional Administrator must determine there is a programmatic and/or geographic need for a Stranding Network Participant in the proposed area of response. Geographic or programmatic needs are based on, but not limited to, the following factors: the historic number of stranded marine mammals in an area, the amount of personnel and resources of stranding network participants with existing agreements in the proposed response area, the geographic extent of the proposed response area, and the proximity of the existing and prospective stranding network participants to the proposed response area.

The decision to enter into an Agreement under which an organization may take species under the Marine Mammal Protection Act for the purpose of stranding response is solely at the discretion of the NMFS [Region] Regional Administrator. NMFS [Region] Region is not compelled to enter into or to decline to enter into a Stranding Agreement based on an interested party's adherence with these criteria. NMFS weighs the geographical need, programmatic need, level of expertise, stranding related activities, cooperation, and criteria listed below when making its determination in determining whether to issue a new Stranding Agreement.

2. General Evaluation Criteria for Articles III, IV, and V Authorization [(1)]

2.1 General Information

The existing or prospective Participant should provide the following information to NMFS as part of their request to obtain or renew an existing Stranding Agreement with NMFS or upon any significant changes to the information:

1. Participant Contact Information. This should include:
   a. Mailing address, phone number, e-mail, and facsimile for all official correspondence.
   b. Physical address and location of the facility or facilities (if applicable).
   c. Name, title, and contact information for an authorized representative with signatory authority for the organization - Authorized Representative (e.g., Executive Director, Director, President, CEO, etc.).
   d. [24-hour] contact numbers if applicable, including office, home, and/or cell phone numbers of primary responders, key personnel/volunteers, and veterinarians.
2. Description of Organizational Goals, Capability, and Experience. This should include:
   a. Brief summary of the existing or proposed organization's mission, goals, and objectives and how these complement objectives for the [Region] Regional Stranding Network.
   b. Brief summary on history and type of organization (e.g., university, governmental, non-profit, aquarium, etc.).
   c. Description of any past or current collaboration with NMFS, other Stranding Network participants, researchers, or the public.
   d. Summary of relevant organizational experience with response to live/dead stranding events and /or rehabilitating marine mammals within the past three years.
   e. An overview of general capabilities to conduct stranding response.
3. Proposed Scope and Area of Geographic Response. This should include:
   a. Brief summary of the existing or proposed scope of the stranding program (e.g., all species of cetaceans, pinnipeds), and whether the request is for response to dead animals only, live and dead animals, and/or rehabilitation.
   b. Justification and description of the existing or proposed geographic area of coverage and why the area of response is appropriate for the organization (e.g., the amount of personnel/volunteers and resources available, relative to shoreline covered, historic

number of stranding events, etc.). Latitude and longitude of proposed geographic area and maps are especially helpful.

4. Description of Organizational Structure. This should include:
   a. An overview of staffing, personnel, volunteers, veterinarians, the primary representative, and primary responders, including organizational charts, titles, and position descriptions as appropriate.
   b. Brief summary of relevant training, experience, and qualifications for key stranding response personnel, including primary responders, veterinarians and volunteers as appropriate.
   c. Description of how personnel/volunteers will collect, report, and maintain Level A stranding data and conduct basic (Level B) tissue sample collection. This should also address requirements for accurate and timely reporting.
   d. Description of how volunteers are trained and monitored to ensure quality data collection.
   e. Description of how the organization will keep NMFS informed about any changes in key personnel, geographic area of coverage, or capabilities.
5. Equipment and Resources. This should include:
   a. Description of resources, supplies and equipment currently available to conduct stranding response (live and/or dead). This could include, but may not be limited to, information on types and availability of necropsy equipment, freezers, trucks, tagging equipment (e.g., roto-tags), stretchers, vessels, triage equipment, and transport equipment, and temporary and/or permanent pools.
6. Rapid Response and Investigation Procedures. This should include:
   a. Procedures for stranding response for dead/live stranded marine mammals.
   b. Human health and safety precautions used.
   c. How calls are handled, availability (e.g., 24 hour pager), and which personnel will respond.
   d. How necropsies will be coordinated and conducted.
   e. Capabilities and general rescue plan, and plans for animal care (e.g., on-site veterinary care) for live animal response including triage, transport, and euthanasia.
   f. Protocols for decision-making when responding to a live animal.
   g. Description of how the organization will coordinate with other Stranding Network members and NMFS.

7. Any other relevant documentation (permits, authorizations, agreements, etc.) for review prior to entering into any Stranding Agreement and at any subsequent time as requested by the [Region] Regional Administrator, or when additional documentation is obtained that may become relevant to performance under the Agreement.
8. Documentation of experience, ability, and knowledge (e.g., CV, resume, certificates, letters of recommendation, etc.) of key personnel (e.g., primary representative, primary responder). Experience can be obtained through paid employment, internships, volunteering, course work, and/or NMFS approved training.
9. For prospective Participants, demonstrate experience working under the direct supervision of an existing Stranding Network Participant in good standing or NMFS for at least three years or equivalent case load.[(2)] The prospective Participant may apprentice as a "designee" organization under a Stranding Agreement holder to obtain this experience.
10. Letter(s) of support from peers such as other stranding network organizations (Stranding Agreement/Designee organizations), universities/researchers, government agencies, non-governmental organizations, professional organizations, etc. Such letters of support could also be provided from the current Stranding Agreement holder under which the Participant received experience and include assurances that the prospective Participant can support programmatic and geographic needs in the area (new Stranding Agreement proposals only).

2.2 General Qualifications for Articles III, IV, and V

NMFS will evaluate existing and prospective participants based on their demonstrated track record and their capabilities in the following areas as described in their request:

1. Ability to provide description of [24-hour] on-call coverage for the proposed geographic area of response (e.g., established "hot-line" number, message phone, staffed pager, etc.).
2. Demonstrated ability to comply with standard instructions and collect Level A data from stranded marine mammals according to established protocols.
3. Ability to conduct full post-mortem exams, including obtaining histopathology samples and other biological samples (if feasible and requested by NMFS).
4. Willingness and ability to communicate in a professional manner, and demonstrated ongoing cooperation with NMFS, other network members, the general public, local and state agencies.
5. Willingness and ability to cooperate with authorized marine mammal researchers.
6. Ability to address health and safety when responding to dead or live stranded marine mammals, or marine mammals in rehabilitation (e.g., a description of the organization's

operational safety plan or protocols).

7. Demonstrated experience specific to the marine mammal species that are most likely encountered in the proposed area of geographic response.

3. Evaluation Criteria for Response to Dead Stranded Marine Mammals - First Response (Article III Authorization) [(1)]

In addition to the general criteria, Participants proposing to respond to dead stranded marine mammals should provide information that shows the Participant's plan for implementing Article III of the Stranding Agreement, and present evidence that the Participant has the skills, resources, and organizational capabilities to be successful.

3.1 Information for Article III Authorization

Key Personnel. The prospective Participant should have and maintain one Authorized Representative and at least two **Primary Responders**, at least one of whom will be on-site or supervising when dead animals are being examined or handled and is responsible for the day to day operations (i.e., paid and unpaid staff).[(2)] The **Authorized Representative** has signatory authority for the stranding organization and may be the signatory of the stranding agreement (e.g., Executive Director, President, CEO, etc.).

1. Additional personnel may be necessary, commensurate with the proposed geographic area of response and frequency of stranding events.
2. Equipment List. The prospective Participant should demonstrate they have and maintain equipment appropriate to dead animal stranding response – i.e., for dead animal response the equipment list should at least include items necessary for Level A data collection.

3.2 Qualifications for Article III Authorization

1. Key personnel should have experience or comparable training to collect Level A data and if possible to collect Level B data (i.e., complete necropsy). Requests should address key personnel qualifications as follows:
    a. Experience conducting or observing complete necropsies [on a minimum of six marine mammals with at least three of those necropsies on Code 2 animals.][(2)]
    b. Ability to identify species of marine mammals in the field (Code 2).
    c. Ability to accurately identify code condition of marine mammals in the field (Code 1-5).
    d. Ability to obtain accurate Level A stranding data and if possible, to conduct basic tissue sample (Level B) collection.
    e. Knowledge and experience complying with Level A data reporting requirements.

f. Knowledge and experience complying with sampling protocols, sample processing, and shipping procedures.
g. Knowledge of marine mammal anatomy and physiology.
h. Knowledge of human health and safety precautions including potential zoonotic marine mammal disease.
i. Knowledge of state and local disposal policies and rules.

4. Evaluation Criteria for First Response, Triage, and Transport of Live Stranded Marine Mammals (Article IV Authorization) (1)

In addition to criteria in sections I and II, prospective Participants proposing to conduct response to live stranded marine mammals should provide information that shows the Participant's plan for implementing Article IV of the Stranding Agreement, and present evidence that the Participant has the skills, resources, and organizational capabilities to be successful.

4.1 Information for Article IV Authorization

Key Personnel. The prospective Participant should have and maintain one Authorized Representative and at least two **Primary Responders** all with experience in marine mammal stranding response, triage, transport, and/or euthanasia, at least one of whom will be on-site or supervising when animals are being examined or handled and is responsible for the day to day operations (i.e., paid and unpaid staff)**.** The **Authorized Representative** has signatory authority for the stranding organization and may be the signatory of the stranding agreement (e.g., Executive Director, President, CEO, etc.).

1. Additional personnel may be necessary, commensurate with the proposed geographic area of response.

2. Veterinary Support. The prospective Participant should identify an attending veterinarian and identify at least one backup veterinarian or have a contingency plan for when the attending veterinarian is not available. Requests should provide documentation of the veterinarian's experience (e.g., CV, certificates, licenses, etc.).

4.2 Qualifications for Article IV Authorization

Requests should address key personnel and veterinarian qualifications as follows:

1. Key personnel should have experience or comparable training in all aspects of live animal response:
   a. Experience responding to a minimum of [five] live marine mammal stranding events (note: a mass stranding is considered to be one event).(2)
   b. Experience providing triage and/or transport for a minimum of [three] live stranded marine mammals during separate stranding events.(2)
   c. Knowledge and experience monitoring marine mammal vital signs.

d. Ability to assess the condition of stranded marine mammals and make recommendations concerning immediate release, rehabilitation, or euthanasia.
e. Ability to accurately identify species of marine mammals in field conditions.
f. Experience responding to at least one mass stranding event (preferred but not required).[(2)]
g. Ability to [draw blood and] make basic measurements (e.g., length).
h. Ability to tag a marine mammal (e.g., for situations that involve immediate release following assessment).
i. Ability to communicate professionally with other members of the Stranding Network and take direction from NMFS and other on-site coordinators.

2. Attending veterinarians should meet the following criteria:
   a. Be on-call 24-hours.
   b. Knowledge and demonstrated experience in monitoring marine mammal vital signs.
   c. Ability to assess the condition of stranded marine mammals and make recommendations concerning immediate release, rehabilitation, or euthanasia.
   d. Ability to draw blood from a marine mammal.
   e. Have the appropriate registrations and licenses (e.g., registered with the Drug Enforcement Administration for handling controlled substances) to obtain the necessary medications and euthanasia drugs.
   f. Ability to perform humane euthanasia on marine mammals.
   g. Demonstrated familiarity with marine mammal triage and transport.
   h. Access to a list of veterinarians with marine mammal expertise to consult with if needed.
   i. Compliance with any applicable state requirements for veterinary practice on stranded marine mammals.
3. The prospective Participant should demonstrate knowledge of national, state, and local/municipal laws relating to live animal response.
4. The prospective Participant should have provisions for, and willingness to conduct, humane euthanasia as necessary and appropriate.
5. Equipment List. The prospective Participant should have and maintain equipment appropriate to live stranding response, i.e., those items necessary for triage, transport, and/or euthanasia. A complete list of equipment available shall be provided by the prospective Participant.

5. Evaluation Criteria for Rehabilitation and Release of Live Stranded Marine Mammals (Article V Authorization)[1,3]

In addition to the criteria in sections II, III, and IV (if applicable), Participants requesting authorization to conduct rehabilitation of marine mammals should provide information that shows the Participant's plan for implementing Article V of the Stranding Agreement, and present evidence that the Participant has the skills, resources, and organizational capabilities to be successful. The NMFS document, *"Policies and Best Practices: Standards for Rehabilitation Facilities,"* provides additional detailed guidance for preparing Stranding Agreement requests. This document can be found at http://www.nmfs.noaa.gov/pr/health/eis.htm. Facility operations should be consistent with applicable NMFS policies, guidelines, directives, regulations, and other applicable State and Federal policies, guidelines, directives, regulations, and laws.

5.1 Information for Article V Authorization

The prospective Participant should provide information on the following:

1. Facility Capabilities and Procedures. This should include, but not be limited to:
    a. Information on facilities.
        i. Pool type (or housing/pool for pinnipeds) design, description, and dimensions.
        ii. Type of available shelter and/or shading.
        iii. Maximum holding capacity. Description of facility's maximum holding capacity based on minimum standard space requirements and number of animals housed in each holding area and the availability of qualified personnel as provided in the NMFS document, "*Policies and Best Practices: Standards for Rehabilitation Facilities".*
        iv. Water Quality. Description of water, source, quality, and how it is maintained, including how water is tested and frequency of tests.
        v. How the facility/rehabilitation area is secured from public access.
        vi. Provisions for isolating marine mammals.
        vii. How other wild and/or domestic animals will be kept isolated from marine mammals.
        viii. How animals will be quarantined if necessary.

b. Information on procedures for:

i. Food handling and sanitation.

ii. Human health and safety throughout the rehabilitation facility.

iii. How medical, husbandry, and other relevant records will be maintained for each animal. Samples of record forms are helpful.

iv. Efforts to reduce disease transmission.

v. Humane animal care, routine medical procedures, and euthanasia.

c. Key Personnel. The prospective Participant should have and maintain one **Authorized Representative** and two primary animal care specialists, all with experience in marine mammal care and rehabilitation. One of these personnel should fulfill the role of the **Animal Care Supervisor** whom is responsible for overseeing prescribed treatments, maintaining hospital equipment, and controlling drug supplies. The person should be adequately trained to deal with emergencies until the veterinarian arrives, be able to direct the restraint of the animals, be responsible for administration of post-surgical care, and be skilled in maintaining appropriate medical records. It is important that the animal care supervisor should communicate frequently and directly with the attending veterinarian to ensure that there is a timely transfer of accurate information about medical issues. Ideally, this individual should be a licensed veterinary technician or an animal health technician who reports to, or is responsible to, the attending veterinarian. Additional personnel may be necessary, commensurate with the maximum holding capacity. Information regarding key personnel should also include:

i. Overview of staffing plan and capabilities for the rehabilitation facility (e.g., veterinarian technicians, food preparation, record keeping, volunteer/shift coordination, equipment, pool maintenance, etc.).

ii. Description of on-site experienced personnel who are caring for the animals, including resumes or CVs of all key personnel and documentation of relevant training.

iii. Description of how new personnel and volunteers are trained and monitored.

iv. Veterinary Support. The prospective Participant should identify an attending veterinarian and identify at least one backup veterinarian for when the attending veterinarian is not available. Requests should provide documentation of the veterinarian's background, experience, and licensing.

2. Contingency Plans. A copy of contingency plans for protecting or relocating marine mammals in rehabilitation in case of events such as hurricanes or other natural disasters, unusual mortality events, hazardous waste spills, fire, or planned events such as construction.
3. Copies of all applicable Federal, state, and local permits for rehabilitation facilities.
4. General plans for release and post-release monitoring of marine mammals in rehabilitation, including:
    i. How animals will be assessed for release determinations and who makes the assessment.
    ii. How the prospective Participant will follow the NMFS Interim Standards for Release of Rehabilitated Marine Mammals (available on the following website: http://www.nmfs.noaa.gov/pr/health/eis.htm).
    iii. How prospective Participant will conduct tagging, release, and post-release monitoring.
5. Resources. Sufficient physical and financial resources to maintain appropriate animal care for the duration of rehabilitation, including costs associated with release (e.g., long term rehabilitation, transport to release site, post release monitoring) or transport to another facility.

5.2 Qualifications for Article V Authorization

Requests should be evaluated based on the following:

1. Key personnel should have experience or comparable training in all aspects of marine mammal rehabilitation. Requests should address key personnel qualifications for each evaluation criteria below:
    a. Experience or education leading to an understanding of the life history, behavior, biology, physiology, and animal husbandry of applicable marine mammals.
    b. Familiarity with NMFS Interim Rehabilitation Standards, NMFS Interim Standards for Release of Rehabilitated Marine Mammals, and applicable regulations.
    c. Experience in a supervisory role rehabilitating a minimum of three separate rehabilitation cases (Note: Multiple animals in rehabilitation from a mass stranding are considered to be one case).
    d. Ability to humanely restrain a marine mammal to conduct basic medical procedures such as: drawing blood from at least two sites, taking fecal, gastric, blowhole/nasal samples, morphometrics, weighing, injections, and tubing.

e. Experience maintaining and operating a facility/pool for marine mammal care, including familiarity with maintaining proper water quality.
f. Ability to supervise and coordinate on-site personnel and volunteers.
g. Ability to conduct necropsies.
h. Experience with record keeping, such as food intake records, daily behavioral records, medical records, and water quality records (e.g., water temperature, salinity, etc.).
i. Knowledge of how to design and conduct a behavior ethogram (preferred but not required).

2. Attending veterinarians should meet the following criteria:
   a. Have an active veterinary license in the United States (means a person who has graduated from a veterinary school accredited by the American Veterinary Medical Association Council on Education, or has a certificate issued by the American Veterinary Graduates Association's Education Commission for Foreign Veterinary Graduates), or has received equivalent formal education as determined by NMFS Administrator (adapted from the Animal Welfare Act Regulations 9 CFR Ch. 1).
   b. Assume responsibility for diagnosis, treatment, and medical clearance for release or transport of marine mammals in rehabilitation (50 CFR 216.27).
   c. Ability to provide a schedule of veterinary care that includes a review of husbandry records, visual and physical examinations of all the marine mammals in rehabilitation, and a periodic visual inspection of the facilities and records.
   d. Be available on a 24-hour basis to answer veterinary-related questions, and be available in case of an emergency.
   e. Ability to perform routine diagnostic and medical procedures on the type of marine mammal most often admitted to the rehabilitation facility (e.g., draw blood, give injections, etc).
   f. Have marine mammal experience or be in regular consultation with a veterinarian who has marine mammal experience and have access to a list of expert veterinarians to contact for assistance.
   g. [*Reserved*. {Have documented one-year clinical experience working with marine mammals, or have a written consulting agreement with an experienced marine mammal veterinarian, which assures availability of consultation when needed.}]
   h. Ability to conduct full necropsy on marine mammals.
   i. Have access to the most recent edition of the CRC "Handbook of Marine Mammal Medicine."

j. Be familiar with and comply with the standards of veterinary care in the NMFS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release - Standards for Rehabilitation Facilities.

k. Have the appropriate registrations and licenses (e.g., registered with the Drug Enforcement Administration for handling controlled substances) to obtain the necessary medications for the animals housed at that rehabilitation facility.

l. Be knowledgeable of species-specific pharmacology.

m. Have provisions for performance of humane euthanasia.

n. Ability to write and submit timely disposition recommendations for marine mammals in rehabilitation.

o. Be knowledgeable of marine mammal zoonotic diseases and appropriate safety precautions.

3. A trained volunteer base sufficient to initiate and maintain adequate and appropriate marine mammal care and husbandry and implementation of veterinary direction.
4. Knowledge of national, state, and local laws relating to live animal rehabilitation.
5. Familiarity with, and a copy of, the most current version of the NMFS Interim Rehabilitation Facility Standards and Interim Standards for Release of Marine Mammals.

6. Evaluation Criteria for Designee Organizations

The purpose of a Designee organization is to assist the Participant with sub-region coordination, response, and/or rehabilitation capability within the Participant's geographic area of responsibility and under the Participant's oversight. If a Participant is proposing oversight of a Designee organization(s), the Participant [must] should provide evidence that the Designee organization has the skills, resources, and organizational capability to respond to dead/live stranded marine mammals [or rehabilitate marine mammals]. In some cases, it may not be possible for each proposed Designee organization to meet all of the evaluation criteria listed below. If this is the case, NMFS needs written assurance and details specifying how the prospective Participant will take responsibility for fulfilling specific qualifications lacking for the Designee organization.

6.1 Information for Designee Organizations for Articles III, IV, and V

1. For each proposed Designee organization, the Participant should provide the same information required in sections II through V.
2. Justification for Designee. The Participant should submit a justification for the geographic need, and enhancement of response capabilities provided by the Designee organization to the Participant.
3. Copy of a written and signed Agreement between the Participant and the Designee that includes a statement that the Designee organization has read and agreed to the terms of the Participants current Stranding Agreement.

6.2 Qualifications for Designee Organizations for Articles III, IV, and V

1. Each proposed Designee organization will be evaluated according to the same required qualifications listed in sections II through V.

FINAL

POLICIES AND BEST PRACTICES

MARINE MAMMAL STRANDING RESPONSE, REHABILITATION, AND RELEASE

STANDARDS FOR REHABILITATION FACILITIES

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Standards for Rehabilitation Facilities

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Introduction

As part of the National Marine Fisheries Service (NMFS) Stranding Agreements, the Agency will require that all rehabilitation facilities meet the Minimum Standards presented in this document. The goal of this document is to set **MINIMUM** facility, husbandry, and veterinary standards for rehabilitating marine mammals in order to meet the prescribed NMFS Best Practices Marine Mammal Stranding Response, Rehabilitation, and Release - Standards for Release. Likewise some of the standards put forth in this document are based on the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS) Animal Welfare Act (AWA) regulations which define minimum standards for permanent captive marine mammals. However, there are some differences between the two documents in that these standards were developed for temporary care and all age groups. **RECOMMENDED** Standards are included in some sections, and consist of facility design and operational suggestions for optimizing the rehabilitation success rate. Meeting or exceeding the recommended standards may be considered a goal to strive towards when upgrading existing, or designing new facilities or protocols.

It is the intent of NMFS to provide a reasonable process for facilities to be upgraded to meet the minimum standards set forth in this document. Substandard facilities may be improved using funds that may be available through the John H. Prescott Rescue Assistance Grant Program (Prescott Grant). Likewise Prescott Grant funds may also be used to improve facilities that meet minimum standards with the goal to achieve or exceed the recommended standards.

Health and safety practices are highly stressed in this document. NMFS expects that all personnel and volunteers to be trained to the HIGHEST LEVEL of responsibility they are assigned. Rehabilitation facilities are encouraged to comply with Occupational Safety and Health Administration regulations.

Purpose

The purpose of rehabilitation is to provide humane care for stranded marine mammals and to optimize the success of releasing the animals back to the wild. Defining a successful release encompasses many factors. As mandated by Title IV Section 402 (a) of the Marine Mammal Protection Act, NMFS has developed guidance and criteria for release based on optimizing the chances for survival and minimizing the risk to wild populations *(NMFS/FWS BEST PRACTICES for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release*). These facility standards have been developed to achieve the goals set forth by the Standards for Release.

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This document is organized by taxa similar to the Standards for Release. While many aspects of rehabilitating cetaceans and pinnipeds that are the same, there are likewise many significant differences. Water quality, pool space and design, and handling debilitated animals are examples of the bigger differences between facility design and equipment required for rehabilitation of these animals. Rehabilitation of cetaceans requires more expensive facilities, as there must be larger, deeper pools available, salt water systems, and more elaborate filtration in closed system situations. While some facilities have adequate equipment and personnel to rehabilitate pinnipeds, they may not meet the standards required for the rehabilitation of cetaceans. Having two sets of guidelines allows NMFS the flexibility of issuing agreements specific to the types of animals that may be rehabilitated at each facility.

1. Standards for Cetacean Rehabilitation Facilities

1.1 Facilities, Housing, and Space

Pools for stranded cetaceans must be appropriate for the basic needs of the animal including keeping the skin moist, to providing buoyancy, and aiding thermoregulation. Debilitated cetaceans often cannot swim and may require assistance when first introduced to a rehabilitation pool. Cetaceans arriving in a debilitated condition may have needs requiring smaller pools than those that are able to swim and dive upon arrival. Choice of pool size may be important and is case specific. Although chances of survival may be improved if animals capable of swimming are given larger space, deeper pools may make it more difficult and stressful to catch an animal for feeding, hydration, and treatment. Likewise with multiple strandings, grouping animals by size, ability to swim, species, and health status may improve overall survival rates. Placing the larger, more robust animals in separate pools or swimming areas away from the smaller, less dominant and/or more debilitated animals may enhance the success of the rehabilitation efforts for the weaker animals. Species of cetaceans known to be social in nature should be housed with other compatible species. Social compatibility should be considered an important part of appropriate housing. Animals should be closely monitored when introduced to a pool and carefully evaluated for social compatibility.

It is up to the attending veterinarian, as defined in Section 1.7, and experienced rehabilitation staff, to decide how to house the animal most appropriately based on their observations and physical examination.

Each animal admitted to a rehabilitation center should be placed in a quarantine holding area and have a full health evaluation performed by the attending veterinarian. Sufficient quarantine time should be allowed for results from tests and cultures to be evaluated before the animal is placed with animals that are apparently disease free. Cetaceans with evidence of infectious disease must be quarantined (See Section 1.4 Quarantine).

During multiple or unusual stranding situations such as hazardous waste spills, catastrophic weather events, toxic algal blooms, or other events leading to unusually high morbidity, rehabilitation center personnel may need to adjust the number of animals that would be normally housed in each pool, bay or ocean pen. The attending veterinarian is responsible for assuring that the number of animals housed in one pool or pen will be appropriate based on the situation. The number of animals housed should be determined not only by the amount of pool space and size of the animals, but also by the number of qualified personnel available on a per animal basis. The recommended number of

personnel to animals less than 250 kg is 3:1 for critical care cetaceans; 2: 1 - 4 once stabilized, and 1:4 when animals are eating regularly and no longer require regular handing. Larger critical care cetaceans will require more personnel per animal.

Unweaned neonate cetaceans shall not be admitted for rehabilitation without prior approval of NMFS. Unweaned cetaceans, once rehabilitated, are frequently not suitable for release or require stringent release criteria to ensure humane treatment and a successful outcome. A rehabilitation facility needs to thoughtfully consider these types of cases when developing overall facility goals and objectives. If the facility aims to rehabilitate neonatal and/or unweaned calves, then they need to discuss and seek concurrence with NMFS options for final disposition since most of these cases will be nonreleasable. These issues need to be researched, outlined and NMFS approved prior to admitting any cases. The plan should include options and criteria for release if appropriate (e.g., release with mother), considerations for permanent care, and euthanasia.

NMFS Regulation, U.S.C. 50 CFR 216.27(c)(5) states that marine mammals undergoing rehabilitation shall not be subject to public display. The definition of public display under U.S.C. 50 CFR "is an activity that provides opportunity for the public to view living marine mammals at a facility holding marine mammals captive." (See Section 1.13 Viewing).

1.1.1 Space Requirements for Pool, Bay, or Ocean Pens

MINIMUM STANDARD

- All pools or pens must be deep enough for animal(s) to float and submerge and shall be available for all rehabilitating cetaceans. The diameter and depth of the pool for critical care animals is at the discretion of the attending veterinarian.
- Pool depth for non-critical animals (animals able to swim unassisted) must equal one-half the body length or 0.9 meters (3 feet), whichever is greater.
- Pools shall have a minimum horizontal dimension (MHD) of 7.3 meters (24 feet) or two times the actual length of the largest species housed in the pool, whichever is greater.
- Animals housed longer than 6 months must be provided with pools at least 1.5 meters (5 feet) deep and must meet the USDA, APHIS AWA MHD standards unless otherwise directed by the attending veterinarian. This should be documented and justified with a signed veterinary statement in the medical records.

RECOMMENDED

- Pools shall have a depth equal to the body length or 1.8 meters (6 feet), whichever is greater.
- Pools shall have a minimum horizontal dimension of 9.0 meters (30 feet) or two times the average adult length of the largest species in the pool, whichever is greater.

1.1.2 Pool or Pen Design

Pools or pens designed to maximize the ease of handling, and to limit the amount of time the cetacean spends out of water for husbandry or veterinary procedures may help to decrease the stress of handling. Pools designed with a deep and a shallow end work well because the cetaceans may stay in the deep end while the pool level is dropped. The animal requiring treatment may be moved to the shallow end and immediately placed back in the deep end when the treatment has been completed. Pools equipped with a false bottom that can be lifted are ideal because the animal can be caught quickly without dropping the level of the pool water and the animal may be immediately returned to the pool once treatments have been completed. False bottoms in bay or ocean pens will facilitate capture, since there is no convenient way to drop the water level in those situations. Pools equipped with lift-bottoms and/or multi-level pools are recommended, however lift bottoms must be carefully designed when being retrofitted to existing pools.

Scoop-net or trampoline methods may also be used for capture, where a net is placed on the pool or pen bottom under the swimming animal and it is lifted by multiple personnel using tag lines. While this method is an inexpensive alternative to a false floor it may not be suitable for multiple or large animals.

New rehabilitation pools should be designed and constructed to minimize introduction of anthropogenic noise from life-support equipment or other sources. This can be accomplished through sloping of walls, insulation with soil or other materials around the sides of the pool and/or through isolation of noise-generating equipment. Existing pools that do not meet these specifications may be allowed, or a retrofit may be requested if the pools are substandard to the point of becoming an animal welfare issue.

MINIMUM STANDARD

- Any shape pool that meets minimum space standard
- Construction materials
    - Open water pens shall optimally be constructed of plastic or other rigid netting.

- If cotton or nylon netting material is used it must be small enough gage to prevent entanglement.

RECOMMENDED

- Pools with long axes that provide relief from constant turning while swimming
- Pools designed to promote good water circulation and to minimize anthropogenic noise.
- Single depth pool with false bottom that can be lifted

  OR
- Pool with a sloping bottom where the water level may be dropped in the shallow end to facilitate treatment

  OR
- Single or multi-depth pool with an adjoining "med pool' with a false bottom that can be lifted

  OR
- Ability to drop a pool in less than 2 hours and refill it to a "swimming level" in less than 30 minutes

1.1.3 Shelter, Shading, and Lighting

Rehabilitation facilities located where there is inclement weather need to provide shelter to rehabilitating animals that may be exposed to extreme heat or cold. Cetaceans held in rehabilitation facilities may not have normal activity levels and thin animals may be unable to thermoregulate properly. These animals may require shade structures to protect them from direct sunlight and extreme heat, or shelter to protect them from extreme cold.

Animals held in indoor facilities should be provided with appropriate light and dark photoperiods which mimic actual seasonal conditions. Light provided in indoor facilities shall be of sufficient intensity to clearly illuminate the pool.

MINIMUM STANDARD

- Shade structures or shelters must be provided to animals when local climatic conditions could compromise the health of the animal noting that some cetaceans undergoing rehabilitation may be unable to swim, dive, or thermoregulate, thus requiring either shelter from the elements or shade.
- Shade structures, where necessary, shall be large enough to provide shade to at least 50% of the MHD surface area determined for the species held in the pool. MHD is defined as 7.3 meters (24 feet) or two times the actual length of the largest species housed in the pool, whichever is greater.

- Lighting should be appropriate for the species.

RECOMMENDED

- Full spectrum lights or a natural source of lighting for animals housed indoors.
- Removable or adjustable shade structures in pens that are easily cleaned and that provide more natural sunlight to animals that are swimming and diving normally.

1.1.4 Critical Care Animals and Calves

Debilitated and ill cetaceans are often sedentary and tend to float at the surface for long periods of time. Some are unable to swim and dive. Some may require support in order to stay afloat enough to breathe regularly. Young calves may be weak and require assistance. Support may be provided by floatation devices attached to the animal or rehabilitation personnel supporting the animal utilizing a variety of methods. A shallow area that allows the animal to rest on the bottom while keeping its blowhole above the surface may also suffice. This shallow resting shelf must be of sufficient depth for larger animals (over 50 kg) to provide adequate buoyancy to prevent organ-crushing. Small cetaceans may also be supported in a stretcher that is hung within an open aluminum frame while maintaining the water depth at the midline of the animal. These animals must be protected from sun-related skin damage by providing them with shade or covering their exposed skin with an appropriate, non-desiccating sun block that allows proper thermoregulation. Exposed skin may be protected from desiccation with the use of emollients applied to the skin or a water spray.

MINIMUM STANDARD

- Ensure support is available via floatation devices, a shallow resting shelf, sloping beach, suspended stretcher system, or other support for critically ill or neonatal cetaceans that are weak and/or cannot swim normally.
- Monitor animals requiring support.
- Provide sufficient shade.
- Provide a water spray or method for keeping skin moist for cetaceans that cannot swim or dive.
- Control air temperature above the pool to facilitate recovery, protect rehabilitating animals from heat or cold extremes, and prevent discomfort. This may be achieved by heating or cooling the water appropriately for the species and condition of the animal and/or providing shelter from the elements.

1.1.5 Number of Animals Housed in Each Pool/Pen

During multiple or unusual mortality event (UME) strandings the number of cetaceans received by the facility is limited not only by the number and size of the holding pools or pens, but the number of qualified trained rehabilitation staff members available to care for the animals. Due to the intensive 24 hour assistance required for critical care cetaceans, a minimum of two qualified trained staff members are necessary for each and every dependent cetacean on the premises. The maximum number of animals maintained in each pool and onsite at the facility shall be determined by the attending veterinarian and dictated by the number of qualified staff available to care for the animals.

MINIMUM STANDARD

- Provide enough pool space for each animal to swim, dive, and maintain an individual distance of one body length from other animals housed in the same pool.
- Provide 2 qualified trained rehabilitation staff members for every critical care or dependent cetacean weighing less than 250 kg. Larger critical care cetaceans will require more personnel to handle each animal.
- Staff must be available on a 24-hour basis for critical animal care.
- Provide one trained staff member for every 3-4 cetaceans undergoing less critical periods of rehabilitation; during reconditioning or during counter-conditioning if training or desensitization was used for feeding stations, medical procedure desensitization or transport approximations.
- Provide one trained staff member for every five cetaceans that are eating regularly and do not require handling.

RECOMMENDED

- Provide enough pools or pool space to house multiple animals in accordance with the calculated space outlined in the APHIS AWA standards for captive cetaceans.
- Provide three qualified trained rehabilitation staff members for every critical care or dependent cetacean.
- Provide two trained staff members for every 1 – 4 cetaceans undergoing less critical periods of rehabilitation; during reconditioning; or prior to reintroduction.

1.1.6 Housekeeping

MINIMUM STANDARD

- Keep support buildings and grounds as well as areas surrounding rehabilitation pools clean and in good repair.
- Maintain perimeter fences in good repair, and ensure they are an adequate height and construction to keep people, animals, and pests out.
- Ensure primary enclosures housing marine mammals do not have any loose objects, sharp projections, and/or edges which may cause injury or trauma to the marine mammals contained therein.
- Objects introduced as environmental enrichment must be too large to swallow and made of non porous cleanable material that is able to be disinfected. Likewise items such as rub ropes shall be secured to prevent entanglement.
- All drains and overflows must have screened covers.
- Ensure there are no holes or gaps larger than ½ the size of the head diameter of the calf of the smallest species to be housed.

RECOMMENDED

- Coat all pool and haul-out surfaces with a non-porous, non-toxic, non-degradable cleanable material that is able to be disinfected.

1.1.7 Pest Control

MINIMUM STANDARD

- Establish and maintain a safe and effective program for the control of insects, avian and mammalian pests. This should include physical barriers to prevent feral and/or wild animals from contact with the rehabilitating animals.
- Insecticides or other such chemical agents shall not be applied in a primary enclosure housing marine mammals or a food preparation area except as authorized in writing by the attending veterinarian.
- If applied, all appropriate measures must be taken to prevent direct contact with the insecticide/pesticide, whether airborne or waterborne, by the animal.

1.1.8 Security for Facility

Stranded marine mammals often attract public attention and must be protected from excessive commotion and public contact. Ensuring a quiet stress-free environment for rehabilitating animals may improve their chance to recover and survive. Public viewing of marine mammals is discussed in Section 1.13 of this document.

MINIMUM STANDARD

- Locate rehabilitation facilities at sites that have the ability to be secured from the public.
- Prevent direct public contact with the rehabilitating animals but utilizing appropriate fencing, staff and security personnel.

RECOMMENDED

- Maintain 24- hour monitoring when animals are present or maintain a secure perimeter fence with the ability to lock the area off to the public when staff is not present.

1.2 Water Quality

Water quality is an essential part of keeping cetaceans healthy. Sick or debilitated cetaceans should be housed in pools filled with clean, appropriately treated saltwater to facilitate their recovery.

There are four basic types of water systems:

- Pools with filtration systems (closed systems)
- Pools without filtration systems (dump and fill systems)
- Pools with periodic influx of natural seawater (semi-open systems)
- Open water systems (flow-through pools, bay or sea pens)

There are a number of variables which will affect water quality. The number and size of cetaceans utilizing each pool will vary throughout the year at most rehabilitation facilities. During unusual stranding events the number of cetaceans utilizing one pool may increase dramatically, creating a heavier load of waste which must be handled by the filtration system in closed systems and by the amount of water flow-through in semi-open and open systems.

Filtration or life support systems are essential to maintaining clean water for animals held in closed or semi-closed systems. Life support systems have three basic parts; mechanical filters that remove solids, biological filters or baffles to remove or detoxify chemicals in the water, and disinfecting

methods to control or remove pathogens. In addition to maintaining clean water in the animal pools, these systems may be needed to treat waste water, depending on waste water disposal requirements. If a temporary increase in waste production overwhelms part or all of the life support system, a good water quality control program will require alternative options.

The source of water used in closed systems generally is fresh water obtained from municipal sources whereas water in open and semi-open systems comes from a bay or sea source. Municipal fresh water must have salt added to increase the salinity to appropriate levels to maintain cetaceans. Water in closed systems must be regularly filtered through sand and gravel filters to remove particulate matter, and disinfectants such as chlorine or bromine are added at appropriate levels to eliminate pathogens. More elaborate systems utilize ozone to oxidize pathogens in the water. The source should be independent of other rehabilitation and captive animal areas.

Factors that affect water quality are:

- Size of pool or pen
- Efficiency of filtration system or water flow-through rate (tides)
- Water turnover rate
- Number, size and species of animals housed in pool or pen
- Nature and amount of food consumed by animals in pool or pen
- Nature of bottom substrate
- Frequency of cleaning the pool
- Types, amounts, and the frequency with which chemicals are added to the system
- Temperature of the water
- Pathogens in the water
- Biotoxins in open water pens or in pools where the source water comes from the ocean or bay
- Contaminants (oil, pesticides, etc.) in open water pens
- Hazardous waste spills
- Inclement weather
- Sunlight contributing to algae production on pool surfaces, which in turn can support bacteria.

1.2.1 Source and Disposal of Water

The water source for cetaceans housed in closed or semi-closed systems may be municipal water, well water, or water brought into the facility from an adjacent body of water or estuary. The source should be independent of other rehabilitation and captive animal areas.

MINIMUM STANDARD

- Salt water must be readily available to fill pools housing rehabilitating cetaceans unless otherwise directed by the attending veterinarian.
- Fresh water must be available to clean and wash down surrounding areas.
- For pools without adequate filtration systems, drain water from pools daily or as often as necessary to keep the pool water quality within acceptable limits.
- Discharge wastewater in accordance with state or local regulations. Facility managers must seek appropriate authorization to dispose of waste water. Documents of authorization or necessary permits must be kept on site as part of the administrative record and may be requested by NMFS as part of the NMFS Stranding Agreement.
- Chemicals, when necessary, shall be added in appropriate amounts to disinfect the water or adjust the pH, but not added in a manner that could cause harm or discomfort to the animals.
- Have contingency protocols describing how water quality will be maintained during periods of peak animal use.

RECOMMENDED

- Enough salt water must be available to completely fill pools within two hours of draining.
- Maintain a filtration system designed to optimize water quality in each holding pool and decrease water waste.

1.3 Water Quality Testing

It is important to test the water in which the animals live on a regular basis. Coliform bacterial counts are used to monitor the efficiency of the filtration system to eliminate potentially harmful bacteria. Coliform counts should be done at least once per week and more frequently if there are very large or multiple animals utilizing the pool. While coliform numbers may be described as Most Probable Number (MPN) per 100 ml, a more accurate method of measuring coliforms is to determine the total coliform count, or the fecal coliform count.

Temperature of the water is especially important if the animal lacks the ability to thermoregulate. Water may require heating or chilling to aid debilitated animals in their ability to maintain optimal body temperature. Water temperature regulation is not feasible in open water pens, but keeping track of the water temperature in sea pens may aid the staff in making husbandry decisions.

If coliform counts or the water temperature become too high in any system, measures must be taken to correct the problem in a timely manner. A partial-to-total water change may be necessary to correct the problem in a closed or semi-closed system. If the coliform counts are considered too high in sea or bay pens, efforts should be made to circulate clean sea water through the pens using pumps, paddles or other methods of moving water.

Chemicals added to the water may damage eyes and skin, therefore levels must be monitored daily. Emergency chemicals should be on hand such as sodium thiosulfate in case of the accidental hyperchlorination of a system. Salinity may also have an impact on the health of the skin and eyes, as well as the comfort level of the animal, and should be monitored regularly.

1.3.1 Water Quality Tests

MINIMUM STANDARD

- Measure coliform growth weekly.
- Total coliform counts must not exceed 500 per 100 ml or a MPN of 1000 coliform bacteria per 100 ml water. Fecal coliform counts are not to exceed 400 per 100 ml.
- If the above tests yield results that exceed the allowable bacterial count, then two subsequent samples must be taken to repeat the test(s) where the level(s) is/are exceeded. The second sample is to be taken immediately after the initial test result, while the third sample would be taken within 48 hours of the initial test.
- If the averaged value of the three test results still exceeds the allowable bacterial counts, the condition must be corrected immediately or the animals must be moved to a contingency facility.
- Maintain pH between 6.5 and 8.5.
- Maintain salinity between 24 - 35 ppt.
- Maintain the temperature of the water so that it falls within parameters appropriate for the species.
- Measure oxidant levels in systems which require use of a chemical disinfectant and/or ozone in the system (for closed systems).

RECOMMENDED

- Maintain pH between 7.2 and 8.2.
- Total Coliforms with blanks and controls, fecal Coliform, fecal Strep, and yeast count performed at least weekly.

1.3.2 Frequency of Testing in Closed, Semi-Open, or Open Systems

MINIMUM STANDARD

- Measure water temperature, pH, salinity, chemical additives (if applicable) daily in all pools.
- Measure coliform counts weekly; and more frequently at the discretion of the attending veterinarian.

RECOMMENDED

- If ozone systems are used, measure ozone levels regularly in the animal pools. Ozone levels shall not exceed 0.02 mg/liter.
- Test source and discharge water at least once per day or more frequently for "flow through" systems.
- Maintain records for tests with time, level and results – reviewed and signed monthly by the attending veterinarian or the animal care supervisor.

1.3.3 Chemical Additives

Total chlorine = Free chlorine + Combined chlorine.

MINIMUM STANDARD

- Maintain total chlorine below 1.5 ppm, where the combined chlorine shall not exceed 50% of the total chlorine
- All additives must be recorded
- pH may be adjusted chemically – for example – pH may be raised with sodium carbonate, or soda ash; or lowered with HCl or CO2; but not added in a manner that could cause harm or discomfort to the animals.
- Maintain Material Safety Data Sheet (MSDS) information and signage as well as appropriate handling equipment for the addition of chemicals.

1.3.4 Water Circulation

The amount of water turnover through the filtration system in a closed or semi-open system is important to maintain water quality by removing organic waste and particulate matter. Likewise the amount of water movement through an open water pen is also important in the maintenance of water quality. Generally, adequate tidal action will result in the equivalent of two complete water changes per day.

MINIMUM STANDARD

- Maintain sufficient turnover of water through the filtration system in closed or semi-open systems to keep the water quality at or above acceptable limits, with a minimum of two complete water changes per day.
- Ensure methods for moving water (water paddles, pumps, spray devices) are available to aerate and move water in open water pens with insufficient flow of tides or water through the enclosures. These methods should be sufficient to provide the equivalent of two water changes per day.

RECOMMENDED

- A minimum full water turnover rate of every four hours for each pool in closed or semi-open systems.

1.3.5 Salinity

Acceptable salinity levels are dependant on the species and condition of the cetacean and the duration of the stay. Most species of cetaceans require a salinity level greater than 24 ppt in order to maintain healthy skin and eyes. Occasionally the attending veterinarian may chose to house the cetacean in fresh or nearly fresh water for a period not exceeding 3 days. Reasons for maintaining cetaceans in fresh or brackish water should be noted in the veterinary record and signed by the veterinarian. Some species of cetacean are better adapted to live in brackish water and may do well in lower salinity levels than other species.

MINIMUM STANDARD

- Maintain salinity levels over 24 ppt unless a written veterinary plan calls for lower salinity levels, or if the animals are housed in sea pens nearby their resident range.

RECOMMENDED

- Ideal salinity levels should approach natural ocean salinity levels (30 – 33 ppt) but acceptable industry standards suggest maintaining cetaceans in water with salinity levels over 24 ppt.

1.3.6 pH

MINIMUM STANDARD

- Maintain pH in a range between 6.5 to 8.5.

RECOMMENDED

- Maintain pH between 7.2 –8.2.

1.3.7 Water Temperature

Many species of cetaceans are adapted to maintain normal body temperatures when living in a broad range of water temperatures. Healthy *Tursiops* have been housed successfully in water ranging from 50^{o} to 80^{o} F. Atlantic white-sided dolphins fail to thrive in water over 80^{o} F and North Atlantic harbor porpoise do best in 45 to 65^{o} F. Some warmer water species, such as a Vaquita, will require consistent warm water environments. It is therefore important to know if the species being rehabilitated comes from a polar, temperate or tropical climate. It is of equal importance to know the temperature range of water in their primary habitat. Young, underweight, and debilitated animals may also require warmer water than found in their primary habitat.

Cetaceans such as bottlenose dolphins adjust their blubber thickness seasonally in response to water temperature. This must be considered when readying rehabilitated animals for release. Therefore animals should be acclimated to an appropriate seasonal water temperature prior to release.

MINIMUM STANDARD

- Hold water temperatures within the normal seasonal habitat temperature range for the species under rehabilitation unless otherwise authorized by the attending veterinarian in writing.
- Provide methods to heat and maintain warm water environments for species that require it, or for debilitated individuals that are incapable of maintaining appropriate body temperature.
- Monitor the temperature of water being heated or cooled.
- Design water systems to minimize the chance of rehabilitating cetaceans from becoming hyperthermic or hypothermic.

RECOMMENDED

- Monitor blubber thickness ultrasonically.

1.4 Quarantine

Cetaceans brought to a rehabilitation facility have no medical history and may carry diseases communicable to other marine mammals, other animals, or humans. Likewise, these animals are often debilitated and may suffer from a variety of illnesses which may compromise their immune systems making them susceptible to diseases from other animals and/or the rehabilitation environment. Quarantine areas must be available and proper biosecurity protocols must be in place for all incoming animals at rehabilitation facilities.

Direct contact between the general public and cetaceans undergoing rehabilitation should be avoided because of the zoonotic risk from pathogens carried by marine mammals. There have been documented cases of Brucella, Erysipelothrix, and Blastomyces being passed from cetaceans to humans.

Listed on the following website are numerous other potentially zoonotic marine mammal pathogens (see http://www.vetmed.ucdavis.edu/whc/mmz/). See also: *2004 UC Davis Wildlife Health Center Report for the Marine Mammal Commission – Assessment of the Risk of Zoonotic Disease Transmission to Marine Mammal Workers and the Public: Survey of Occupational Risks.*

MINIMUM STANDARD

Maintain sufficient quarantine facilities and space for appropriate quarantine of incoming animals or for holding animals with contagious diseases.

1.4.1 Prevention of Animal to Animal Transmission of Diseases

- Quarantine all new animals in a separate dedicated quarantine area and provide pools that can be isolated with the use of dividers, tarps, or physical space from the rest of the animal housing areas.
- Have separate filtration and water flow systems for pools in quarantine/isolation areas.
- Use dedicated protective clothing for personnel.
- Use foot baths, glove baths, and methods to disinfect clothing, wet suits, or exposure suits between handling animals within quarantine area and outside of quarantine area.
- Maintain equipment and tools strictly dedicated to the quarantine areas.

- Provide dividers between pens and pools that prevent washdown or splash from moving from one pool to another.
- Provide sufficient space; ideally greater than 20 feet or 6 meters; or solid barriers between animal enclosures to prevent direct contact – including splashed pool water and airborne disease transmission.
- Ensure sufficient air turnover in indoor facilities to prevent transmission of disease. Air turnover should be enough to prevent build-up of heat or chemical fumes and provide a method of bringing fresh air into the facility. There should be sufficient venting or openings to allow movement of air throughout the facility.
- Implement specific quarantine and sanitation procedures to prevent transmission of disease through fomites (personnel, clothing, equipment).
- Thoroughly clean and disinfect buckets, hoses, scales, transport equipment, and cleaning equipment that is moved between animal areas to prevent transmission of pathogens via fomites.
- Place open water pens so effluent is not near water intake.
- Require evaluation and written veterinary approval before placing animals together after quarantine period has been met.

RECOMMENDED

- Provide separate air handling system in indoor facilities.
- Clean and disinfect quarantine pools between uses.

1.4.2 Prevention of Domestic Animal to Marine Mammal Transmission of Disease

- Ensure appropriate fencing and placement of holding pens prevents direct contact between rehabilitating cetaceans and domestic animals.
- Prohibit personal pets from entering the facility and facility grounds. Pets must stay outside the perimeter fence at all times.
- Place foot baths at the entry and exit of animal areas.
- Require quarantine and sanitation protocols are followed to prevent transmission of disease through fomites such as wet suits and equipment.

1.4.3 Prevention of Wild Animal to Marine Mammal Transmission of Disease

- Ensure perimeter fencing will prevent wildlife from entering the rehabilitation premises.
- Provide appropriate rodent and bird control on the premises. Ensure net pens and lagoon areas have sufficient secondary fencing to keep wildlife from coming in direct contact with the animals housed in the net pens.

1.4.4 Prevention of Marine Mammal to Domestic Animal Transmission of Disease

- Provide appropriate perimeter fencing.
- Require animal personnel to change contaminated clothing and/or disinfect before leaving the rehabilitation premises.
- Require that specific quarantine and sanitation procedures are taken to prevent transmission of disease through fomites such as clothing and equipment.

1.4.5 Prevention of Stranded Marine Mammal to Captive Marine Mammal Transmission of Disease

- Train volunteers and staff to follow appropriate quarantine protocols.
- Establish quarantine protocols that take into consideration the changing status of the stranded animal.
- Establish traffic flow so that volunteers or staff working with stranded animals do not inadvertently travel into a collection animal area.
- Establish decontamination protocols before volunteers or staff members exposed to stranded animals may enter a collection animal area.
- Establish separate restrooms, showers, changing rooms, food preparation areas, etc. for staff and volunteers working with rehabilitating vs. collection animals. Food for rehabilitating animals may be prepared in the collection animal kitchen and taken to the rehabilitation animal area, however any bucket, feed implement or other item must be thoroughly disinfected before it may return to the collection animal area.

1.4.6 Methods to Reduce Spread of Disease from Animals Housed in Open Sea/Bay Pen Systems

- Consideration of substrate, water depth and public access when selecting a site for a sea or bay pen.
- Placement of pens in a secluded area where wild animals and marine mammals are unlikely to come into direct contact with the animals housed in the sea/bay pens; nets should be sufficiently rigid to prevent entanglement by mammals or fish.
- Placing a second set of perimeter nets 10 meters from the sea/bay pens to prevent direct contact with wild marine mammals.
- Do not place sea/bay pens within 1000 meters of any major outflow of storm drains or sewage treatment plants and consider the flow direction or current from these major outflows.
- Place the sea/bay pens over 500 meters and downstream from water intake pipes that bring water into facilities that house marine mammals.
- Place pens in an area where there is ample flow-through of tides/currents.
- Ensure the pens are of sufficient size to minimize biomatter build-up. Each cetacean should be housed in a pen that has a minimum depth of half of their body length, and a minimum horizontal dimension of 24 feet or two full body lengths, whichever is greater.
- Avoid overcrowded pens. Animals may fight with each other when housed too closely together. Likewise they must be able to swim and dive normally to maintain optimal muscle condition.
- Have equipment to pump or aerate the water in pens that do not have sufficient tidal action to ensure a minimum of two complete water changes per day.
- Place pens in areas where there is sufficient depth to enhance water circulation and reduce pathogen build-up. Daily coliform testing will determine if pathogen build-up exists.
- Place quarantine pens such that tidal action or underwater currents will not flow through sea pens housing healthy animals.

1.4.7 Evaluation Requirements Before Placing Marine Mammals Together

- Complete blood count (CBC)/Chemistries, appropriate cultures, physical examination before moving animals out of quarantine area.
- Review current NMFS recommendations on diseases of concern (i.e. Morbillivirus) and reportable disease (i.e. Brucella and West Nile virus).

- Consider screening for morbillivirus, herpes virus, Brucella, Leptospira, and Toxoplasma utilizing the most current diagnostic tests available.
- If animals are part of a UME, then screening for diseases must be more thorough and in direct coordination with NMFS and through UME coordinators.
- Have contingency plan for animals that are carriers of or actively infected with reportable disease such as brucellosis, herpes virus, leptospirosis, toxoplasmosis, and morbillivirus.

1.4.8 Zoonotic Considerations

- Restrict public access and direct contact with cetaceans due to zoonosis potential and public health hazard of non-trained individuals interacting with sick and injured marine mammals.
- Train staff and personnel about how to prevent contracting zoonotic diseases (*Occupational and Safety Information for Marine Mammal Workers* http://www.vetmed.ucdavis.edu/whc/mmz/).
- Train staff and personnel working directly with stranded cetaceans how to recognize symptoms of zoonotic disease.
- Provide safety equipment such as protective clothing, eye protection and face masks.
- Provide eye flushing stations as used with hazardous materials (HAZMAT) or normal saline bottles to irrigate the eyes.
- Staff with open wounds shall not enter the pool of animals carrying potentially infectious diseases.
- Persons with disabilities, respiratory conditions, infectious diseases or infectious skin conditions shall not enter pools with rehabilitating cetaceans.
- Train staff the basics of sanitation and properly handling contaminated equipment.

1.4.9 Pre-Release Guidelines

- Pre-release health screens and serologic requirements are directed by the NMFS Regional Stranding Coordinator, in coordination with Marine Mammal Health and Stranding Response Program.

1.5 Sanitation

MINIMUM STANDARD

1.5.1 Primary Enclosure Sanitation

- Remove animal and food waste in areas other than the rehabilitation pool from the rehabilitation enclosure at least daily, and more often when necessary to prevent contamination of the marine mammals contained therein and to minimize disease hazards.
- Remove particulate animal and food waste from rehabilitation/exercise pools at least once daily, but as often as necessary to maintain water quality and to prevent increased health hazards to the marine mammals that use the pools.
- Remove trash and debris from pools as soon as it is noticed, to preclude ingestion or other harm to the animals.
- Clean the walls and bottom surfaces of the rehabilitation/exercise pools as often as necessary to maintain proper water quality.
- Prevent animals from coming in direct contact with disinfectants or aerosolized disinfectants from spray or cleaning hoses.

RECOMMENDED

- Empty and allow pools to dry once each year but dry and hyperchlorine pool bottoms and walls after each use by sick cetaceans.

1.5.2 Sanitation of Food Preparation Areas and Food Receptacles

- Use separate food preparation areas and supplies for rehabilitation vs. collection animals.
- Clean food containers such as buckets, tubs, and tanks, as well as utensils, such as knives and cutting boards, or any other equipment which has been used for holding, thawing or preparing food for marine mammals after each feeding with detergent and hot water and sanitize with an appropriate disinfectant approved for use in food areas at least once a day.
- Clean kitchens and other food handling areas where animal food is prepared after every use, and sanitize at least once weekly using standard accepted sanitation practices.
- Store substances such as cleaning and sanitizing agents, pesticides and other potentially toxic agents in properly labeled containers away from food preparation areas.
- Post MSDS “right to know” documents for staff utilizing cleaning and animal treatment chemicals and drugs.

1.6 Food, Handling, and Preparation

During rehabilitation food for marine mammals shall be wholesome, palatable, free from contamination, and of sufficient quantity and nutritive value to allow the recovery of the animals to a state of good health. Live fish may be fed during rehabilitation but preferences should be given to native prey species. Live fish may contain parasites which could infect compromised animals. Feeding regimens should simulate natural patterns in terms of frequency and quantity to the extent possible while following a prescribed course of medical treatment. Most cetaceans feed repeatedly during a given day.

1.6.1 Diets and Food Preparation

MINIMUM STANDARD

- Prepare the diets with consideration for age, species, condition, and size of marine mammals being fed.
- Feed cetaceans a minimum of three times a day, except as directed by a qualified veterinarian or when following professionally accepted practices.
- Diets reviewed by a nutritionist, attending veterinarian, or the animal care supervisor.
- Train staff to recognize good and bad fish quality.
- Feeding live fish may be required for release determination. See *NMFS /FWS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release* for more information regarding feeding live fish.
- Food receptacles should be cleaned and sanitized after each use. Food preparation and handling should be conducted so as to minimize bacterial or chemical contamination and to ensure the wholesomeness and nutritive value of the food.

RECOMMENDED

- Feeding patterns should simulate natural patterns in terms of frequency and quantity which may require food to be offered 5 – 10 times daily.

1.6.2 Food Storage and Thawing

MINIMUM STANDARD

- Frozen fish or other frozen food shall be stored in freezers which are maintained at a maximum temperature of 0º F (-18ºC).

- The length of time food is stored and the method of storage, as well as the thawing of frozen food should be conducted in a manner which will minimize contamination and which will assure that the food retains optimal nutritive value and wholesome quality until the time of feeding.
- Freezers should only contain fish for animal consumption. Human food or specimens should not be placed in the fish freezer.
- Experienced staff should inspect fish upon arrival to ensure there are no signs of previous thawing and re-freezing, and check temperature monitoring devices in the transport container. The fish shipment should be refused or the fish discarded if temperature fluctuations occurred during transport.
- Freezers shall be of sufficient size to allow for proper stock rotation.
- All foods shall be fed to the marine mammals within 24 hours following the removal of such foods from the freezers for thawing.
- If the food has been thawed under refrigeration it must be fed to marine mammals within 12 hours of complete thawing.
- When fish is thawed in standing or running water, the coldest available running water must be used to prevent excess bacterial growth.
- To ensure optimal quality of the fish, and to prevent bacterial overgrowth, do not allow fish to reach room temperature or sit in direct sunlight.
- The thawed fish shall be kept iced or refrigerated until a reasonable time before feeding. This time will vary with ambient temperature.
- Prepared formula should be fed immediately or refrigerated and fed to the marine mammals within 24 hours of preparation. Formula, once heated to an appropriate temperature for a feed, shall be discarded if it is not consumed within one hour.

RECOMMENDED

- Calculate kilocalories of each type of fish or food items fed to each animal daily.
- Conduct food analysis for protein, fat and water content of each lot of fish used.
- Culture the slime layer from the fish lot prior to thawing for *Erysipelothrix*.

1.6.3 Supplements

MINIMUM STANDARD

- Each animal shall receive appropriate vitamin supplementation which is sufficient and approved in writing by the attending veterinarian.

1.6.4 Feeding

MINIMUM STANDARD

- Food, when given to each marine mammal individually or in groups, must be given by personnel who have the necessary training and knowledge to assure that each marine mammal receives and eats an adequate quantity of food to maximize its recovery or maintain good health. Such personnel is required to recognize deviations in each animal being rehabilitated such that intake can be adjusted and/or supplemented accordingly.

1.6.5 Public Feeding

MINIMUM STANDARD

- Public feeding of animals that are being rehabilitated is **strictly** prohibited.
- Feeding must be conducted only by qualified, trained personnel.

1.6.6 Feed Records

MINIMUM STANDARD

- Maintain feed records on each individual animal noting the actual (not an estimate) individual daily consumption for each animal by specific food type.
- If non-critical animals are housed in groups and are broadcast-fed, then daily individual food consumption estimates are acceptable
- Weigh food before and after each feeding and the record the amount consumed.
- Obtain body weight or girth measurements at least weekly from debilitated easily-handled animals. Girth measurements are taken at the level of the axilla and the anterior insertion of the dorsal fin. Girth measurements are generally less stressful to obtain than weighing the animal.
- Girth measurements or body weight should be obtained as often as practical in the later stages of rehabilitation without causing undue stress to the animal.

1.7 Veterinary Medical Care

All rehabilitation facilities shall have an attending veterinarian. The attending veterinarian is critically involved in making decisions regarding medical care as well as housing and husbandry of resident and newly admitted patients.

1.7.1 Veterinary Experience

MINIMUM STANDARD

The attending veterinarian shall:

- Assume responsibility for diagnosis, treatment, and medical clearance for release or transport of marine mammals in rehabilitation (50 CFR 216.27).
- Ability to provide a schedule of veterinary care that includes a review of husbandry records, visual and physical examinations of all the marine mammals in rehabilitation, and a periodic visual inspection of the facilities and records.
- Be available to examine animals on a regular schedule and emergency basis; daily if necessary.
- Be available to answer veterinary questions on a 24 hour basis.
- Have marine mammal experience or be in regular consultation with a veterinarian who has marine mammal experience and have access to a list of expert veterinarians to contact for assistance.
- Have an active veterinary license in the United States (means a person who has graduated from a veterinary school accredited by the American Veterinary Medical Association Council on Education, or has a certificate issued by the American Veterinary Graduates Association's Education Commission for Foreign Veterinary Graduates), or has received equivalent formal education as determined by NMFS Administrator (adapted from the Animal Welfare Act Regulations 9 CFR Ch. 1).
- Have the skills to be able to draw blood from, and give injections to the species most commonly encountered at the rehabilitation center.
- Be available to examine animals immediately upon admittance to a facility.
- Be available to assess animals during a mass stranding directly or indirectly through trained and qualified primary responders.
- Have contingency plan for veterinary backup.
- Have the appropriate registrations and licenses (e.g., registered with the Drug Enforcement Administration for handling controlled substances) to obtain the necessary medications for the animals housed at that rehabilitation facility.
- Be able to conduct a full post-mortem examination on all species of cetaceans treated at the facility.
- Be knowledgeable and able to perform cetacean euthanasia.
- Be knowledgeable about species-specific pharmacology.

- Must certify in writing that animals are fit for transport.
- Ability to write and submit timely disposition recommendations for marine mammals in rehabilitation.
- Be knowledgeable of marine mammal zoonotic diseases.

RECOMMENDED

All of the above plus:

- Membership in the International Association for Aquatic Animal Medicine.
- Have access to a current version of the CRC "Handbook of Marine Mammal Medicine"
- Complete a course that offers basic medical training with marine mammals such as Seavet, Aquavet, or MARVET.
- Have a minimum of one year of clinical veterinary experience post graduation.
- Have at least one year clinical experience working with the marine mammal type(s) most frequently admitted to the rehabilitation facility
- Be full time employees or contracted veterinarian experienced in cetacean medicine at facilities managing an average of 5 live cetacean cases per year.

1.7.2 Veterinary Program

MINIMUM STANDARD

- Veterinary care for the animals must conform with any State Veterinary Practice Act or other laws governing veterinary medicine which applies to the state in which the facility is located.
- Standard operating procedures should be reviewed and initialed by the attending veterinarian or the animal care supervisor annually and/or whenever the document is changed or updated. This document may be reviewed by NMFS as part of the NMFS Stranding Agreement or as part of inspections.
- Staff caring for animals should be sufficiently trained to assist with veterinary procedures under the direction of the veterinarian and the rehabilitation facility should maintain at least one **Animal Care Supervisor** who is responsible for overseeing prescribed treatments, maintaining hospital equipment, and controlling drug supplies. The person should be adequately trained to deal with emergencies until the veterinarian arrives, be able to direct the restraint of the animals, be responsible for administration of post-surgical care, and be skilled in maintaining appropriate medical records. It is important that the animal care supervisor should communicate frequently

and directly with the attending veterinarian to ensure that there is a timely transfer of accurate information about medical issues.

- Veterinary decisions shall be based on "best practices" (i.e., based on informed opinions and expertise of veterinarians practicing marine mammal medicine).
- A schedule of veterinary care which includes a review of husbandry records, visual and physical examinations of the animals, and a visual inspection of the facilities should be implemented.
- A health and safety plan for the staff shall be written and accessible at all times. It shall be reviewed by the attending veterinarian or the animal care supervisor annually or as prescribed by the NMFS Stranding Agreement. Also, it may be beneficial to consult with an occupational health medical professional when developing these plans. All animal care staff will be familiar with the plan. The plan shall include protocols for managing bite wounds.

The following reports may be requested annually by NMFS as required under the NMFS Stranding Agreement or as a part of inspections:

- Standard Operating Procedure (SOP) reviews
- Health and Safety Plan reviews
- Animal acquisitions and dispositions
- National Oceanic and Atmospheric Administration (NOAA) Form 89864, Office of Management and Budget (OMB) #0648-0178 (Level A data)
- NOAA Form 89878, OMB#0648-0178 (Marine Mammal Rehabilitation Disposition Report)
- Case summaries for any rehabilitation performed at a facility, including narrative descriptions of the cases as well as spreadsheets of treatments, blood values, etc.

1.8 Laboratory Tests and Frequency of Testing

Specific requirements for tests will be issued by the NMFS stranding coordinator (or UME Onsite Coordinator) in each region as outlined in the Marine Mammal Health and Stranding Response Program for release determinations, surveillance programs and UME investigations. Routine diagnostic sampling and testing protocols will be determined by the attending veterinarian. NMFS must be provided adequate time and information including a veterinary certificate of health before an animal is released as directed in 50 CFR 216.27 (see *NMFS/FWS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release*).

1.8.1 Laboratory Testing

MINIMUM STANDARD

- CBC/Serum Chemistry- For most cases, all animals shall have a minimum of two blood samples drawn for CBC with differential and serum chemistry; upon admission and prior to release (see *NMFS/FWS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release*). If duration of rehabilitation is shorter than a week, one blood workup may suffice and is at the attending veterinarian's discretion.
- Fecal analysis for parasites - Fecal tests for parasites shall be run upon admission of each animal at the discretion of the attending veterinarian.
- Serology as necessary for release determination based on direction of the NMFS stranding coordinator and the Marine Mammal Health and Stranding Program and for additional clinical diagnosis as deemed appropriate by the attending veterinarian.
- The administration of drugs with potential adverse side-effects may require additional testing. For example, the use of ototoxic antibiotics may require subsequent testing of hearing abilities of the animal prior to consideration for release.
- The attending veterinarian or a trained staff member shall perform a necropsy on every animal that dies within 24 hours of death if feasible. If necropsy is to be performed at a later date (ideally no longer than 72 hours postmortem), the carcass should be stored appropriately to delay tissue decomposition.
- Carcass disposal shall be handled in a manner consistent with local and state regulations.
- Perform histopathology on select tissues from each animal that dies at the discretion of the attending veterinarian. A complete set of all major tissues should be evaluated if the animal dies of an apparent infectious disease process.
- Culture and other diagnostic sampling shall be conducted as directed by the attending veterinarian to determine the cause of stranding or death.
- Contact NMFS for additional laboratory test requirements in all cases of unusual mortality outbreaks or disease outbreaks. More complete testing may be required for diseases of concern.
- For cases involving release decisions, unusual mortality investigations, or surveillance programs, serologic assays may only go to labs that have validated tests approved by NMFS, especially for release decisions or determinations. Guidance will be provided by the NMFS Stranding Coordinators or UME Onsite Coordinator.

- Notify the NMFS Stranding Coordinator of learning of any diseases of concern (e.g., emerging, reportable, and/or zoonotic diseases) that are detected and/or confirmed that could be a potential hazard for public health or animal health (NMFS will provide guidance on reportable diseases as it becomes available).
- NMFS must be provided adequate time and information (including veterinary certificate of health) before the animal is released in all cases as directed in 50 CFR 216.27 (see NMFS Standards for Release). This information is required under 50 CFR 216.27(a) and must be submitted 15 days prior to release unless advanced notice is waived by the NMFS Regional Administrator. Guidance on the waivers is provided in the *NMFS/FWS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release.*

RECOMMENDED

- Complete necropsy performed by the attending veterinarian or a pathologist within 24 hours of death.
- Full histopathology done on tissues from each animal that dies of apparent infectious disease.
- Bank 1cc of serum per blood draw in –80^{o} F freezer.
- Bank heparinized plasma (green top) tube in –80 ^{o} F one per animal.
- Reproductive status shall be evaluated upon admission and prior to release through analysis of serum progesterone and estrogen levels in females, and testosterone in males. Elevated hormone values in females upon admission will require re-sampling within the first two weeks to assess pregnancy. Monitoring by means of monthly blood sample collection and analysis through the course of rehabilitation is strongly advised. If possible, sampling will be done in conjunction with ultrasonic examination of reproductive tracts.

1.9 Record Keeping and Data Collection

Record keeping is an essential part of the rehabilitation process. Not only do accurate and complete medical records for each stranded cetacean allow the staff to provide consistent and optimal care for each animal, but retrospective records help scientists and veterinarians to make better evaluations on how to treat individuals.

1.9.1 Record Keeping

MINIMUM STANDARD

- Record and report the "Marine Mammal Stranding Report - Level "A".

- Complete the require NMFS Marine Mammal Rehabilitation Disposition Report NOAA 89-878, OMB #0648-0178.as in accordance with the NMFS Stranding Agreement
- Maintain and update individual medical records daily on each animal at the rehabilitation center.
- Individually identify each animal with unique field number.
- Keep an accurate description of the animal, including identification/tag number, date and location of stranding, sex, weight, and length at stranding.
- Subjective, objective, assessment and plan (SOAP) based records are preferred.
- Include food intake and medication administered to each animal in the daily records.
- Weight
    a. Recorded weekly for underweight cetacean calves or as authorized in writing by the attending veterinarian.
    b. Taken as often as possible for underweight animals without causing undue stress to the animal.
    c. Recorded on admission and prior to release for larger cetaceans.
- Measure body weight, girths (axilla and anterior insertion of the dorsal fin) and standard straight-line and length upon admission, and within one week of release/placement.
- Measure blubber thickness (ultrasonically) at standard sites upon admission, and monitor monthly throughout the course of rehabilitation, with a goal of matching blubber to seasonal water temperatures.
- Weigh the animal as practical, keeping in mind that obtaining the weight of the animal may be stressful.
- Record all treatments, blood work, test and results and daily observations in the medical records.
- Maintain individual medical records for each animal. Medical records remain on site where the animal is housed and are available for NMFS on site review upon request as stated in the NMFS Stranding Agreement.
- Maintain medical records in an accessible format on site for a minimum of 15 years.
- Maintain up to date water quality records for a minimum of two years.
- Maintain life support system maintenance records.
- Maintain records of water quality additives.

RECOMMENDED

- Full set of standard morphometrics prior to release.
- Photographic documentation, identifying marks, lesions.

- Caloric value of daily food intake calculated and recorded for each animal each day
- Daily weight of calves or emaciated animals at the discretion of the attending veterinarian.
- Maintain food acquisition and analysis records.
- Maintain "paper copy" archive of required NMFS records.

1.9.2 Data Collection

MINIMUM STANDARD

- Written documentation of the medical history, food and observation records must be kept.
- NMFS Required Forms to be completed in writing or submitted electronically in the NMFS National Marine Mammal Stranding Database as prescribed in the NMFS Stranding Agreement:
  a. Marine Mammal Stranding Report – Level A (NOAA 89-864, OMB #0648-0178)
  b. Marine Mammal Rehabilitation Disposition Report (NOAA 89-878, OMB #0648-0178)

RECOMMENDED

- Computerized documentation with hard copies.
- Ability to network with other institutions.
- Maintain real-time accessible compiled comparative data.

1.10 Euthanasia Protocols

MINIMUM STANDARD

- Each institution must have a written euthanasia protocol signed by the attending veterinarian.
- Persons administering the euthanasia must be knowledgeable and trained to perform the procedure.
- Maintain a list of individuals authorized to perform euthanasia signed by the veterinarian.
- Euthanasia shall be performed in a way to minimize distress in the animal.
- Refer to resources such as the American Veterinary Medical Association Panel Report on Euthanasia, the CRC Press Handbook of Marine Mammal Medicine and American Association for Zoo Veterinarians Guidelines for Euthanasia of Nondomestic Animals.
- Appropriate drugs for euthanasia in appropriate amounts for the largest species admitted to the facility shall be maintained in stock on site in an appropriate lockbox or under the control of a licensed veterinarian with a current Drug Enforcement Administration (DEA) license.
- Drugs for euthanasia shall be kept with an accurate inventory system in place.

- DEA laws and regulations and any applicable State Veterinary Practice Acts must be followed when using controlled drugs.
- NMFS may request this information (protocols and DEA number) as part of the NMFS Stranding Agreement.

1.11 Health and Safety Plans for Personnel

There shall be a health and safety plan on site at each rehabilitation facility that identifies all health and safety issues that may be factors when working closely with wild marine mammals. The plan should identify all potential zoonotic diseases as well as including safety plans for the direct handling of all species and sizes of cetaceans seen at that facility. Rehabilitation facilities are encouraged to comply with Occupational Safety and Health Administration regulations.

MINIMUM STANDARD

- Identify all potential zoonotic diseases in a written document available to all personnel.
- Include safety plans for the direct handling of all species and sizes of cetaceans seen at that facility.
- Include safety plan for dealing with handling any untreated discharge water.

1.12 Contingency Plans

Contingency plans shall be in place at each facility and may be required by NMFS as part of the NMFS Stranding Agreement. NMFS may require approved variances or waivers prior to planned projects such as construction, and NMFS may not allow rehabilitation efforts to occur under some circumstances. These plans should addresses in detail the operation of the facility and care of the animals under the following conditions:

- Inclement weather plan, including a hurricane/big storm plans where appropriate.
- Construction in the vicinity of the animal rehabilitation pools recognizing the potential and documented adverse impacts of construction on cetaceans, and including specific reference to how noise, dust, debris, and construction worker access will be controlled, how and how frequently animal health will be monitored, and specific criteria for when construction shall be halted or the animals will be moved to another site out of the construction area if the animals appear to be adversely impacted.
- Power outages, including plans of how to maintain frozen fish stores and life support systems.

- Water shortages.
- "Acts of God" plan which may include floods, earthquakes, hurricanes or other unpredictable problems known to occur on occasion in the region where the facility is located.

1.13 Viewing

NMFS Regulation, U.S.C. 50 CFR 216.2(c)(5) states that marine mammals undergoing rehabilitation shall not be subject to public display. The definition of public display under U.S.C. 50 CFR is "an activity that provides opportunity for the public to view living marine mammals at a facility holding marine mammals captive". Only remote public viewing or distance viewing should be allowed and only when there is no possible impact of the public viewing on the animals being rehabilitated. There is a regulatory requirement for a variance or waiver by NMFS for facilities planning to offer public viewing of any marine mammal undergoing rehabilitation.

1.14 Training and Deconditioning Behaviors

Basic behavioral conditioning of wild cetaceans for husbandry and medical procedure may be warranted during rehabilitation as long as every effort is made to limit reinforced contact with humans. Such conditioning may reduce stress for the animal during exams and acquisition of biological samples. Conditioning may assist with appetite assessment and ensuring that each animal in a group receives the appropriate amount and type of diet and medications.

In some cases, extensive contact with humans, including training, may benefit resolution of the medical case by providing mental stimulation and behavioral enrichment, and may facilitate medical procedures. The relative costs and benefits of training should be evaluated by the attending veterinarian and animal care supervisor and the likelihood of contact with humans following release should be considered. Seeking advice from a qualified cetacean behaviorist (with at least 3 years of experience) may be beneficial.

Behavioral conditioning of cetaceans must 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. If an animal has become accustomed to hand-feeding or boat-following, the animal may approach humans after release. Therefore, these behaviors should be deconditioned or counter-conditioned before the animals can be considered for release. Most behaviors will extinguish through lack of reinforcement, but some may require more concentrated efforts.

Training for research that is above and beyond the scope of normal rehabilitation practices can be approved on a case-by case basis under a NMFS scientific research permit. An exception can be made if the attending veterinarian, facility, and NMFS officials all agree that the research will not be detrimental to the animals' health and welfare and will not impede their ability to be successfully released back to the wild.

2. Standards for Pinniped Rehabilitation Facilities

2.1 Facilities, Housing, and Space

Pools for stranded pinnipeds must be appropriate for the basic needs of the animal including buoyancy and thermoregulation. Debilitated pinnipeds often cannot swim and will avoid water if offered, preferring a haul-out space to a pool. Pinnipeds arriving in a debilitated condition have different needs and may not require pools initially. If no pool is provided to the animal, means of keeping it wet and protected from direct sunlight is essential. The upper critical temperature of California sea lions is lower than most land-dwelling mammals at 24°C (75°F) and with limited thermoregulatory ability, they have special habitat needs in captivity. While dry sea lion coats absorb about 74% and wet California sea lion coats absorb almost 92% of all types of shortwave radiation respectively, a California sea lion with a wet coat exposed to direct sunlight could easily overheat on a hot day if there were no other method to cool the animal. (Langman *et al.*, 1996).

Social compatibility should be considered as a part of appropriate housing. Pinnipeds known to be social should be housed with compatible species whenever possible. Placing larger, more robust animals in separate pens, away from the smaller, weaker, or less dominant animals may enhance the success of the rehabilitation efforts for the weaker animals.

It is up to the attending veterinarian and experienced rehabilitation staff, to decide how to house the animal most appropriately based on their experience, observations, and physical examination.

Each animal admitted to a rehabilitation center should be placed in a quarantine holding area and have a full health evaluation performed by the attending veterinarian, Sufficient quarantine time should be allowed for results from tests and cultures to be evaluated before the animal is placed with animals that are apparently disease free. Pinnipeds with evidence of infectious disease must be held in separate areas from other rehabilitating animals to prevent transmission of disease. There should be sufficient isolation areas to accommodate incoming animals with evidence of disease utilizing methods to control aerosol and water-borne exposure to other on-site animals. (See Section 2.4 Quarantine).

During multiple or unusual stranding situations such as hazardous waste spills, catastrophic weather events, toxic algal blooms, or other events leading to unusually high morbidity or mortality, rehabilitation centers may need to adjust the number of animals that would be normally housed in each pen, pool, or bay or ocean pen. The attending veterinarian will be responsible for assuring that

numbers of animals housed in one pool or pen will be appropriate based on the situation. The number of qualified animal care personnel available to care for the animals could be a limiting factor on how many animals may be housed at each facility.

Care should be taken when hand rearing neonatal otariids, as some species frequently imprint on their caregivers rendering them unsuitable for release. A plan for placing animals in a permanent captive environment should be in place in advance for pinniped pups that are ultimately deemed unreleasable.

NMFS Regulation, U.S.C. 50 CFR 216.2(c)(5) states that marine mammals undergoing rehabilitation shall not be subject to public display. The definition of public display under U.S.C. 50 CFR is "an activity that provides opportunity for the public to view living marine mammals at a facility holding marine mammals captive" (See Section 2.13 Viewing).

2.1.1 Pool Requirements

MINIMUM STANDARD

- Pools shall be available for all pinnipeds under rehabilitation. Critical care animals may be temporarily held without water access at the discretion of the attending veterinarian.
- Critically ill animals or young pups are to be housed appropriately, with the pool size and depth as well as the dry resting area determined by the discretion of the attending veterinarian.
- Pools shall be deep enough for each animal to completely submerge, and shall be at least 0.76 meters or 2.5 feet deep. An exception to this would be temporary pools for young pups or debilitated animals.
- Pools shall be large enough in diameter to allow each animal housed therein to swim.

RECOMMENDED

- Pools shall have a MHD of 1 meter or 1.5 x the length of the largest animal utilizing the pool, whichever is larger.
- The minimum surface area of the pool for non-critical animals shall be at least equal to the dry resting area required by USDA, APHIS AWA standards, but using the actual length of the largest animal in the enclosure instead of the average adult length.
- The pool shall be at least 0.91 meters deep or one-half the actual length of the longest species contained therein, whichever is greater.

- If adult pinnipeds are commonly rehabilitated, facilities should be designed to accommodate the average number of adult-sized animals that strand each year, and have at least one pool and haul-out area that meet USDA APHIS AWA standards.

2.1.2 Dry Resting Area

MINIMUM STANDARD

- One non-critical animal; area of dry resting area = 1.2 x (length of the animal)^2.
- Two non-critical animals; area of dry resting area = 1.5 x (length of the longest animal)^2.
- Three or more animals in the same enclosure require the minimum space for two animals and, in addition, enough space for the animals to lay separately with at least one body length from one another, to turn around completely, and to move at least two body lengths in one direction.
- The facility must have a plan to manage adult males.
- Animals may be temporarily housed in smaller areas at the discretion of the veterinarian. The attending veterinarian should determine the minimum space which will be most appropriate for the age or medical condition of the animal.
- Critical care animals and young pups may be temporarily supplied smaller pools and less dry resting area.

RECOMMENDED

- One to two animals: 2 x (length of longest animal)^2
- Three or more animals in the same enclosure: (length of each animal)^2 x number of animals in enclosure = number of square feet of required dry resting area (DRA).

2.1.3 Pool or Pen Design

New rehabilitation pools should be designed and constructed to minimize introduction of anthropogenic noise from life-support equipment or other sources. This can be accomplished through sloping of walls, insulation with soil or other materials around the sides of the pool and/or through isolation of noise-generating equipment. A special exception may be granted by NMFS if existing pools do not meet these specifications and a retrofit is not feasible as long as animal welfare is maintained.

MINIMUM STANDARD

- Pools or pens shall be designed for ease of cleaning and handling the animals.

- Open water pens shall optimally be constructed of plastic or other rigid netting.
- If cotton or nylon netting material is used it must be small enough gage to prevent entanglement.

RECOMMENDED

- Pools designed to promote good water circulation and to minimize anthropogenic noise.
- Ability to drop a pool in less than 2 hours and refill it to a "swimming level" in less than 30 minutes or a false bottom or other method utilized for ease of capturing and treating pinnipeds.

2.1.4 Length of Stay and How it Affects Space

Facilities which handle adult animals that are kept for periods longer than six months but less than one year should meet USDA APHIS AWA standards. However the actual length of each animal may be used for each DRA calculation rather than the adult length. After one year, holding space must meet APHIS standards.

2.1.5 Shelter, Shading, and Lighting

Animals housed at rehabilitation facilities must be provided with shelter to provide refuge from extreme heat or cold. Pinnipeds held in rehabilitation facilities may not have normal activity levels and thin animals may be unable to thermoregulate properly. These animals may require shade structures to protect them from direct sunlight and extreme heat, or shelter to protect them from cold temperatures or inclement weather. Animals held in indoor facilities should be provided with appropriate light and dark photoperiods which mimic actual seasonal conditions. At the discretion of the attending veterinarian an exception to refuge from extreme cold during the pre-release conditioning phase may be made. Pinnipeds should be protected at all times from extreme heat.

MINIMUM STANDARD

- Provide shade structures or shelters to animals to aid thermoregulation when local climatic conditions could compromise the health of the animal.
- Provide shade and/or water spray to all pinnipeds that cannot swim and are housed in areas where ambient air temperatures reach > 80° F (26.6° C).
- Lighting in indoor facilities shall be appropriate for the species and shall clearly illuminate the DRA and pool during daylight hours.

RECOMMENDED

- All of the above and a source of natural or full spectrum light for animals housed indoors.
- Removable or adjustable shade structures that may be sanitized regularly in pens to provide more natural sunlight to animals that are swimming and diving normally.

2.1.6 Air Temperature

MINIMUM STANDARD

- Attention to ambient air temperature and humidity should be considered to facilitate recovery, protect rehabilitating animals from extremes of heat or cold, and to prevent discomfort.
- Method to raise or lower air temperature, as appropriate to maintain proper body temperature should be available. Access to full shade, constant water sprays and fans may be used for animals that have no access to pools during times when the ambient temperature exceeds 85°F (29.4°C). Likewise radiant heating devices or waterproof heating pads may be utilized when ambient temperatures fall below the comfort level of the animal, which will be determined by the species, age, medical condition, and body condition of the animal.
- Animals should be able to move away from point source heaters. If animals are too debilitated to move, temperature of heaters can not exceed the safe range of 60-80^{o}F at skin surface or animals must be monitored every 2 hours.
- Large fans or "swamp coolers" available to move air across animals with no access to pools when ambient temperatures reach over 85°F (29.4°C).

RECOMMENDED

- Provide temperature-controlled shelter or holding space for critical care animals or pups.
- Monitor temperature of additional heaters such as heating pads infrared heaters and heat lamps.

2.1.7 HOUSING FOR CRITICAL CARE ANIMALS

Debilitated and ill pinnipeds are often sedentary and haul out or float at the surface of a pool for long periods of time. Young pups may be weak and require assistance moving in and out of pools. A shallow area that allows the animal to rest on the bottom with gradually sloping sides or a ramp equipped with a gripping surface to allow ease in entering and exiting the pool are considered optimal.

MINIMUM STANDARD

- Individual dry haul out space or individual enclosures shall be large enough to accommodate the most common species of pinnipeds rehabilitated routinely at the facility.
- Housing for critically ill animals that will provide shelter from the extremes of heat or cold, and will provide heat as appropriate for animals held in cold climates.
- Access to shallow water and/or water spray for all pinnipeds as advised by the attending veterinarian.
- Barriers sufficient to isolate incoming animals until the attending veterinarian determines them to be free from contagious disease (See Section 2.4 Quarantine).

RECOMMENDED

All of the above minimum standards, plus:

- Individual enclosures for each critical care animal where the dry resting area = (length of the animal)^2.
- Housing which provides optimal temperature control for critically ill animals (heating and/or air conditioning).

2.1.7 Housing of Pups

Pups of all species have special housing and management needs and require careful monitoring when introducing them to pools. Premature pups may require more time than full-term pups before introducing them to water.

MINIMUM STANDARD

Phocids less than 1 week old:

- Individual housing with fully supervised access to shallow water (< 0.5 meters deep) pools. Full supervision may stop when animals demonstrate ability to swim and haul out.

Otariids less than 3 weeks old:

- Individual housing or housing with similarly sized pups with fully supervised access to shallow water pools (<0.5 meters deep) Full supervision may stop when animals demonstrate ability to swim and haul out.

- Access to raised platforms in dry resting areas for pups of all ages at the discretion of the veterinarian. Critical or debilitated pups should not be required to lay on concrete or other hard/cold surfaces. Platforms must be low enough for easy access yet high enough to allow the floor to dry under platform. Platforms should be made of material with a sealed cleanable surface and designed to allow for waste to pass through.

RECOMMENDED

- All of the above and with pools designed with a gently sloping side/beach area with "gripping surface" to allow pups to easily haul out without assistance.

2.1.8 Housing of Older Pups

Full term phocids greater than 1 week old and otariids greater than three weeks old

MINIMUM STANDARD

- House pups with similar conspecific age group.
- House pups as individuals or groups with frequent or constant access to deeper water (> 0.5 meters deep).
- Provide a platform or shallow shelf in each pool that allows pups to easily haul out on their own.
- Provide platforms in dry resting areas allowing critical or debilitated pups an alternative to laying on concrete or other hard/cold surfaces (as above).

RECOMMENDED

- Provide a pool designed with a gently sloping side leading to a level beach area that allows pups to easily haul out.

2.1.9 Number of Animals Housed in Each Pen/Pool

During UME strandings, the number of pinnipeds received by the facility is limited not only by the number and size of the holding pools or pens, but the number of qualified trained rehabilitation staff members available to care for the animals. The maximum number of animals maintained in each pool and onsite at the facility shall be determined by the attending veterinarian and dictated by the number of qualified staff available to care for the animals.

MINIMUM STANDARD

- Provide a minimum of three qualified trained rehabilitation staff members on site for the first 25 pinnipeds housed at the facility, and two more trained rehabilitation staff members for every additional 25 pinnipeds. More staff will be required when animals are housed simultaneously in quarantine holding and recovering animal holding areas. Dependant pups are more labor intensive and require more staffing. Staff must be available on a 24-hour basis for critical animal care.

2.1.10 Housekeeping

MINIMUM STANDARD

- Keep support buildings and grounds as well as areas surrounding rehabilitation pools clean and in good repair.
- Maintain perimeter fences in good repair, and ensure they are an adequate height and construction to keep people and animals and pests out.
- Ensure primary enclosures housing marine mammals do not have any loose objects, sharp projections, and/or edges which may cause injury or trauma to the marine mammals contained therein.
- No holes or gaps larger than ½ the size of the head diameter of the pup of the smallest species to be housed.
- All drains and overflows must have screened covers.
- Objects introduced as environmental enrichment must be too large to swallow and made of non porous cleanable material.

RECOMMENDED

- Coat all pool and haul-out surfaces with a non-porous, non-toxic, non-degradable cleanable material that is able to be disinfected.

2.1.11 Pest Control

MINIMUM STANDARD

- Establish and maintain a safe and effective program for the control of insects, avian and mammalian pests. This should include physical barriers to help to prevent feral and/or wild animals from contact with the rehabilitating animals.

- Insecticides or other such chemical agents shall not be applied in a primary enclosure housing marine mammals or a food preparation area except as authorized in writing by the attending veterinarian.
- If applied, all appropriate measures must be taken to prevent direct contact with the insecticide/pesticide, whether airborne or waterborne, by the animal.

2.1.12 Security for Facility

Stranded marine mammals often attract public attention and must be protected from excessive commotion and public contact. Ensuring a quiet stress-free environment for rehabilitating animals may improve their chance to recover and survive. Public viewing of marine mammals is discussed in Section 2.13 of this document.

MINIMUM STANDARD

- Locate rehabilitation facilities at sites that are able to be secured from the public.
- Prevent direct public contact with the rehabilitating animals by utilizing appropriate fencing, staff and security personnel.

RECOMMENDED

- Maintain 24- hour monitoring when animals are present or maintain a secure perimeter fence with the ability to lock the area off to the public when staff is not present.

2.2 Water Quality

There are four basic types of water systems:

- Pools with filtration systems (closed systems)
- Pools without filtration systems (dump and fill systems)
- Pools with periodic influx of natural seawater (semi-open systems)
- Open water systems (Bay or sea pens).

There are a number of variables which will affect water quality. The number and size of pinnipeds utilizing each pool will vary throughout the year at most rehabilitation institutions. During the busy season or during unusual stranding events, the number of pinnipeds utilizing one pool may increase dramatically creating a heavier load of waste which must be handled by the filtration system in closed systems and by the amount of water flow-through in semi-open and open systems. A life support

system is used as one tool in a program of water quality maintenance to provide safe and clean water to the animals.

Filtration or life support systems are essential to maintaining clean water for animals held in closed or semi-closed systems. Life support systems have three basic parts; mechanical filters that remove solids, biological filters or baffles to remove or detoxify chemicals in the water, and disinfecting methods to control or remove pathogens. In addition to maintaining clean water in the animal pools, these systems may be needed to treat waste water, depending on waste water disposal requirements. If a temporary increase in waste production overwhelms part or all of the life support system, a good water quality control program will require alternative options.

Water used in closed systems generally is fresh water obtained from municipal sources, whereas water in open and semi-open systems comes from a bay or sea source. Water in closed systems must be regularly filtered through sand and gravel filters to remove particulate matter, and disinfectants such as chlorine or bromine may be added to eliminate pathogens. More elaborate systems utilize ozone to oxidize pathogens in the water. The source should be independent of other rehabilitation and captive animal areas.

Factors that affect water quality are:

- Size of pool or pen
- Efficiency of filtration system or water flow-through rate (tides)
- Water turnover rate
- Number, size and species of animals housed in pool or pen
- Type and amount of food consumed by animals in pool or pen
- Nature of bottom substrate
- Frequency of cleaning the pool
- Types, amounts, method and the frequency with which chemicals are added to the system
- Temperature of the water
- Pathogens in the water
- Biotoxins in open water pens or in pools where the source water comes from the ocean or bay
- Contaminants (oil, pesticides, etc.) in open water pens
- Hazardous waste spills
- Inclement weather
- Sunlight contributing to algae production on pool surfaces, which in turn can support bacteria.

2.2.1 Water Source and Disposal

The water source for pinnipeds housed in closed or semi-closed systems may be municipal water, well water, or water brought into the facility from an adjacent body of water or estuary. The source should be independent of other rehabilitation and captive animal areas.

MINIMUM STANDARD

- Fresh or salt water must be readily available to fill pools, and fresh water to clean and wash down holding pens daily.
- Drain water as often as necessary to keep the pool water quality within acceptable limits.
- Discharge waste water in accordance with state or local regulations. Facility managers must seek appropriate authorization to dispose of waste water. Documents of authorization or necessary permits must be kept on site as part of the administrative record and may be requested by NMFS as part of the NMFS Stranding Agreement.
- Chemicals, when necessary, shall be added in appropriate amounts to disinfect the water or adjust the pH, but not added in a manner that could cause harm or discomfort to the animals.
- Have contingency protocols describing how water quality will be maintained during periods of peak animal use.
- Water will be clear enough to see animals and bottom of pool and free from obvious solid waste and noxious odors.

RECOMMENDED

- Fresh or ideally salt water must be available to fill pools within two hours of draining.
- Maintain a filtration system designed to optimize water quality in each holding pool and decrease water waste.
- Ability to dechlorinate fresh water for species which require this (i.e., fur seals).
- Protocols in place for maintenance of water quality throughout the year.
- Testing of source and discharge water.

2.3 Water Quality Testing

It is important to test the water in which the animals live on a regular basis. Coliform bacterial counts are used to monitor the efficiency of the filtration system to eliminate potentially harmful bacteria. Coliform counts should be done at least once per week and more frequently if there are very large or multiple animals utilizing the pool. While coliform numbers may be described as Most Probable

Number (MPN) per 100 ml, a more accurate method of measuring coliforms is to determine the total coliform count, or the fecal coliform count.

Temperature of the water is especially important if the animal lacks the ability to thermoregulate. Water may require heating or chilling to aid debilitated animals in their ability to maintain optimal body temperature, although debilitated pinnipeds are likely to haul out, in such case the water temperature becomes less important. Water temperature regulation is not feasible in open water pens, but keeping track of the water temperature in sea pens may aid the staff in making husbandry decisions. If coliform numbers or the water temperature becomes too high in any system, measures must be taken to correct the problem in a timely manner. A partial-to-total water change may be necessary to correct the problem in a closed or semi-closed system. If the coliform counts are considered too high in sea or bay pens, efforts should be made to circulate clean sea water through the pens using pumps, paddles or other methods of moving water.

Chemicals added to the water may damage eyes and skin and must be monitored daily. Salinity, when utilized for rehabilitating pinnipeds, may also have an impact on the health of the skin and eyes, as well as the comfort level of the animal, and should be monitored regularly. Emergency chemicals should be on hand such as sodium thiosulfate in case of the accidental hyperchlorination of a system.

2.3.1 Water Quality Tests

MINIMUM STANDARD

- Measure coliform growth weekly, unless pools are dumped and filled daily.
- Total coliform counts must not exceed 500 per 100 ml or a MPN of 1000 coliform bacteria per 100 ml water. Fecal coliform counts are not to exceed 400 per 100 ml.
- If the above tests yield results that exceed the allowable bacterial count, then two subsequent samples must be taken to repeat the test(s) where the level(s) is/are exceeded. The second sample is to be taken immediately after the initial test result, while the third sample would be taken within 48 hours of the initial test.
- If the averaged value of the three test results still exceeds the allowable bacterial counts, the condition must be corrected immediately or the animals moved to a contingency facility.
- Maintain pH between 6.5 and 8.5.
- Maintain the temperature of the water so that it falls within parameters appropriate for the species, generally between 50-80^{o}F.

- Measure oxidant levels in systems which require use of a chemical disinfectant and/or ozone in the system (for closed systems).

RECOMMENDED

- Maintain pH between 7.2 to 8.2.
- Total Coliforms with blanks and controls, fecal Coliform, fecal Strep, and yeast count performed weekly or as needed.

2.3.2 Frequency of Testing in Closed, Semi-open, or Open Systems

MINIMUM STANDARD

- Measure water temperature, pH, salinity (if applicable), chemical additives (if applicable) daily in all pools.
- Measure coliform counts weekly; and more frequently at the discretion of the attending veterinarian.

RECOMMENDED

- If ozone systems are used, measure ozone levels regularly in the animal pools. Ozone levels shall not exceed 0.02 mg/liter.
- Test source and discharge water at least once per day (more frequently for "flow through" systems).
- Maintain records for tests with time, level and results – reviewed and signed monthly by the attending veterinarian or animal care supervisor.

2.3.3 Chemical Additives

Total chlorine = Free chlorine + combined chlorine.

MINIMUM STANDARD

- Maintain total chlorine below 1.5 ppm, where the combined chlorine shall not exceed 50% of the total chlorine.
- All additives must be recorded.
- pH may be adjusted chemically – for example – pH may be raised with sodium carbonate, or soda ash; or lowered with HCl or CO2; but not added in a manner that could cause harm or discomfort to the animals.

- Maintain MSDS information and signage as well as appropriate handling equipment for the addition of chemicals.

2.3.4 Water Circulation

The amount of water turnover through the filtration system in a closed or semi-open system is important to maintain water quality by removing organic waste and particulate matter. Likewise the amount of water movement through an open water pen is also important in the maintenance of water quality. Generally, adequate tidal action will result in the equivalent of two complete water changes per day.

MINIMUM STANDARD

- Maintain sufficient turnover of water through the filtration system in closed or semi-open systems to keep the water quality at or above acceptable limits, with a minimum of two complete water changes per day.
- Ensure methods for moving water (water paddles, pumps, spray devices) are available to aerate and move water in open water pens with insufficient flow of tides or water through the enclosures. These methods should be sufficient to provide the equivalent of two water changes per day.

RECOMMENDED

- A minimum full water turnover rate of every four hours for each pool in closed or semi-open systems.

2.3.5 Salinity

Pinnipeds under rehabilitation may be housed in fresh water. However salinity may play a part in eye health, may enhance wound healing, or may be desirable in some other instances. In some cases animals will drink fresh water which may aid in rehydration. Placing animals in water of appropriate salinity shall be left to the discretion of the animal care supervisor and staff in consultation with the attending veterinarian.

2.3.6 pH

MINIMUM STANDARD

- pH shall be held in a range between 6.5 to 8.5.

RECOMMENDED

- Maintain pH between 7.2 to 8.2.

2.3.7 Water Temperature

MINIMUM STANDARD

- Hold water temperatures within the normal habitat temperature range for the species under rehabilitation or as authorized in writing by the attending veterinarian.
- Provide methods to heat and maintain warm water environments for species that require it, or for debilitated or critically ill individuals that are incapable of maintaining appropriate body temperature.
- Monitor temperature of water being heated or cooled.

2.4 Quarantine

Pinnipeds brought to a rehabilitation facility have no medical history and may carry diseases communicable to other marine mammals, other animals, or humans. Likewise, these animals are often debilitated and may suffer from a variety of illnesses which may compromise their immune systems making them susceptible to diseases from other animals. Quarantine areas must be available and proper biosecurity protocols must be in place for all incoming animals at rehabilitation facilities.

Direct contact between the general public and pinnipeds undergoing rehabilitation should be avoided because of the zoonotic risk of some organisms carried by marine mammals. There have been documented cases of Brucella, Leptospira, Mycoplasma (Seal Finger), San Miguel Sea Lion Virus, Influenza A, and Sealpox, being passed from pinnipeds to humans.

Listed on the following website are numerous other potentially zoonotic marine mammal pathogens (see *http://www.vetmed.ucdavis.edu/whc/mmz/*). See also: *2004 UC Davis Wildlife Health Center Report for the Marine Mammal Commission – Assessment of the Risk of Zoonotic Disease Transmission to Marine Mammal Workers and the Public: Survey of Occupational Risks.*

2.4.1 Prevention of Animal to Animal Transmission of Diseases

MINIMUM STANDARD

- Quarantine all new animals in a separate dedicated quarantine area and provide pens/pools that can be isolated with the use of dividers, tarps, or physical space from the rest of the animal housing areas. Animals that are admitted in groups may be quarantined together.
- Provide dividers between pens and pools that prevent washdown or splash from moving from one pool or pen to another.
- Use dedicated protective clothing for personnel- including gloves, eye shields, safety glasses, and/or eye wash stations.
- Use foot baths, glove baths, and methods to disinfect clothing between handling animals within quarantine area and outside of quarantine area.
- Maintain equipment and tools strictly dedicated to the quarantine area or thoroughly disinfect.
- Provide sufficient space or solid-surfaced barriers between animal enclosures to prevent direct contact between animals.
- Provide sufficient air turnover in indoor facilities to prevent transmission of disease. Air turnover should be enough to prevent build-up of heat and provide a method of bringing fresh air into the facility. There should be sufficient venting or openings to allow movement of air throughout the facility.
- Implement specific quarantine and sanitation procedures to prevent transmission of disease through fomites (e.g., clothing, equipment):
    - Thoroughly clean and disinfect buckets, hoses, scales, transport equipment, and cleaning equipment that is moved between animal areas to prevent transmission of pathogens via fomites.
- Place open water pens so effluent is not near water intake.
- Require evaluation and written veterinary approval before placing animals together after quarantine period has been met.

RECOMMENDED

- Provide separate air handling system in indoor facilities.
- Separate entries to quarantine areas with no crossover with the rest of the facility.
- Clean and disinfect quarantine areas between uses.

2.4.2 Prevention of Domestic Animal to Marine Mammal Transmission of Disease

- Ensure appropriate fencing and placement of holding pens to prevent direct contact between rehabilitating pinnipeds and domestic animals.
- Prohibit personal pets within outermost perimeter of facility.
- Require that specific quarantine and sanitation procedures are taken to prevent transmission of disease through fomites such as clothing and equipment.
- Use dedicated carriers for pinnipeds – carriers should not be used for other mammals or birds unless they are thoroughly scrubbed and disinfected between uses.

2.4.3 Prevention of Wild Animal to Marine Mammal Transmission of Disease

- Ensure perimeter fencing will deter wildlife from entering the rehabilitation premises.
- Provide rodent control on the premises.
- Ensure net pens and lagoon areas have sufficient secondary fencing to keep wild mammals from coming in direct contact with the animals housed in the net pens.

2.4.4 Prevention of Marine Mammal to Domestic Animal Transmission of Disease

- Provide appropriate perimeter fencing.
- Require animal personnel to change contaminated clothing and/or disinfect before leaving the rehabilitation premises.
- Require that specific quarantine and sanitation procedures are taken to prevent transmission of disease through fomites such as clothing and equipment.
- Follow appropriate release guidelines.

2.4.5 Prevention of Stranded Marine Mammal to Captive Marine Mammal Transmission of Disease

- Train volunteers and staff to follow appropriate quarantine protocols.
- Establish quarantine protocols that take into consideration the changing status of the stranded animal.
- Establish traffic flow so that volunteers or staff working with stranded animals do not inadvertently travel into a collection animal area.

- Establish decontamination protocols before volunteers or staff members exposed to stranded animals may enter a collection animal area.
- Establish separate restrooms, showers, changing rooms, food preparation areas, etc. for staff and volunteers working with rehabilitating vs. collection animals. Food for rehabilitating animals may be prepared in the collection animal kitchen and taken to the rehabilitation animal area, however any bucket, feed implement or other item must be thoroughly disinfected before it may return to the collection animal area.

2.4.6 Methods to Reduce Spread of Disease from Animals Housed in Open Sea/Bay Pen Systems

- Place pens in a secluded area where wild animals and marine mammals are unlikely to come into direct contact with the animals housed in the sea/bay pens.
- Place a second set of perimeter nets 30 feet from the sea/bay pens to prevent direct contact with wild marine mammals. Nets should be sufficiently rigid to prevent entanglement by mammals or fish.
- Do not place sea/bay pens within 1000 meters any major outflow sewage treatment plants and consider the flow direction or current from these major outflows.
- Place the sea/bay pens 500 meters and downstream from water intake pipes that bring water into facilities that house marine mammals.
- Place pens in an area where there is ample flow-through of tides/currents.
- Ensure the pens are of sufficient size to minimize biomatter build-up. Each pinniped should be housed in a pen that has a minimum depth of half of their body length, and a minimum horizontal dimension of two full body lengths.
- Avoid overcrowded pens. Animals may fight with each other when housed too closely together.
- Have equipment to pump or aerate the water in pens that do not have sufficient tidal action to ensure a minimum of two complete water changes per day.
- Place pens in areas where there is sufficient depth to enhance water circulation and reduce pathogen build-up. Weekly coliform testing will determine if pathogen build-up exists. Water circulation may be enhanced using water paddles.
- Place quarantine pens such that tidal action or underwater currents will not flow from quarantine pens through sea pens housing healthy animals.

2.4.7 Evaluation Requirements before Placing Marine Mammals Together

- CBC/Chemistries, appropriate cultures, physical examination before moving animals out of quarantine area and at the discretion of the attending veterinarian.
- Review current NMFS recommendations on diseases of concern and reportable disease such as morbillivirus.
- Consider screening for morbillivirus, herpes virus, brucellosis, leptospirosis, and toxoplasmosis utilizing the most current diagnostic tests available and at the discretion of the attending veterinarian.
- If animals are part of a UME, then screening for diseases must be more thorough and in direct coordination with NMFS and the UME On-site Coordinators.
- Have contingency plan for animals that are actively infected with or carriers of a reportable disease such as brucellosis, leptospirosis, toxoplasmosis, herpes virus, and morbillivirus.

2.4.8 Zoonotic Considerations

- Restrict public access and direct contact with pinnipeds due to zoonosis potential and public health hazard of untrained individuals interacting with sick and injured marine mammals.
- Train staff and personnel about how to prevent contracting zoonotic diseases (*Occupational and Safety Information for Marine Mammal Workers* http://www.vetmed.ucdavis.edu/whc/mmz/).
- Train staff and personnel working directly with stranded pinnipeds how to recognize symptoms of zoonotic disease.
- Train staff the basics of sanitation and properly handling contaminated equipment.
- Provide appropriate safety equipment, as reasonable, such as protective clothing, eye protection and face masks to all staff who may be exposed to zoonotic diseases.
- Provide eye flushing stations as used with HAZMAT or normal saline bottles to irrigate the eyes.
- Staff with open wounds shall not handle animals carrying potentially infectious diseases without appropriate precautions to protect their wound(s).

2.4.9 Pre-Release Guidelines

- Pre-release health screens and serologic requirements are determined by the NMFS Regional Stranding Coordinator and the Marine Mammal Health and Stranding Response Program (see *NMFS/FWS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release*).

2.5 Sanitation

2.5.1 Primary Enclosure Sanitation

MINIMUM STANDARD

- Remove animal and food waste in areas other than the rehabilitation pool from the rehabilitation enclosure at least daily, and more often when necessary to prevent contamination of the marine mammals contained therein and to minimize disease hazards.
- Remove particulate animal and food waste, trash, or debris that enter rehabilitation/exercise pens or pools at least once daily, but as often as necessary to maintain water quality and to prevent increased health hazards to the marine mammals that use the pools.
- Remove trash and debris from pools as soon as it is noticed, to preclude ingestion or other harm to the animals.
- Clean the walls and bottom surfaces of the rehabilitation/exercise pens and pools as often as necessary to maintain a clean environment and proper water quality.
- Ensure appropriate disinfectants mixed to recommended dilutions are utilized to clean pens, equipment, utensils, and feed receptacles and to place in foot baths. These disinfectants should have both bacteriocidal and virocidal qualities.
- Rotate disinfectants on a regular basis to prevent bacterial resistance.
- Prevent animals from coming in direct contact with disinfectants or aerosol from spray or cleaning hoses (i.e., water splashed from floor).

RECOMMENDED

- Empty and allow pools to dry once each year but dry and hyperchlorinate pool bottoms and walls and haul-out areas after each use by sick pinnipeds.

2.5.2 Sanitation of Food Preparation Areas and Food Receptacles

- Use separate food preparation areas and supplies for rehabilitation vs. collection animals.
- Clean food containers such as buckets, tubs, and tanks, as well as utensils, such as knives and cutting boards, or any other equipment which has been used for holding, thawing or preparing food for marine mammals after each feeding, and sanitize at least once a day. Equipment should be cleaned with detergent and hot water, sanitized and dried before reuse.
- Clean kitchens and other food handling areas where animal food is prepared after every use, and sanitize at least once weekly using standard accepted sanitation practices.

- Store substances such as cleaning and sanitizing agents, pesticides and other potentially toxic agents in properly labeled containers away from food preparation areas.
- Post MSDS "right to know" documents for staff utilizing cleaning and animal treatment chemicals and drugs.

2.6 Food, Handling, and Preparation

During rehabilitation food for marine mammals shall be wholesome, palatable, free from contamination, and of sufficient quantity and nutritive value to allow the recovery of the animals to a state of good health. Live fish may be fed during rehabilitation but preferences should be given to native prey species. Live fish may contain parasites which could infect compromised animals. Feeding regimens should be tailored to enhance weight gain for underweight animals or growing pups, and should simulate natural patterns in terms of frequency and quantity to the extent possible while following a prescribed course of medical treatment. Most pinnipeds feed several times during a given day

2.6.1 Diets and Food Preparation

MINIMUM STANDARD

- Prepare the diets with consideration for age, species, condition, and size of marine mammals being fed.
- Feed pinnipeds a minimum of twice a day, except as directed by a qualified veterinarian or when following professionally accepted practices.
- Diets reviewed by a nutritionist, attending veterinarian, or the animal care supervisor.
- Train staff to recognize good and bad fish quality.
- Feeding live fish may be required for release determination. See *NMFS /FWS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release* for more information regarding feeding live fish.
- Food receptacles should be cleaned and sanitized after each use. Food preparation and handling should be conducted so as to minimize bacterial or chemical contamination and to ensure the wholesomeness and nutritive value of the food.

2.6.2 Food Storage and Thawing

- Frozen fish or other frozen food shall be stored in freezers which are maintained at a maximum temperature of 0^{o} F (-18^{o} C).

- The length of time food is stored and the method of storage, as well as the thawing of frozen food should be conducted in a manner which will minimize contamination and which will assure that the food retains optimal nutritive value and wholesome quality until the time of feeding.
- Freezers should only contain fish for animal consumption. Human food or specimens should not be placed in the fish freezer.
- Experienced staff should inspect fish upon arrival to ensure there are no signs of previous thawing and re-freezing, and check temperature monitoring devices in the transport container. The fish shipment should be refused, or fish should be discarded if temperature fluctuations occurred during transport.
- Freezers shall be of sufficient size to allow for proper stock rotation.
- All foods shall be fed to the marine mammals within 24 hours following the removal of such foods from the freezers for thawing.
- If the food has been thawed under refrigeration it must be fed to marine mammals within 12 hours of complete thawing.
- When fish is thawed in standing or running water, the coldest available running water must be used to prevent excess bacterial growth.
- To ensure optimal quality of the fish, and to prevent bacterial overgrowth, do not allow fish to reach room temperature or sit in direct sunlight.
- The thawed fish shall be kept iced or refrigerated until a reasonable time before feeding. This time will vary with ambient temperature.
- Prepared formula should be fed immediately or refrigerated and fed to the marine mammals within 24 hours of preparation. Formula, once heated to an appropriate temperature for a feed, shall be discarded if it is not consumed within one hour.

RECOMMENDED

- Calculate kilocalories of each type of fish or food items fed to each animal daily.
- Conduct food analysis for protein, fat and water content of each lot of fish used. Analysis from fish supplier may be used, and a copy should be maintained on site.
- Calculate composition of each diet routinely used.

2.6.3 Supplements

MINIMUM STANDARD

- Each animal shall receive appropriate vitamin supplementation which is sufficient and approved in writing by the attending veterinarian.
- Salt supplements shall be given to pinnipeds housed in fresh water as necessary and as approved by the attending veterinarian.

2.6.4 Feeding

Food, when given to each marine mammal individually or in groups, must be given by an employee or trained personnel who has the necessary training and knowledge to assure that each marine mammal receives an adequate quantity of food to maximize its recovery or maintain good health. Such personnel are required to recognize deviations in each animal being rehabilitated such that food intake can be adjusted accordingly.

2.6.5 Public Feeding

MINIMUM STANDARD

- Public feeding is not allowed for animals that are being rehabilitated.
- Feeding must be conducted only by qualified, trained rehabilitation staff members.

2.6.6 Feed Records

MINIMUM STANDARD

- Maintain feed records for each individual animal noting the individual (not an estimate) daily consumption by specific food type.
- If animals are fed in groups then group feed records shall be maintained and together with daily husbandry notes and weekly weight records ensure evidence of sufficient feed intake.
- Weigh food before and after each feeding individuals and groups and the record the amount consumed.
- Weigh the animal as practical, keeping in mind that obtaining the weight of the animal may stressful.
- If weighing the animal is not an option, obtain the girth measurement at the level of the axilla if possible.

2.7 Veterinary Medical Care

All rehabilitation facilities shall have an attending veterinarian. The attending veterinarian is critically involved in making decisions regarding medical care as well as housing and husbandry of resident and newly admitted patients.

2.7.1 Veterinary Experience

MINIMUM STANDARD

The attending veterinarian shall:

- Assume responsibility for diagnosis, treatment, and medical clearance for release or transport of marine mammals in rehabilitation (50 CFR 216.27).
- Ability to provide a schedule of veterinary care that includes a review of husbandry records, visual and physical examinations of all the marine mammals in rehabilitation, and a periodic visual inspection of the facilities and records.
- Be available to examine animals on a regular schedule and emergency basis.
- Be available to answer veterinary questions on a 24 hour basis.
- Have marine mammal experience or be in regular consultation with a veterinarian who has marine mammal experience and have access to a list of expert veterinarians to contact for assistance.
- Have an active veterinary license in the United States (means a person who has graduated from a veterinary school accredited by the American Veterinary Medical Association Council on Education, or has a certificate issued by the American Veterinary Graduates Association's Education Commission for Foreign Veterinary Graduates), or has received equivalent formal education as determined by NMFS Administrator (adapted from the Animal Welfare Act Regulations 9 CFR Ch. 1).
- Have the skills to be able to draw blood and give injections to the species most commonly encountered at the rehabilitation center.
- Facility management should have contingency plan for veterinary backup.
- Have the appropriate registrations and licenses (e.g., registered with the Drug Enforcement Administration for handling controlled substances) to obtain the necessary medications for the animals housed at that rehabilitation facility.
- Be able to conduct a full post-mortem exam on all species of pinnipeds treated at the facility.
- Be knowledgeable and able to perform pinniped euthanasia.

- Be knowledgeable about species-specific pharmacology.
- Must certify in writing that animals are fit for transport.
- Ability to write and submit timely disposition recommendations for marine mammals in rehabilitation.
- Be knowledgeable of marine mammal zoonotic diseases.

RECOMMENDED

All of the above plus:

- Membership in the International Association for Aquatic Animal Medicine.
- Complete a course which offers basic medical training with marine mammals such as Seavet, Aquavet, or MARVET.
- Have at least one year of clinical experience outside of veterinary school.
- Have access to a current version of the "Handbook of Marine Mammal Medicine" Have basic hands-on veterinary experience with the species most frequently rehabilitated at the facility.
- Be full time employee or the contract veterinarian of record at facilities managing over 50 pinniped cases per year (i.e., live and dead).

2.7.2 Veterinary Program

MINIMUM STANDARD

- Veterinary care for the animals must conform with any State Veterinary Practice Act or other laws governing veterinary medicine which applies to the state in which the facility is located.
- Standard operating procedures should be reviewed and initialed by the attending veterinarian or the animal care supervisor annually and/or whenever the document is changed or updated. This document may be reviewed by NMFS as part of the NMFS Stranding Agreement or as part of inspections.
- Staff caring for animals should be sufficiently trained to assist with veterinary procedures under the direction of the veterinarian and the rehabilitation facility should maintain at least one **Animal Care Supervisor** who is responsible for overseeing prescribed treatments, maintaining hospital equipment, and controlling drug supplies. The person should be adequately trained to deal with emergencies until the veterinarian arrives, be able to direct the restraint of the animals, be responsible for administration of post-surgical care, and be skilled in maintaining appropriate medical records. It is important that the animal care supervisor should communicate frequently

and directly with the attending veterinarian to ensure that there is a timely transfer of accurate information about medical issues.

- Veterinary decisions shall be based on "best practices" (i.e., based on informed opinions and expertise of veterinarians practicing marine mammal medicine).
- A schedule of veterinary care which includes a review of husbandry records, visual and physical examinations of the animals, and a visual inspection of the facilities should be implemented
- A health and safety plan for the staff shall be written and accessible at all times. It shall be reviewed by the attending veterinarian or the animal care supervisor annually or as prescribed by the NMFS Stranding Agreement. Also, it may be beneficial to consult with an occupational health medical professional when developing these plans. All animal care staff will be familiar with the plan. The plan shall include protocols for managing bite wounds.

The following reports may be requested annually by NMFS as required under the NMFS Stranding Agreement or as a part of inspections

- SOP reviews
- Health and Safety Plan reviews
- Animal acquisitions and dispositions
- NOAA Form 89864, OMB#0648-0178 (Level A data)
- NOAA Form 89878, OMB#0648-0178 (Marine Mammal Rehabilitation Disposition Report)
- Case summaries for any rehabilitation performed at a facility, including narrative descriptions of the cases as well as spreadsheets of treatments, blood values, etc.

2.8 Laboratory Tests and Frequency of Testing

Specific requirements for tests will be issued by the NMFS stranding coordinator (or UME Onsite Coordinator) in each region as outlined in the Marine Mammal Health and Stranding Response Program for release determinations, surveillance programs and UME investigations. Routine diagnostic sampling and testing protocols will be determined by the attending veterinarian. NMFS must be provided adequate time and information including a veterinary certificate of health before an animal is released as directed in 50 CFR 216.27 (see NMFS/FWS BEST PRACTICES for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release).

MINIMUM LABORATORY TESTING

- CBC/Serum Chemistry- For most cases, all animals shall have a minimum of two blood samples drawn for CBC with differential and serum chemistry; upon admission and prior to release (see *NMFS/FWS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release*). If duration of rehabilitation is shorter than a week, one blood workup may suffice and is at the attending veterinarian's discretion.
- Fecal analysis for parasites- Fecal tests for parasites shall be run upon admission of each animal at the discretion of the attending veterinarian.
- Serology as necessary for release determination based on direction of the NMFS stranding coordinator and the Marine Mammal Health and Stranding Program each year and for additional clinical diagnosis as deemed appropriate by the attending veterinarian.
- If serology is positive for pathogens of concern NMFS must give final sign off before animal is released.
- Measure body weight, and length upon admission, and within one week of release/placement. Measure girth when possible, or whenever a scale is not available to measure weight.
- The attending veterinarian or a trained staff member shall perform a necropsy on every animal that dies within 24 hours of death if feasible. If necropsy is to be performed at a later date (ideally no longer than 72 hours postmortem), the carcass should be stored appropriately to delay tissue decomposition.
- Carcass disposal shall be handled in a manner consistent with local and state regulations.
- Perform histopathology on select tissues from each animal that dies at the discretion of the attending veterinarian. A complete set of all major tissues should be evaluated if the animal dies of an apparent infectious disease process.
- Culture and other diagnostic sampling shall be conducted as directed by the attending veterinarian to determine the cause of stranding or death.
- Contact NMFS for additional laboratory test requirements in all cases of unusual mortality outbreaks or disease outbreaks. More complete testing may be required for diseases of concern.
- For cases involving release decisions, unusual mortality investigations, or surveillance programs, serologic assays may only go to labs that have validated tests approved by NMFS, especially for release decisions or determinations. Guidance will be provided by the NMFS Stranding Coordinators or UME Onsite Coordinator.
- Notify the NMFS Stranding Coordinator of learning of any diseases of concern (e.g., emerging, reportable, and/or zoonotic diseases) that are detected and/or confirmed that could be a potential

hazard for public health or animal health (NMFS will provide guidance on reportable diseases as it becomes available).

- NMFS must be provided adequate time and information (including veterinary certificate of health) before the animal is released in all cases as directed in 50 CFR 216.27 (see NMFS Standards for Release). This information is required under 50 CFR 216.27(a) and must be submitted 15 days prior to release unless advanced notice is waived by the NMFS Regional Administrator. Guidance on the waivers is provided in the *NMFS/FWS Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release – Standards for Release*.

RECOMMENDED

- CBC/Serum Chemistry with electrolytes on admission, within the week prior to release, and every other week during rehabilitation if restraint for sampling is not detrimental to the health of the animal.
- More frequent blood sampling at the discretion of the veterinarian.
- Weight measured on admission, just before release, and weekly for growing pups and underweight animals.
- Weights should be measured monthly for all animals unless the stress of capturing the animal to weigh it outweighs the benefits of the data.
- Complete necropsy performed by a veterinarian or a pathologist within 24 hours of death.
- Full histopathology done on tissues from each animal that dies of apparent infectious disease.
- Bank 1cc of serum per blood draw in –80^{o}F freezer.

2.9 Record Keeping and Data Collection

Record keeping is an essential part of the rehabilitation process. Not only do accurate and complete medical records for each stranded pinniped allow the staff to provide consistent and optimal care for each animal, but retrospective records help scientists and veterinarians make better evaluations on how to treat individuals.

Record Keeping

MINIMUM RECORDS

- Record and report "Level A", and disposition reports as advised by Regional Coordinator and Marine Mammal Rehabilitation Disposition Report (NOAA 89-878, OMB #0648-0178) as in accordance with the NMFS Stranding Agreement.
- Maintain and update individual medical records daily on each animal at the rehabilitation center.
- Individually identify each animal with unique identifier
- Keep an accurate description of the animal, including identification/tag number, date and location of stranding, sex, weight, and length at stranding.
- Subjective, objective, assessment and plan (SOAP) based records are preferred
- Include food intake and medication administered to each animal in the records each day.
- Weight
    a. Recorded weekly for underweight pinnipeds or pups, and more often if the attending veterinarian feels it is necessary to properly care for the animal.
    b. Recorded on admission and release for larger pinnipeds.
- Record all treatments, blood work, test and results and daily observations in the medical records.
- Maintain individual medical records for each animal. Medical records remain on site where the animal is housed and are available for NMFS review upon request as stated in the NMFS Stranding Agreement.
- Hold medical records for a minimum of 15 years on site.
- Maintain up to date water quality records.
- Maintain life support system maintenance records.
- Maintain records of water quality additives.

RECOMMENDED RECORD KEEPING

All of the above plus:

- Full set of standard morphometrics prior to release.
- Photographic documentation of animals with significant lesions, identifying marks.
- Caloric value of daily food intake calculated and recorded for each animal.
- Daily weight of underweight pups. Larger species, where pups exceed 50 kg, may require obtaining weights less frequently.

- Monthly weights of larger pinnipeds (where the stress of capture to weigh does not adversely affect the rehabilitation efforts).
- Maintain food acquisition and analysis records.
- Maintain "paper copy" archive of required NMFS records.

2.9.1 Data Collection

MINIMUM STANDARD

- Written documentation of the medical history, food and observation records must be kept.
- NMFS Required Forms to be completed in writing or submitted electronically in the NMFS National Marine Mammal Stranding Database as prescribed in the NMFS Stranding Agreement:
  a. NOAA Form 89864, OMB#0648-0178 (Level A data)
  b. NOAA Form 89878, OMB#0648-0178 (Marine Mammal Rehabilitation Disposition Report).

RECOMMENDED

- Computerized documentation with hard copies.
- Ability to network with other institutions.
- Maintain real-time accessible compiled comparative data.

2.10 Euthanasia

- Each institution must have a written euthanasia protocol signed by the attending veterinarian.
- Persons administering the euthanasia must be knowledgeable and trained to perform the procedure.
- Maintain a list of individuals authorized to perform euthanasia signed by the veterinarian.
- Euthanasia shall be performed in a way to minimize distress in the animal.
- Refer to resources such as the American Veterinary Medical Association Panel Report on Euthanasia, the CRC Press Handbook of Marine Mammal Medicine and American Association for Zoo Veterinarians Guidelines for Euthanasia of Nondomestic Animals.
- Appropriate drugs for euthanasia in appropriate amounts for the largest species admitted to the facility shall be maintained in stock on site in an appropriate lockbox or under the control of a licensed veterinarian with a current DEA license.
- Drugs for euthanasia shall be kept with an accurate inventory system in place.
- DEA laws and regulations and State Veterinary Practice Acts must be followed when using controlled drugs

- NMFS may request this information (protocols and DEA number) as part of the NMFS Stranding Agreement.

2.11 Health and Safety for Personnel

There shall be a health and safety plan on site at each rehabilitation facility that identifies all health and safety issues that may be factors when working closely with wild marine mammals. The plan should identify all potential zoonotic diseases as well as including safety plans for the direct handling of all species and sizes of pinnipeds seen at that facility. Rehabilitation facilities are encouraged to comply with Occupational Safety and Health Administration regulations.

MINIMUM STANDARD

- Identify all potential zoonotic diseases in a written document available to all personnel.
- Include safety plans for the direct handling of all species and sizes of pinnipeds seen at that facility.
- Include safety plan for dealing with handling any untreated discharge water.

2.12 Contingency Plans

Contingency plans shall be in place at each facility and may be required by NMFS as part of the NMFS Stranding Agreement. NMFS may require approved variances or waivers prior to planned projects such as construction. These plans should address in detail the operation of the facility and care of the animals under the following conditions:

- Inclement weather plan, including a hurricane/big storm plans where appropriate.
- Construction in the vicinity of the animal rehabilitation pens or pools.
- Power outages, including plans of how to maintain frozen fish stores and life support systems.
- Water shortages.
- "Acts of God" plan which may include floods, earthquakes or other unpredictable problems known to occur on occasion in the region where the facility is located.

2.13 Viewing

NMFS Regulation, U.S.C. 50 CFR 216.2(c)(5) states that marine mammals undergoing rehabilitation shall not be subject to public display. The definition of public display under U.S.C. 50 CFR is "an activity that provides opportunity for the public to view living marine mammals at a facility holding

marine mammals captive". Only remote public viewing or distance viewing should be allowed and only when there is no possible impact of the public viewing on the animals being rehabilitated. There is a regulatory requirement for a variance or waiver by NMFS for facilities planning to offer public viewing of any marine mammal undergoing rehabilitation.

2.14 Training and Deconditioning Behaviors

Basic behavioral conditioning of wild pinnipeds for husbandry and medical procedure may be warranted during rehabilitation as long as every effort is made to limit reinforced contact with humans. Such conditioning may reduce stress for the animal during exams and acquisition of biological samples. Conditioning may assist with appetite assessment and ensuring that e each animal in a group receives the appropriate amount and type of diet and medications. In some cases, extensive contact with humans, including training, may benefit resolution of the medical case by providing mental stimulation and behavioral enrichment, and may facilitate medical procedures. The relative costs and benefits of training should be evaluated by the staff veterinarian, and the likelihood of contact with humans following release should be considered.

Behavioral conditioning of pinnipeds must 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. If an animal has become accustomed to hand-feeding the animal may approach humans after release. Therefore, these behaviors should be deconditioned before the animals can be considered for release. Most behaviors will extinguish through lack of reinforcement, but some may require more concentrated efforts.

Training for research that is above and beyond the scope of normal rehabilitation practices can be approved on a case-by case basis under a NMFS scientific research permit. An exception can be made if the attending veterinarian, facility, and NMFS officials all agree that the research will not be detrimental to the animals' health and welfare and will not impede their ability to be successfully released back to the wild.

2.15 References

Langman VA, Rowe M, Forthman D, Whitton B, Langman N, Roberts T, Kuston K, Boling C, and Maloney D. 1996. Thermal Assessment of Zoological Exhibits I: Sea Lion Enclosure at the Audubon Zoo. Zoo Biology 15:403-411.

3. Frequently Asked Questions

Why are there two sets of standards, "minimum" and "recommended", in the facilities guidelines?

The thought behind the two sets of guidelines was to establish a bare minimum standard which every facility should have to meet in order to rehabilitate either pinnipeds or cetaceans. The "recommended" standards are standards considered more ideal to help maximize the success of the rehabilitation effort, and to minimize the potential spread of disease. Many facilities exceed the recommended standard.

Facilities that just meet the minimum standards may wish to improve their facility over time. The Facilities Guidelines could serve as a method of justifying and helping to secure Prescott Funds or other funding to make improvements to bring a facility up to the recommended standards.

Why are there separate standards for pinnipeds and cetaceans?

While many aspects of rehabilitating cetaceans and pinnipeds that are the same, there are likewise many significant differences. Water quality, pool space and design, and handling debilitated animals are examples of the bigger differences between facility design and equipment required for rehabilitation of these animals. Rehabilitation of cetaceans requires more expensive facilities, as there must be larger, deeper pools available, salt water systems, and more elaborate filtration in closed system situations. While some facilities have adequate equipment and personnel to rehabilitate pinnipeds, they may not meet the standards required for the rehabilitation of cetaceans. Having two sets of guidelines allows NMFS the flexibility of issuing agreements specific to the types of animals that may be rehabilitated at each facility.

Many of the standards listed appear to be directly from the AWA standards. Why don't you just state that the facilities will meet all of the AWA regulations? What if the AWA regulations change?

AWA regulations have specific engineering standards to cover captive marine mammals. These standards for pool size and depth are based on captive adult-sized animals. The majority of pinnipeds admitted to most rehabilitation facilities are pups, juveniles, and sub-adults, and because they are not going to be permanent members of a collection, pool size may be smaller than the minimum sizes

stated in the AWA regulations. Cetacean facility guidelines minimum pool sizes are closer to the AWA regulations in pool size, but not identical, as these animals are not considered to be permanent residents.

AWA regulations may change, however these Facilities Guidelines were created with the consideration that animals being rehabilitated are not permanent residents of the facility. Therefore even if AWA regulations change, it is likely, the Stranding Network Facilities Guidelines will remain the same. Facilities Guidelines apply to the wild animals held by participants of the stranding network, whereas the AWA regulations refer to captive animals owned by the licensees.

Under Water Quality, no mention is made regarding protecting staff and public from discharged water.

This is covered by the statement that "All water must be discharged according to State and Local Regulations". Since state and local regulations vary, it is up to each institution to ensure their discharge policy conforms to the regulations in their area. These regulations should take into consideration the public exposure to the discharged water from the rehabilitation facility. Likewise all rehabilitation facilities should have Standard Operating Procedures in place to protect their staff from hazards which may be posed by the rehabilitation of marine mammals.

NOAA
National Marine Fisheries Service
Office of Protected Resources

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

FINAL

POLICIES AND BEST PRACTICES

MARINE MAMMAL STRANDING RESPONSE, REHABILITATION, AND RELEASE

STANDARDS FOR RELEASE

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Standards for Release

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Executive Summary

Rescue, rehabilitation, and release of wild marine mammals is allowed for authorized individuals under listed conditions by the Marine Mammal Protection Act (MMPA) [16 U.S.C. 1379 § 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 §402(a)]. This document fulfills the statutory mandate and is not intended to replace marine mammal laws or regulations.

In accordance with the MMPA, these guidelines were developed by the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (FWS) in consultation with marine mammal experts through review and public comment on the 1997 draft NOAA Technical Memorandum "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 help determine 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 Non-releasable (Manatees only)**, and **Non-releasable**. This document establishes essential release criteria that trained experts should use to determine whether or not individual animals are healthy enough to release into the wild. The essential release criteria are assessed in the following categories:

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 their 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.

1. Introduction

1.1 Background

Prior to the early 1990s, release decisions for marine mammal species under the jurisdiction of the National Marine Fisheries Service (NMFS) were made by individual rehabilitation facilities without much direction or input from NMFS. Decisions were inconsistent and invoked 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 Marine Mammal Protection Act (MMPA) was amended to include Title IV, Section 402(a) which states 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, these guidelines were developed by NMFS and the U.S. Fish and Wildlife Service (FWS) in consultation with marine mammal experts through review and public comment of the 1997 draft National Oceanic and Atmospheric Administration (NOAA) Technical Memorandum "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 (*Enhydra lutris*), and manatees (*Trichechus manatus*). 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.

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 NMFS (Department of Commerce) and those under the jurisdiction of the FWS (Department of the Interior);

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 a 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 releasable rehabilitated marine mammal, selection of a release site, and post-release monitoring; and
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.

1.2 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 walruses (*Odobenus rosmarus*), are the responsibility of NMFS (i.e., NMFS species). Walruses, polar bears (*Ursus maritimus*), manatees, and sea otters are the responsibility of FWS (i.e., FWS species). NMFS and FWS responsibilities for these species are regulated under 50 CFR (See Appendix B).

Rehabilitation and release of wild marine mammals is authorized by key statements within the MMPA (16 U.S.C. 1379 §109(h)) entitled "Taking of Marine Mammals as Part of Official Duties." This section allows for the humane taking of a marine mammal, by a Federal, State, or local government official or employee or a person designated under section 112(c) of the MMPA, 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 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…" and (b)(1) "The attending veterinarian shall provide the Regional Director or Office Director with a

written report setting forth the basis of any determination." Also, (a)(iii) "releasability must be re-evaluated at intervals of no less that 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 MMPA section 112 (c) Stranding Agreements (formerly Letters of Agreement or LOAs) are formally established between the *NMFS Regions* and *Stranding Network Participants*. 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 titles and citations of these laws and regulations.

1.3 Structure of the Document

This document is organized as follows: General Procedures (Section 2); Guidelines for Release of Rehabilitated Cetaceans (Section 3); Guidelines for Release of Rehabilitated Pinnipeds (Section 4); Guidelines for Release of Rehabilitated Manatees (Section 5); Guidelines for Release of Rehabilitated Sea Otter (Section 6); Policies Regarding Release of Rehabilitated Polar Bears (Section 7); References (Section 8); Glossary of Terms (Section 9); and Appendices (Section 10).

The approach developed in this document primarily involves a complete assessment of an animal's health and behavior and release logistics. The assessment is completed by the attending veterinarian and their Assessment Team following this standardized guidance for determining the disposition of a marine mammal after treatment and rehabilitation. Section 2, "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.

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 3-7) for 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, lists of Diseases of Concern, and related references for cetaceans, pinnipeds, manatees, and sea otters.

1.4 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 John H. Prescott Marine Mammal Rescue Assistance 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 website: http://www.nmfs.noaa.gov/pr/health/prescott/.

2. General Procedures

2.1 Stranding Agreements, MMPA 109(h) Authority, and Permits for Stranding Response for ESA species

2.1.1 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 Agreement states that the Stranding Network Participant will obey laws, regulations, and guidelines governing marine mammal stranding response and rehabilitation. This includes 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 No. 932-1489-09*, as amended, and requires authorization and direction from the NMFS Regional Stranding Coordinator in the event of a stranding involving a threatened or endangered marine mammal.

2.1.2 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 *Division of Management Authority (DMA)* in the FWS Headquarters Office in Arlington, VA. For ESA-listed species, an LOA holder is authorized under a permit issued by the DMA. The *FWS Field Offices* in the lower 48 states or the *Marine Mammals Management Office in Alaska* coordinate with LOA and permit holders for all rescue, rehabilitation, and release activities for species under their jurisdiction.

2.2 Parties Responsible for Release Determinations and Overview of Agency Approval

The *attending veterinarian* and their *Assessment Team* (i.e., veterinarians, lead animal care supervisor, and/or 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 a written recommendation for release or non-release**. For NMFS species, the recommendations are sent to the NMFS Regional Administrator. For FWS species, the**

recommendations are sent to the FWS Field Office and any recommendations for non-release are coordinated with the FWS Division of Management Authority.

In general, for NMFS species that are deemed "Releasable," a 15-day advance written notification is necessary. However, 50 CFR 216.27 (a)(2)(i)(A) allows for waiving this advance notification in writing by the Regional Administrator. Generally, these cases are anticipated (e.g., the typical annual cluster of cases where the etiology is known and diagnosis and treatment is routine) and can be appropriately planned. For such waivers, the Stranding Network Participant should submit a protocol for such cases, 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* includes a signed statement from the attending veterinarian, in consultation with their 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 (*letter of concurrence from the Regional Administrator*) (50 CFR 216.27). 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 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 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 evaluated for releasability 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.

Generally for animals deemed "Non-releasable" and with the concurrence from the NMFS Regional Administrator, the animal can be permanently placed in a public display or research facility or euthanized. If the animals is to be placed in permanent captivity, the receiving facility must be registered or hold a license from the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) [7 U.S.C. 2131 *et seq.*] and comply with MMPA (16 U.S.C. 1374 §104(c)(7)). These facilities (i.e., the rehabilitation facility or another authorized facility) are required to send a *Letter of Intent* to the Office of Protected Resources, Permits, Conservation and Education Division (NMFS PR1) to permanently retain or acquire the animal (information available at http://www.nmfs.noaa.gov/pr/permits/mmpa_permits.htm). This letter should include a signature of the *"Responsible Party of Record".* As part of the decision making process, NMFS will consult with APHIS and may review the qualifications and experience of staff, transport protocols, 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, NMFS PR1 will respond with a *Transfer Authorization Letter* and include Marine Mammal Datasheets (MMDS), OMB Form 0648-0084, to be returned to NMFS PR1 within 30 days of transfer. Upon receipt of the MMDS, NMFS PR1 will acknowledge the transfer in writing and return updated MMDS to the receiving facility.

For FWS species, LOA and permit holders provide recommendations to the FWS Field Offices for decisions regarding releasability of rehabilitated marine mammals (see Appendix H for contact information). The FWS 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 section 104(c)(7) of the MMPA for non-depleted species, or section 104(c)(3) or section 104(c)(4) and section 10(a)(1)(A) of the ESA for depleted species.

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 determine the suitability of the release site and release conditions (see taxa specific sections for further guidance).

For cases involving declared *UMEs*, 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.

2.3 Documentation for Rehabilitation and Release of Marine Mammals

2.3.1 NMFS

Pursuant to the Stranding Agreement between the Stranding Network Participant and appropriate NMFS Regional Office that allows a stranding organization to respond to and/or rehabilitate marine mammals, the Stranding Network Participant must provide documentation to NMFS regarding their activities that involve the taking and disposition of marine mammals as described below. The same holds true for actions under MMPA section 109(h). Figure 2.1 presents the 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 the appropriate NMFS Regional Office within the time stated in the 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 the appropriate NMFS Regional Office no later than 30 days following the final disposition (e.g. released or non-released) of the marine mammal or as prescribed in the 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 216.27 (a)(2)** (Appendix B)

  This regulation states that the custodian of a rehabilitated marine mammal must provide the appropriate NMFS Regional Office 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 (e.g., the typical annual cluster of cases where the etiology is known and diagnosis and treatment is routine) by the NMFS Regional Administrator in accordance with specific requirements as stated in the Stranding Agreement. The required notification (release determination recommendation) should provide information sufficient for determining the appropriateness of the release plan, including a description of the marine mammal (i.e., 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)). The release recommendation should include 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 Animal 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 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). For guidance, see Appendix J for a Recommended Standard Checklist for Release Determination.

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

  For animals deemed "Non-releasable," and with the concurrence from the NMFS Regional Administrator, the animal can be permanently placed in a public display or research facility or be euthanized. If the animal is to be placed in permanent captivity, the receiving facility must be registered or hold a license from APHIS [7 U.S.C. 2131 *et seq*.] and comply with MMPA (16 U.S.C. 1374 §104(c)(7)). Facilities wishing to obtain non-releasable animals should send a *Letter of Intent* to NMFS PR1 to permanently retain (i.e., if affiliated with the rehabilitation facility) or acquire the animal. This letter should include a signature of the *"Responsible Party of Record".* As part of the decision making process NMFS will consult with APHIS and may review the, qualifications 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, NMFS PR1 will respond with a *Transfer Authorization Letter* and include MMDS, OMB Form 0648-0084, to be returned to NMFS PR1 within 30 days of transfer. Upon receipt of the MMDS, NMFS PR1 will acknowledge the transfer in writing and return updated MMDS to the receiving facility.

2.3.2 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. The required documentation for manatee rescue, rehabilitation, and release activities is provided in Appendix C.

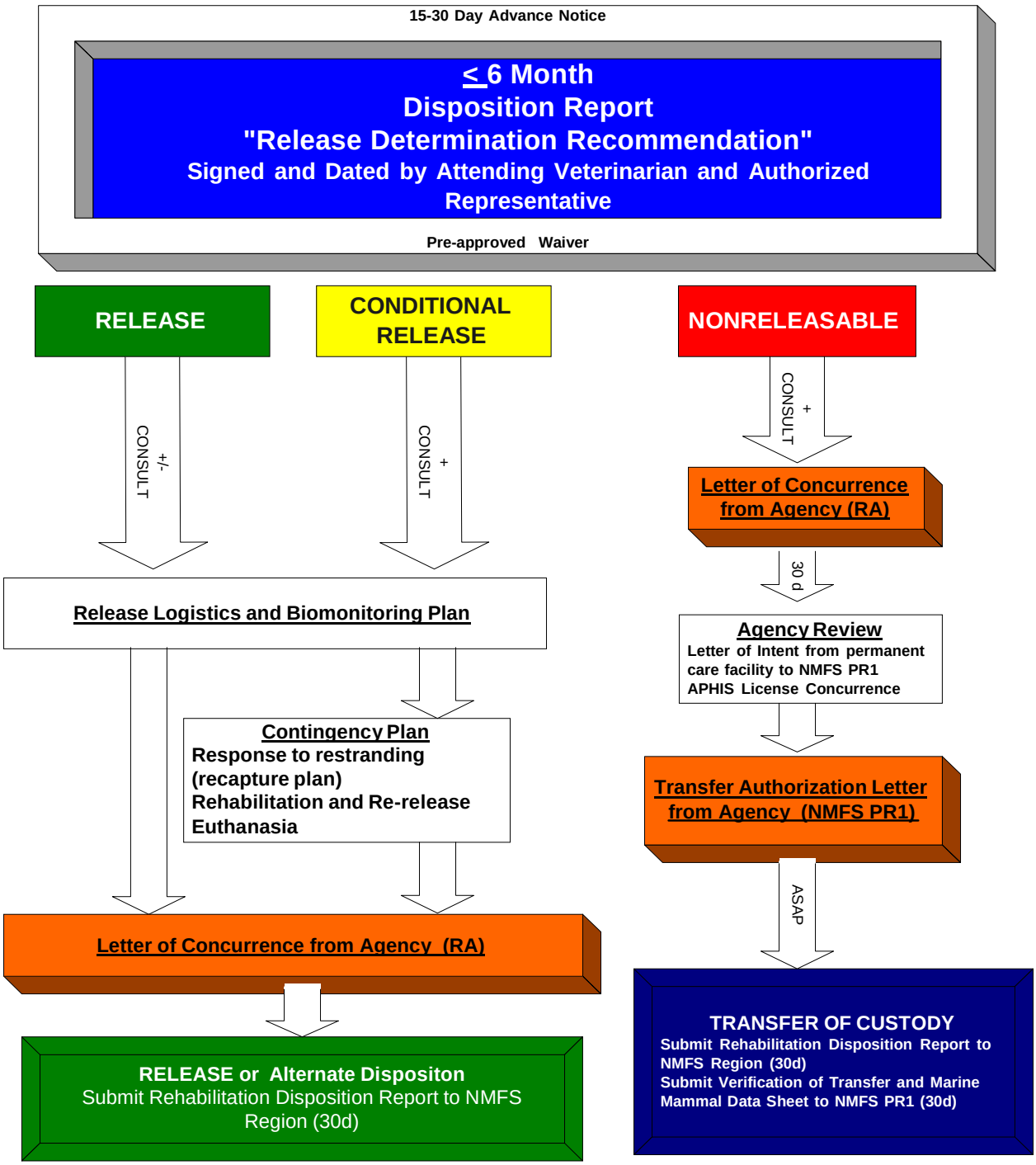

Figure 2.1 Documentation and Procedures Following Submission of the Written "Release Determination Recommendation."

2.4 Assessment Process for a Release Determination

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 **Non-releasable.** "Conditionally Non-releasable" is only a category for manatees because the FWS has had success releasing manatees that have been in captivity in excess of 20 years. NMFS species are deemed "Non-releasable" if they have been in captivity for over two years (see 50 CFR 216.27(a)(1)(iii)) and therefore a "Conditionally Non-releasable" category is not necessary. 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 the 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 all marine mammals that need socialization or expert care.

The Assessment should include the following steps and general parameters (see Figure 2.2 on page 2-16):

1. **Historical Assessment**. The Assessment Team should complete a historical evaluation that includes information gathered from the time of stranding through the duration of rehabilitation. Such information can impact the management of the case and determination of release. Circumstances such as 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 Niño, hurricane, extreme cold, extreme heat, changes in oceanographic parameters, etc.) should be documented. It should be noted if the animal: had previously stranded and been released; was part of an official UME; had been exposed to other wild or domestic animals just prior to and/or during rehabilitation; or had attacked and/or bitten (including mouthing of unprotected skin) 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 should have achieved a developmental stage wherein they are nutritionally independent. **Nursing nutritionally dependent 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 should 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 should 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 comm. Wells 2005). It goes beyond the assessment of the current condition of the animal in an artificial environment 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 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 a behavioral ecologist with knowledge of the species specific (or closely related species) solutions to ecological challenges in the wild. The behavioral ecologist would be familiar with the species 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 health trend and 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 UME. Specific testing requirements (i.e., pre-release health screen) will come from the NMFS Marine Mammal Health and Stranding Response Program (MMHSRP) through the National Stranding Coordinator and follows the term and responsibilities stated in the NMFS Stranding Agreement. For FWS species, contact the appropriate Field Office for guidance (see Appendix H 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 should 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 and Dierauf 2001). The rehabilitation facility may also harbor pathogens not encountered in the wild or new antibiotic resistant strains (Measures 2004, Moore *et al*. 2007, Stoddard *et al*. in press). 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 assessments 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 (see references and Appendices D, E, F, and G for partial list).

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 (i.e., 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. Because the number of pinnipeds entering a rehabilitation facility annually may be quite high and presenting with similar diagnosis, particularly in El Niño years, NMFS may waive additional clinical evaluation as mentioned above for each pinniped but instead require that a percentage of these animals entering a facility have a thorough 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, UMEs, 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, behavior, 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 Considerations**.

   a. **Required Identification Prior to Release.** Marine mammals must be marked prior to release for individual identification in the wild (see 50 CFR Sec. 216.27(a)(5) for species under NMFS jurisdiction). Examples of identification systems include flipper roto tags, flipper All-Flex tags, flipper Temple tags, passive integrated transponder tags (PIT tags), radio tags, satellite tags, and freeze branding (Geraci and Lounsbury 2005). Invasive tag application procedures should be done under the direct supervision of the attending veterinarian and will need prior approval from NMFS and FWS and may require a monitoring period following the procedure. Proper photo identification for some species should also be considered part of the 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 additional information.

      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 and/or USGS Stranding Coordinator. The NMFS National Marine Mammal Stranding Database centrally archives 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 216.27 (a)(2). Key factors in determining a release site include specific habitat, geographic and environmental factors such as weather and oceanographic states, 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. 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 is highly recommended and may be required by NMFS. Formal study of monitoring data and its dissemination to the stranding network will aid in the assessment of marine mammal rehabilitation and release programs.

2.5 Emergency or Special Situations

NMFS and FWS are responsible for monitoring and protecting the health of wild marine mammal populations. 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, UMEs, 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 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.

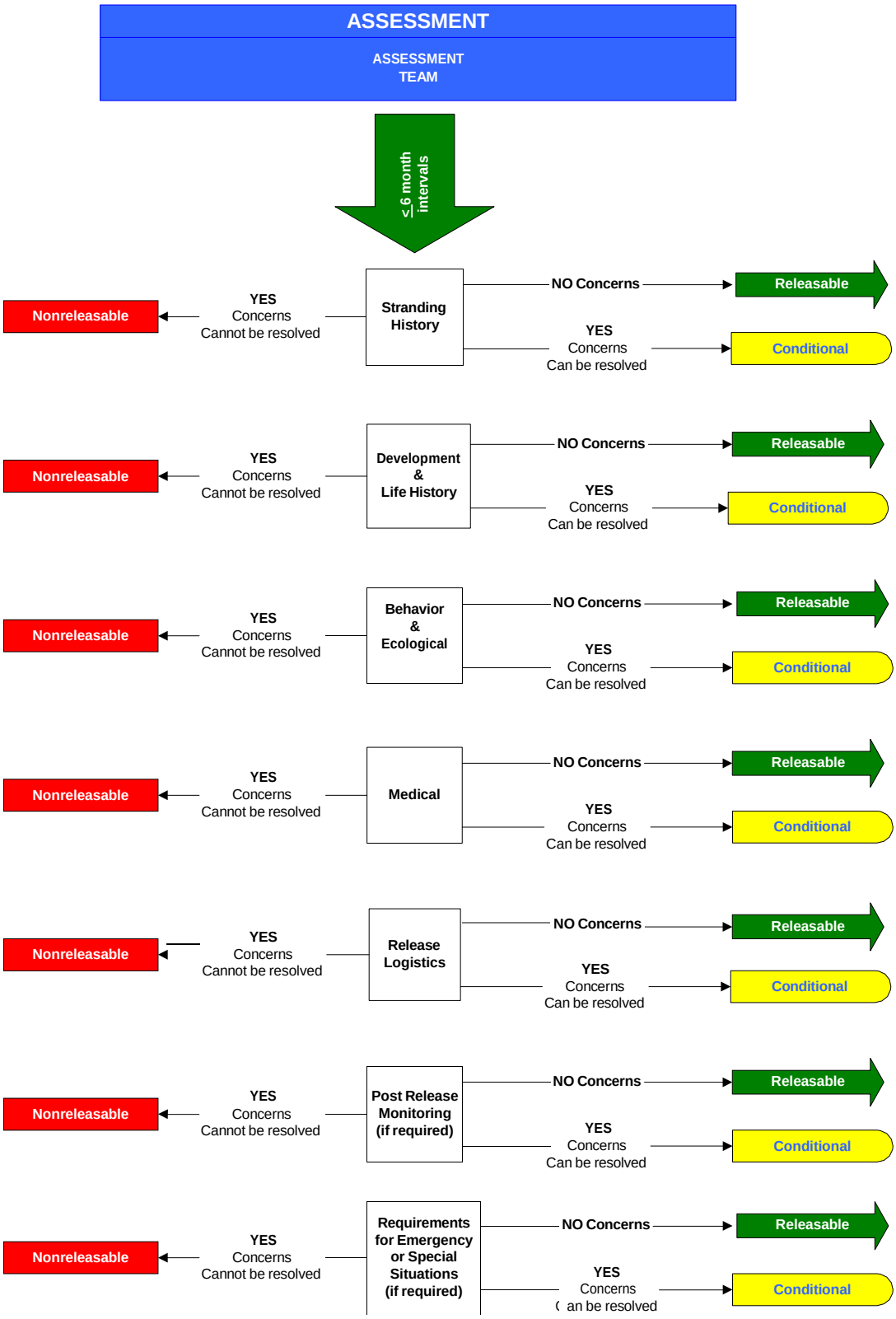

Figure 2.2 Steps and General Parameters for Animal Release Assessment

3. Guidelines for Release of Rehabilitated Cetaceans

3.1 Introduction

Few species of cetaceans (i.e., primarily bottlenose dolphins, rough-toothed dolphins, grampus dolphins, and harbor porpoise) are rehabilitated in the United States each year. Although the natural history of cetaceans differs among the various species, the general release criteria set forth in this document are applicable to all cetaceans in the United States. Prior to the release of any cetacean, 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 Regional Administrator at least 15 days (typically 30 days) in advance of a proposed release date. Waivers for advanced notice are not generally considered in cetacean cases. The release determination recommendation must include a signed statement from the attending veterinarian in consultation with their 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 a recapture contingency plan if the animal appears to be in distress or poses a risk following a specified time after release. 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).

3.2 Overview of "Release Categories" for Cetaceans

Cetaceans 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 (see Appendix J) be used to assess and document the release candidacy of rehabilitated cetaceans. The checklist includes a

health statement (i.e., health certificate) to be signed by the attending veterinarian and authorized representative, which verifies that a cetacean meets appropriate standards for release. This checklist could be used to determine and document releasability (i.e., as part of the required documentation sent to NMFS – refer to Figure 2.1) and as a final check just prior to release.

The case should fit into one of three **"RELEASE CATEGORIES:"**

1. **"RELEASABLE":** This category indicates that there are no significant concerns related to the 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 has been approved in writing by NMFS Regional Administrator via a letter of concurrence to the applicant.
2. **"CONDITIONALLY RELEASABLE":** This category indicates that 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. For some cases, NMFS may consult with individual experts to seek additional advice. The experts may include scientists and veterinarians with expertise in cetacean biology and medicine (i.e., particularly experts with species-specific knowledge). These discussions may reveal that additional medical testing, rehabilitative therapy, and strategies for post-release monitoring may be required to release a "Conditionally Releasable" cetacean.
3. **"NON-RELEASABLE":** This category indicates that 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.

For animals deemed "Non-releasable," and with the concurrence 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 be registered or hold a license from APHIS [7 U.S.C. 2131 *et seq*.] and comply with MMPA (16 U.S.C. 1374 §104(c)(7)). Facilities wishing to obtain non-releasable animals should send a *Letter of Intent* to NMFS PR1 to permanently retain (i.e., if affiliated with the rehabilitation facility) or acquire the animal. This letter should include a signature of the *Responsible Party of Record*. As part of the decision making process NMFS will consult with APHIS and may review the qualifications 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, NMFS PR1 will respond with a *Transfer Authorization Letter* and include MMDS and OMB Form 0648-0084, to be returned to NMFS PR1 within 30 days of transfer. Upon receipt of the MMDS, NMFS PR1 will acknowledge the transfer in writing and return updated MMDS to the receiving facility.

3.3 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 –** Stranded cetaceans that have previously stranded and been released, and subsequently strand again, are deemed "Conditionally Releasable" for further release attempts pending consultation with NMFS. Such animals should 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, calf, or both. If the calf dies or is euthanized, the mother could be considered for release following a thorough and appropriate assessment. If the mother dies or is euthanized, a dependent calf is likely non-releasable because it 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 UME** – If the stranding of a cetacean occurs close to (i.e., temporally and geographically) an ongoing epidemic of wild marine animals or to a UME, 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. NMFS may request additional testing, documentation, and/or post-release monitoring of such cetaceans.

4. **Stranding location and active/home range –** Stranded cetaceans may be deemed "Conditionally Releasable" if they stranded in areas where there is an increase in 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 Niño, hurricane, extreme cold, extreme heat, etc). The geographical distance between the stranding location and the rehabilitation facility is important to acknowledge, as there could be important differences in the microflora in the facility's water system. Information on areas of human activity and environmental hazards is also vital for determining an appropriate release site.
5. **The animal has been exposed to (or injured by) other wild or domestic animals –** Stranded cetaceans with a history of exposure to terrestrial wild (e.g., raccoons, coyotes, etc.) or domestic animals (e.g., cats, dogs, etc.) are deemed "Conditionally Releasable" and must be discussed with NMFS. There is a potential for zoonotic pathogens to be transmitted between wild or domestic animals to marine mammals but signs of clinical disease are undetectable. Additional testing may be required to better assess the health status and decrease the potential for transmitting diseases of concern to wild marine mammal populations following release. Consultation with NMFS is required for cetaceans that have a history of exposure to terrestrial animals.
6. **The animal 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. **The animal was evidence or part of a human interaction or criminal investigation** – **This includes an investigation by** NOAA Office of Law Enforcement, the U.S. Department of Justice, or other Federal, state or local authorities.
8. **The animal was 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 stranded animals being 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 released or 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.

9. **The animal was transferred from a research facility or undergoing permitted research during rehabilitation** – Research activity may extend the frequency and intensity of handling time and could increase the risk of altering behavior or increasing the chance of exposure to facility pathogens or chemicals (e.g., anesthetic agents, metabolic agents, etc). These animals will be considered "Conditionally Releasable" or "Nonreleasable."

3.4 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 I for Developmental Stages by Cetacean Species). For bottlenose dolphins (*Tursiops truncatus*), the age at which a calf may be completely weaned is approximately 1-4 yrs. Calves that are nutritionally dependent 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, dependent 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 may be considered "Conditionally Releasable" but require a thorough assessment and optimum planning for release and subsequent monitoring.

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 has 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 should be made to reduce their time in captivity and to keep the mother-calf pair together, yet allow for continued treatment and rehabilitation of both individuals if warranted.

Cases involving cetaceans showing signs of advanced age are considered "Conditionally Releasable" and should also be thoroughly evaluated and 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.

3.5 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 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 should breathe normally, including rate, pattern, quality, and absence of respiratory noise. A cetacean should swim and dive effectively without evidence of aberrant behavior or 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.

3.5.1 Breathing, Swimming, and Diving

The Assessment Team should evaluate respiration at the pre-release exam 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 should 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 that 50 ft 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 Releasable" or "Non-releasable" and must be discussed with NMFS.

3.5.2 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 "Non-releasable" and thus are to be fully discussed with NMFS.

3.5.3 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. Reduced auditory abilities can compromise the ecological

functionality and social abilities of some species, thus reducing the probability of survival in the wild. In each case, it is highly recommended that hydrophone-recording systems with an appropriate frequency response be used to record sound production in the water to document production of normal classes and qualities of sounds made by the cetacean. It is important to evaluate hearing if there are signs of compromised auditory function and diagnostic testing such as auditory evoked potential (AEP) may be necessary to further evaluate the anima. Such testing 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.

3.5.4 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. Normal consumption of solid food should also be part of the medical assessment. This demonstrates the ability to swallow and that there is no pharangeal and/or gastrointestinal abnormalities. This evaluation is especially important for young and geriatric animals. 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).

3.5.5 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 which is an important behavioral mechanism for predatory avoidance.

3.5.6 Social Factors

The survival of an individual cetacean may be critically dependent on social organization and conspecifics (see Appendix I 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 social groups. The composition of these groups should be carefully considered when animals are recovered from a stranding and considered for release. 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 manner 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 of the stranding (e.g., evidence of extensive fresh tooth raking marks in the absence of other medical factors) and should be considered. Other factors that are important for proper socialization and should be evaluated include hearing, sound production, missing appendages, and missing teeth.

3.6 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, and medical and husbandry records. 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 a 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 UME or suspected anthropogenic exposure (e.g., acoustic insult, hazardous waste spill, etc.). NMFS may request testing for other emerging diseases 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 MMHSRP. Appendix D lists diseases of concern for cetaceans.

A complete health screen should be completed upon admission and just prior to release including basic blood collection for a CBC, chemistry profile (including BUN and creatinine, enzymes and electrolytes), serology, microbial and fungal culture (i.e., blow hole, rectal, ocular, and lesions), cytology, urinalysis, and fecal exam. If the animal is female and at reproductive age, it is advisable that pregnancy be determined as soon as possible to avoid potentially fetal toxic medication. Serum (3ml/each) 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. When this recommendation cannot be met, seek advice from NMFS. **The attending veterinarian should provide written notification to the NMFS Regional Stranding Coordinator that a health screen and assessment of the cetacean 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 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 stress the animal increasing its susceptibility to disease. If not properly managed, rehabilitation facilities provide an environment where mutated or novel pathogens not typically encountered in the wild can easily be transmitted from animal to animal. This scenario can become problematic if an animal is exposed during rehabilitation and may carry a pathogen to a naïve wild population upon release. Introduction

of pathogens from rehabilitation centers to the wild is a concern as diseases with serious epizootic potential have previously been detected (Measures 2004, Moore *et al*. 2007, and Stoddard *et al*. in press). During rehabilitation, infectious agents may become altered (i.e., change in virulence and infectivity) as they pass through new hosts or mix with other microbes and potentially result in a multi-antibiotic resistance strain.

The attending veterinarian is urged to utilize the full spectrum of diagnostic modalities available for health assessment of the cetacean. In addition to the complete health screen analyses, 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.

3.7 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. Consideration should also be given to the 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 dependent 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.

3.8 Marking for Individual Identification of Cetaceans Prior to Release

Three forms of identification have routinely been used for cetaceans including photo-identification (documenting individual identifying physical characteristics such as scars, color pattern, dorsal fin shape, etc.), freeze branding, and dorsal fin tags. NMFS recommends the use of all three forms of identification for all releases. For delphinids, photo-identification should include body, face, dorsal fin, flukes, and pectoral flippers. Numerical freeze brands should be at least 2" high and may be placed on both sides of the dorsal fin and/or 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. Marking of non-delphinid cetaceans can be more challenging due to unique anatomical features and should be determined in consultation with NMFS. NMFS must receive advance notification of and approve any additional forms of identification that a rehabilitation facility voluntarily wants to place on a cetacean besides those mentioned above. 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 require VHF or satellite tagging in addition to photo-identification, freeze-branding, and placement of a visual fin tag.

3.9 Post-Release Monitoring of Cetaceans

Few data is currently available regarding the long-term 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. In a few instances, NMFS has provided resources such as financial support, personnel, and equipment for post-release monitoring but it is not standard practice. Therefore, the rehabilitation facility is encouraged to seek funding to enhance their post-release monitoring program.

The first month after release 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 year. Funding resources, such as the Prescott 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 should include the contingency plans that are available for recovering the animal, 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 require such contingency plans for "Conditionally Releasable" cetaceans, depending on the circumstances.

3.10 Decision Tree – Cetacean Release Categories

3.10.1 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). For an animal to be considered "releasable" the response to all of the essential release criteria below should be met.

History

Cetacean has no historical information requiring consultation with NMFS such as stranding in close temporal or geographic relation to a UME, stranding associated with an environmental event of concern,, an acoustic insult, a human interaction or criminal investigation, or 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 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.
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.
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.
b) Hands-on physical exam by the veterinarian at time of admission to rehabilitation and within 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.

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.

3.10.2 Conditionally Releasable

The cetacean did not meet one or more of the essential release criteria but may be releasable in the future pending resolution of the problems identified by the attending veterinarian and Assessment Team.. This may involve discussion with outside experts in consultation with NMFS. Contingency plans for recapture, treatment, permanent care, and euthanasia should be required if release is unsuccessful and the animal restrands. The following may be true for one or more assessment points.

History

a) Cetacean stranded in close temporal or geographic relation to a UME.
b) Cetacean stranded in association with an environmental event of concern or 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.
f) Cetacean was part of a NMFS permitted research project, potentially being handled more frequently.

Developmental Stage/Life History

a) Cetacean is nutritionally dependent, 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 to injury from conspecifics.

Medical Assessment - The attending veterinarian determines that the health status of the cetacean is uncertain regarding suitability for release. 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 deemed 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. Monitoring is 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 or natural history factors - 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 request a contingency plan if feasible for a "Conditionally Releasable" cetacean prior to its release should the animal appear to be unable to readjust to the wild. This should include plans for follow up treatment, permanent care and/or euthanasia. The cetacean will continue to be deemed "Conditionally Releasable" until NMFS approves a contingency plan.

3.10.3 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.

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.
c) Cetacean was part of a NMFS permitted research project, potentially being handled more frequently, and circumstances preclude its suitability for release.

Developmental Stage/Life History

a) Cetacean is nutritionally and socially dependent (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 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 deemed necessary to fully evaluate the animal. Further tests may be required,

including ultrasound or radiographs, to clarify medical issues. The veterinarian presents their 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 is 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, or 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.

4. Guidelines for Release of Rehabilitated Pinnipeds

4.1 Introduction

Each year in the United States, several different species of pinnipeds from three taxonomic families, Phocidae (true seals), Otariidae (eared seals), and 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 the 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 216.27(a)(2)(i)(A). Typically these cases are anticipated (e.g., the typical annual cluster of cases where the etiology is known and diagnosis and treatment is routine) and can be appropriately planned. For such waivers, the Stranding Network Participant should submit a protocol for such cases including location of release. These waivers will require pre-approval by the NMFS Regional Administrator on a schedule as prescribed in the Stranding Agreement. 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.

4.2 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 (see Appendix J) should 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 and authorized representative, which verifies that a pinniped meets appropriate standards for release. This checklist could be used to determine and document releasability (i.e., as part of the required documentation sent to NMFS) and as a final check just prior to release.

The majority of walrus typically strand as calves and are not good release candidates due to the extended period of maternal dependency. FWS generally considers walrus calves to be "non-releasable" 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 U.S.C. 2131 *et seq*.] and comply with MMPA (16 U.S.C. 1374 §104(c)(7)). Questions regarding disposition of stranded walrus should be directed to the FWS contact as identified in Appendix H.

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, contingency plans, 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 should 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) for species under NMFS jurisdiction).

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. For NMFS species, 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. Rehabilitation facilities that believe that they may have a walrus that is non-releasable must contact the FWS Marine Mammals Management Office (as identified in Appendix H) for concurrence on this finding and eventual disposition of the animal. If FWS determines that a walrus 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.

   For animals deemed "Non-releasable" and with the concurrence 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 be registered or hold a license from APHIS [7 USC 2131 et seq.] and comply with MMPA (16 USC 1374 Section 104(c)(7)). Facilities wishing to obtain non-releasable animals should send a *Letter of Intent* to NMFS PR1 to permanently retain (i.e., if affiliated with the rehabilitation facility) or acquire the animal. This letter should include a signature of the *"Responsible Party of Record".* As part of the decision making process will consult with APHIS and may review the qualifications 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, NMFS PR1

will respond with a *Transfer Authorization Letter* and include MMDS, OMB Form 0648-0084, to be returned to NMFS PR1 within 30 days of transfer. Upon receipt of the MMDS, NMFS PR1 will acknowledge the transfer in writing and return updated MMDS to the receiving facility.

4.3 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 should be reassessed 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 UME -** If the stranding of a pinniped occurs in close temporal or geographic proximity to a UME, 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 Niño, hurricane, extreme cold, extreme heat, etc). During an El Niño event, the rehabilitation center should 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." Also, the geographical distance between the stranding location and the rehabilitation facility is important to acknowledge as there could be important differences in the microflora at the facility. Information on areas of human activity and environmental hazards is also vital for determining an appropriate release site.

4. **The animal was exposed to (or injured by) other wild or domestic animals -** Pinnipeds having a history of exposure (i.e., confirmed or suspected) 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 an 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 (i.e., confirmed or suspected) to terrestrial animals.

5. **The animal has a record of attacking or biting a human -** Pinnipeds that have inflicted a bite (including mouthing of unprotected skin) of 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 (there is one published case of rabies in a ringed seal from the Svalbard Islands, Norway [Odegaard and Krogsrud 1981]) 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. **The animal was evidence or part of a human interaction or criminal investigation** – **This includes an investigation by** NOAA Office of Law Enforcement, the U.S. Department of Justice, or other Federal, state or local authorities.

7. **The animal 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.

8. **The animal was transferred from research facility or undergoing permitted research during rehabilitation** – Research activity may extend the frequency and intensity of handling time and therefore could increase the risk of altering behavior or increasing the

chance of exposure to facility pathogens or chemicals (e.g., anesthetic agents, metabolic agents, etc). These animals will be considered "Conditionally Releasable" or "Non-releasable."

4.4 Developmental Assessment of Pinnipeds

In order to be deemed "Releasable," a young pinniped should 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 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 the 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 (see Appendix I for species specific developmental stages and pupping information). The risk of altered behavior can be related to both the length of treatment and the age of the animal at the time of stranding. Pups stranded as maternally dependent neonates and animals spending an extended time in rehabilitation being at highest risk. Special care should be taken with these species especially if rehabilitating very young pups and should be considered "Conditionally Releasable".

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 pinnipeds health history, age, reproductive status, and other relevant parameters should be considered in order to determine if release is preferable to holding the animal until molting is completed.

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

4.5.1 Breathing, Swimming, Diving, and 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.

4.5.2 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 an 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. Other examples include

attraction to or desensitization to the presence of humans such as in the case of pups imprinting on humans. Pinnipeds displaying aberrant behavior are deemed "Conditionally Releasable" or "Non-Releasable" depending on the nature and degree of the behavior.

4.5.3 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.

4.5.4 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 "Non-releasable." 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.

4.6 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 UME. 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 MMHSRP. Appendix E lists diseases of concern for pinnipeds.

A complete health screen should be completed upon admission and just prior to release including basic blood collection for a CBC, chemistry profile (including BUN and creatinine, enzymes and electrolytes), serology, microbial and fungal culture (i.e., nasal, rectal, ocular, and lesions), cytology, urinalysis, and fecal exam. If the animal is female and at reproductive age, it is advisable that pregnancy is ruled out prior to prescribing potentially fetal toxic medication. Serum (3ml/each) 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 dependent 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 attending veterinarian should provide written notification to the NMFS Regional Stranding Coordinator that a pre-release health screen of the pinniped has been performed two weeks prior to release and will be conducted within 72 hours of release as a final check. The two week notification must also include the final release plan. The final assessment at the 72 hour mark can be emailed just prior to the release or immediately following the release as prescribed by the NMFS Regional Stranding Coordinator. 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 (Measures 2004, Moore et. al., 2007). 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 UME. Specific testing requirements (i.e., pre-release health screen) will come from the NMFS Regional Stranding Coordinator through the MMHSRP and follows the term and responsibilities stated in the NMFS Stranding Agreement.

4.7 Release Site Selection for Pinnipeds

The release of a rehabilitated pinniped should be planned to maximize its chances for survival. The release should 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 should be considered. Weather conditions at the release site and other environmental factors impacting the habitat and food availability should 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 wide ranging 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 the range of conspecifics is distant form 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 should 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 an infectious disease cannot be released near their original

stranding site. Another important consideration is the location of the rehabilitation facility to the normal habitat range for the species, e.g., the rehabilitation of an ice seal in the Caribbean. The decision to release in the normal habitat range would need to be thoroughly discussed with NMFS.

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.

4.8 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 and/or USGS (for walrus) as appropriate for the pinniped species (see Appendix H 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 (Geraci and Lounsbury 2005).

4.9 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 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 contingency plans 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.

5. Guidelines for Release of Rehabilitated Manatees

5.1 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. All rescue-related communications and the day to day decision making process in the field are generally handled by the local field Stations of the Florida Fish and Wildlife Conservation Commission (FWC) in conjunction with report from the public utilizing the FWC hotline (1-888-404-FWCC). All activities related to the verification of a report of a manatee in trouble, subsequent rescue, and transport to rehabilitation facilities are communicated through the FWC Field Stations, according to established protocols. 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 ESA/MMPA marine mammal enhancement permit issued by the FWS 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 authorized as subpermittees under their enhancement permit and through LOAs issued under section 109(h) and section 112(c) of the MMPA [16 U.S.C. 1379(h) and 16 U.S.C. 1382(c)] to authorize activities related to the rescue (including temporary capture, possession, transport, and transfer), rehabilitation, and post-release monitoring of manatees.

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.

5.2 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 "Conditionally 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. Because manatees are closely monitored post release (i.e., their normal habitat range is coastal and thus easier to monitor post release) and data have shown that they can survive and thrive post release even after many years in captivity, this category has been added.

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 CRF 17.22.

5.3 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.

5.4 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. 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" manatees will be reviewed by the FWS on a case-by-case basis.

5.5 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. Naïve 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.

5.6 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 blood work, 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".

5.7 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.)

5.7.1 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, naïve 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.

5.7.2 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).

5.7.3 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.

5.7.4 NON-RELEASEABLE

a) Animals deemed permanently non-releasable will be:
   i. Permanently 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)(3) or (c)(4) 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 and 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.

5.8 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.

5.9 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 naïve

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.

5.10 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.

6. Guidelines for Release of Rehabilitated Sea Otters

6.1 Introduction

Sea otters are found in near shore waters of the North Pacific. Several subspecies and stocks have been identified in California, Washington, Alaska, Canada, and Russia. Sea otters may strand for a variety of reasons including trauma, disease, and the inability to forage. Guidelines for the 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 H.

6.2 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 lbs), 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 lbs 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 H) to determine the disposition of the animal.

Rehabilitated sea otter pups that are at least 6 months of age, weigh at least 20 lbs, 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).

6.3 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.

6.4 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, 2nd Edition, Dierauf and Gulland 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.

6.5 Release Categories for Sea Otters

Despite the 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:

1. **"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.

2. **"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.

3. **"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 H) 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 for non-depleted species, or section 104(c)(3) or (c)(4) and section 10 of the ESA for depleted species.

6.6 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.

6.7 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 H). In all cases, rehabilitated sea otters must be released into the same stock or population from which they originated.

6.8 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).

7. Policies Regarding Release of Rehabilitated Polar Bears

Polar bears 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, FWS does 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, FWS 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 H.

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APPENDIX A

Chronology of Development of the Release Criteria

1977 1st Workshop on Marine Mammal Strandings; sponsored by the Marine Mammal Commission - Geraci, J.R. and D. J. St Aubin (eds.) 1979. Biology of marine mammals: Insights through strandings. Marine Mammal Commission. Report. No. MMC-77/13. U.S. Department of Commerce, NTIS Doc. PB 293 890, 343 p. (August 1977- Athens, GA).

One of the workshop objectives was to 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 2nd 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. U.S. Department of Commerce., NOAA Technical Report. NMFS 1998.

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. Department of Commerce, NOAA Technical Memorandum 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 seven 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…"

1991-1997 Working Group of Marine Mammal Unusual Mortality Events – This group established under Title IV of the Marine Mammal Protection Act closely guided the development of the first draft that was published in 1998.

1998 FR Notice Draft NOAA Technical Memorandum - 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 on Draft NOAA Technical Memorandum - NMFS and FWS Release for Stranded Marine Mammals to the Wild: Background, Preparation, and Release Criteria

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 comment period. Their recommendations have been incorporated into the current document.

APPENDIX B

Key Legislation: Marine Mammal Rescue, Rehabilitation, and Release to the Wild

- **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

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APPENDIX C

REQUIRED REPORTING AND DOCUMENTATION

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

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

Manatee Rescue, Rehabilitation and Release Report

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Manatee Rescue, Rehabilitation, and Release Report Fields

Rescue: Reporting Requirements	**Release: Request Information**	**Transfer: Request Information**	**Death: Reporting Requirements**	**Captive Birth: 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	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	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	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 Euthanized) Disposition of Carcass Veterinarian Facility Supervisor Name of Reporter Telephone Number	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

DISEASES OF CURRENT CONCERN FOR CETACEANS

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.

A good resource to obtain updated literature on diseases of marine mammals is through the Animal Welfare Information Center (http://awic.nal.usda.gov), part of the United States Department of Agriculture National Agriculture Library.

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 humans. (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 areus* 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).

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APPENDIX E

DISEASES OF CURRENT CONCERN FOR PINNIPEDS

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.

A good resource to obtain updated literature on marine mammal diseases is through the Animal Welfare Information Center (http://awic.nal.usda.gov), part of the United States Department of Agriculture, National Agriculture Library.

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).

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APPENDIX F

DISEASES AND ISSUES OF CURRENT CONCERN FOR MANATEES

The diseases and issues listed below are of current concern for manatees. Other diseases exist among manatees and should also be considered during diagnostic work-ups. Testing for specific diseases of manatees is not required at this time. However, thorough diagnostic testing of rehabilitated manatees is strongly recommended 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 concern exists regarding the animal's likelihood of survival in the wild. Contact the FWS stranding support staff for information regarding the appropriate diagnostic laboratories.

A good resource to obtain updated literature on marine mammal diseases is through the Animal Welfare Information Center (http://awic.nal.usda.gov), part of the United States Department of Agriculture National Agriculture Library.

BACTERIAL DISEASES	**COMMENTS**
Brucellosis	Antibodies to *Brucella* spp. have been reported in Florida manatees, although lesions consistent with brucellosis have not been observed (Geraci et al., 1999).
Other	Systemic mycobacteriosis due to *Mycobacterium marinum* and *M. chelonei (Boever et al., 1976),* and mycotic dermatitis (Dilbone, 1965; Tabuchi et al., 1974), have been reported in adult manatees.
VIRAL DISEASES	
Cutaneous papillomatosis	Recently described in a captive population of manatees. PCR analyses has demonstrated a virus consistent with Type I bovine papilloma virus. (Bossart et al., 1998a)
Morbillivirus	Serologic evidence of morbillivirus has been demonstrated in manatees, although signs of clinical disease or active infection has not been observed (Duignan et al., 1995).
Other	Pseudorabies, San Miguel sea lion virus Type I, and eastern, western, and Venezuelan equine encephalitis have been reported in Florida manatees (Geraci et al., 1999). While these are serologically evident, no signs of clinical disease or active infection have been observed.

PARASITIC DISEASES

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 *Kerenia 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 aver the past few decades (Bossart 2001).

APPENDIX G

DISEASES OF CURRENT CONCERN FOR SEA OTTERS

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.

A good resource to obtain updated literature on marine mammal diseases is through the Animal Welfare Information Center (http://awic.nal.usda.gov), part of the United States Department of Agriculture, National Agriculture Library.

BACTERIAL DISEASES	COMMENTS
Septicemias	Overwhelming bacterial infections, sometimes from infected wounds, dental problems, and intestinal infections, are a common cause of mortality in southern sea otters, often secondary to infectional perforation by acanthocephalans (California Department of Fish and Game (CDFG) unpublished data), and a significant cause of mortality in northern sea otters in Alaska (FWS unpublished data). Connections with sewage or animal wastes are suspected in some infections; however, for northern sea otters, the source of this infection is often unknown.
Valvular endocarditis	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 a primary source (FWS unpublished data). These animals have tested positive for the *Streptococcus bovis/equinus* complex. In human cases, there is an association between *S.bovis* endocarditis cases and a malignancy of the GI tract.
Brucellosis	One culture and PCR-confirmed case in a California sea otter with a chronic toe joint infection and low-level systemic disease (CDFG unpublished data). Fastidious in culture and easily missed. Marine Brucellae have demonstrated zoonotic potential, so caution is advised when handling fetal tissues, or live or dead animals with infected joints and wounds.

Dental disease Dental disease is common, particularly in older animals and can lead to systemic bacterial infections.

Leptospirosis Problem common in sea lions (see above pinniped section). Positive serologic titers in southern sea otters (Hanni *et al*. 2003). Cases reported in northern sea otters in Washington State. No clinical case identified in southern sea otters to date, although seropositive animals are observed. No cases reported for northern sea otters in Alaska.

FUNGAL DISEASES

Coccidiomycosis Low levels of infections (less than 1 percent) in southern sea otters, mostly off the San Luis Obispo county coast around the mouth of the Santa Maria River. Cases always fatal. Not reported in northern sea otters. Biohazard for people handling dead sea otters.

VIRAL DISEASES

Morbillivirus Conflicting evidence on whether exposure is relatively common or not in southern sea otters. Canine distemper has been diagnosed in a river otter in coastal British Columbia (Mos *et al*. 2003) and positive serologic titers have been noted in northern sea otters in Washington State. Care must be taken in moving otters if this virus is present in some populations and not others. Seropositivity to both canine and phocine distemper has been identified in northern sea otters in Washington and Alaska (FWS unpublished data).

Papillomavirus Some evidence of this type of viral infection occurs, significance probably not great. Typically presents as small, raised variably pigmented plaques on the lips, tongue, or buccal mucosa. Occurrence often episodic and invariably incidental in southern sea otters (CDFG unpublished data).

Herpesvirus Associated with corneal, oral, and esophageal ulcers, often in debilitated animals in California and Alaska.

PARASITIC DISEASES

Toxoplasma gondii	Protozoan parasite which can cause serious disease and death in southern sea otters (Miller *et al*. 2004) and northern sea otters in Washington State. High prevalence of exposure in California with moderate mortality rate. There is evidence of wide exposure in California and Washington State (Lindsay *et al*. 2001; Miller *et al*. 2002; Dubey *et al*. 2003; Conrad *et al.* 2005). Northern sea otters in Alaska rarely test positive (FWS unpublished data). Source of infection not clearly defined but hypothesized to be associated with freshwater inputs to the ocean in California (Miller *et al*. 2002; Dailey 2001; Migaki 1990).
Sarcocystis neurona	Protozoan parasite that may cause severe neurologic disease and death. Important cause of mortality among southern sea otters and northern sea otters in Washington State. Infections appear to progress more quickly than *T. gondii* (Miller *et al*. 2001; Miller 2006). No evidence of this in northern sea otters in Alaska.
Helminths	A variety of nematode, trematode, and cestode parasites infect sea otters, causing varying degrees of clinical disease. Acanthocephalan thorny headed worms, particularly the *Profilicollis* spp. may be pathogenic when overwhelming infestations occur, particularly in young animals (Mayer *et al.* 2003).
Mites	Nasal mite infestations are uncommon in wild animals, but heavy infections may occur in captive and rehabilitated animals. Heavy infections can result in secondary bacterial nasopharyngitis and pneumonia.
Giardia	Some live, captive 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, fishing lines, and hooks 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 of sea otters in California (Gulland 2000; Jessup *et al.* 2004).

Persistent Organic Pollutants	Levels in southern sea otters and northern sea otters in Alaska adjacent to known military dump sites are high (50-100 times control populations). Potential effects on endocrine and immune functions are a cause for concern, but evidence for this or for acute toxicity are lacking.
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 known 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.

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APPENDIX H

Contact Information for NMFS and FWS National and Regional Stranding Support Staff

National Marine Fisheries Service

OFFICE	ADDRESS	PHONE
Headquarters	Office of Protected Resources Marine Mammal Health and Stranding Response Program 1315 East-West Highway Silver Spring, MD 20910	Phone: (301) 713-2322 Fax: (301) 427-2522
Northeast Region	Administrator, Northeast Region One Blackburn Drive Gloucester, MA 01930-2298	Phone: (978) 281-9250 Fax: (978) 281-9207
Southeast Region	Administrator, Southeast Region 263 13th Ave. South St. Petersburg, FL 33701	Phone: (727) 824-5301 Fax: (727) 824-5320
Northwest Region	Administrator, Northwest Region 7600 Sand Point Way, NE Bin C 15700, Bldg. 1 Seattle, WA 98115-0070	Phone: (206) 526-6150 Fax: (206) 526-6426
Southwest Region	Administrator, Southwest Region 501 West Ocean Blvd. Suite 4200 Long Beach, CA 90802-4213	Phone: (562) 980-4001 Fax: (562) 980-4018
Alaska Region	Administrator, Alaska Region P.O. Box 21668 Juneau, AK 99802-1668	Phone: (907) 586-7221 Fax: (907) 586-7249
Pacific Islands Region	Administrator, Pacific Islands Region 1601 Kapiolani Blvd., Suite 1110 Honolulu, HI 96814	Phone: (808) 944-2280 Fax: (808) 973-2941

U.S. Fish and Wildlife Service

OFFICE	ADDRESS	PHONE
Headquarters	Division of Habitat and Resource Conservation 4401 N. Fairfax Drive, Room 400 Arlington, VA 22203	Phone: (703) 358-2161 Fax: (703) 258-1869
LOAs and Permits	Division of Management Authority 4401 N. Fairfax Drive, Room 700 Arlington, VA 22203	Phone: (703) 358-2104 Fax: (703) 358-2281
Manatees	Jacksonville Field Office 6620 Southpoint Drive South, Suite 310 Jacksonville, FL 32216	Phone: (904) 232-2580 Fax: (904) 232-2404
Southern Sea Otters in California	Ventura Field Office 2493 Portola Road, Suite B Ventura, CA 93004	Phone: (805) 644-1766 Fax: (805) 644-3958
Northern Sea Otters in Washington	Washington Field Office 510 Desmond Drive SE, Suite 102 Lacey, WA	Phone: (360) 753-9440 Fax: (360) 753-9518
Polar Bears, Pacific Walrus, and Northern Sea Otters in Alaska	Marine Mammals Management Office 1011 E. Tudor Road Anchorage, AK 99503	Phone: (907) 786-3800 Fax: (907) 786-3816

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APPENDIX I

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

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

Scientific Name	Common Name	Approx Length at Birth (cm)	Approx "NEONATE" length (cm)	Approx Length at 1 Year of Age (cm)	Approx Length at 2 Years of Age (cm)	Approx. Age at Weaning (yrs)	Approx Length at Weaning (cm)	Aprox. Adult Length (cm)	Typical Group Size	Freq. of Occur. Single Individuals
Phocoenoides dalli	Dall's Porpoise	100	100			0.3-2.0		180-220	2-12	uncommon
Physeter macrocephalus	Sperm Whale	400	350-500		670	2+	670	1100-1300 F 1500-1800 M	20-40 (50)	adult males
Pseudorca crassidens	False Killer Whale	160	170-200			1.5-2.0		500 F 550-600 M	10-20+	rare
Stenella attenuata	Pantropical Spotted Dolphin	85	80-100	129-142		1-2	140	120	<100 to thousands	uncommon
Stenella clymene	Clymene Dolphin							180-200	1-50	occasional
Stenella coeruleoalba	Striped Dolphin	93-100	100	166	180		170	220-260	10-100s	uncommon
Stenella frontalis	Atlantic Spotted Dolphin	100	80-120				140	200-230	1-15	uncommon
Stenella longirostris	Spinner Dolphin	76-77	70-80	133-137		1-2		180-220	up to thousands	uncommon
Steno bredanensis	Rough-toothed Dolphin	100						240-270	10-20	uncommon
Tursiops truncatus	Bottlenose Dolphin	117	100-130	170-200	170-225	1.5-2.0	225	220-300 (coastal) 250-650 (offshore)	2-15	occasional
Ziphius cavirostris	Cuvier's Beaked Whale	270	200-300					670 - 700	1-7	not uncommon

Pinniped – Species Specific Developmental Stages (Age-Length) and Pupping Information

Scientific Name	Common Name	Approx Length at Birth (cm)	Approx "NEONATE" length (cm)	Approx. Age at Weaning	Approx Length at Weaning (cm)	Approx. Adult Length (cm)	Pups Born	Peak of Pupping
Arctocephalus townsendi	Guadalupe Fur Seal	60	60	9-11 months		140-170 F 180-240 M	June	June
Callorhinus ursinus	Northern Fur Seal	60-65	60	3-4 months		100-150 F 190-230 M	June-July	June-July
Cystophora cristata	Hooded Seal	90-100	90-110	4-12 days		200-230 F 230-290 M	Late March	Late March
Erignathus barbatus	Bearded Seal	130	130	12-18 days	150	210-250	Mid-October to Mid-November	End of October
Eumetopias jubatus	Steller Sea Lion	100	100	Within 1 yr	180	220-290 F 240-330 M	Mid-May to Mid-June	Mid-June
Halichoerus grypus	Gray Seal	90-110	80-110	16-21 days	110	180-210 F 220-250 M	January-February	January
Histriophoca fasciata	Ribbon Seal	80-90	80-90	3-4 weeks	90-110	150-180	April-May	Early April
Mirounga angustirostris	Northern Elephant Seal	125	120-140	28 days	150	200-320 F 380-410 M	January	End of January
Monachus schauinslandi	Hawaiian Monk Seal	100	100	3-7 weeks	100	230-240 F 210-220 M	December-August	March- May
Odobenus rosmarus	Walrus	100-120	100-140	2+ years	200	230-260 F 270-320 M	April-June	May
Pagophilus groenlandicus	Harp Seal	85	80-110	12 days	100	160-190	February-March	March
Phoca larga	Spotted Seal	77-92	80-90	4-6 weeks	110	160-170	Early April-Early May	Early April
Phoca vitulina	Harbor Seal	70-100	70-90	3-6 weeks	90	150-190	May-June	May
Pusa hispida	Ringed Seal	60-65	60-70	6-8 weeks	80	120-150	Mid-March to Mid-April	Early April
Zalophus californianus	California Sea Lion	75	70	10-12 months		150-200 F 200-240 M	June	June

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APPENDIX J

"Recommended" Standard Checklist to Determine Release Category of all Rehabilitated Cetaceans

Yes = true statement, No= untrue statement (shaded areas may not be applicable)

	Release Determination Assessment (within 2 weeks of release)		Pre-Release Assessment (within 72 hours of release)	
History	**Yes**	**No**	**Yes**	**No**
1. The release candidate has NOT previously stranded				
2. Stranding was NOT associated with a Marine Mammal Unusual Mortality Event or ongoing epidemic				
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. Stranding was NOT associated with an El Niño event				
6. The animal is NOT evidence or part of a human interaction or criminal case				
7. Stranding was NOT associated with a mass stranding				
8. The animal was NOT part of a "permitted" research project				
Developmental Stage				
9. The release candidate is of sufficient size and age to be nutritionally dependent				
10. The release candidate is NOT a female with calf				
11. The release candidate is NOT a geriatric animal and is NOT compromised due to age related conditions.				
12. There is NO evidence that the release candidate was exposed to terrestrial wild or domestic animals prior to and during rehabilitation				
Behavioral Clearance				
13. The release candidate demonstrates appropriate breathing, swimming, and diving				
14. The release candidate does NOT exhibit aberrant behavior including attraction to or desensitization to the presence of humans				
15. The release candidate does NOT exhibit auditory or visual dysfunction				
16. The release candidate demonstrates appropriate foraging ability				
17. The release candidate did NOT strand as a direct result of a failure to avoid predators				

	Release Determination Assessment (within 2 weeks of release)		Pre-Release Assessment (within 72 hours of release)	
Behavioral Clearance (continued)	**Yes**	**No**	**Yes**	**No**
18. The release candidate did NOT strand as a result of taking food from humans in the wild				
19. The release candidate did NOT strand as a direct result of a demonstrated inability to obtain sufficient food in the wild				
20. The release candidate did NOT strand as a direct result of a conspecifics injury				
Medical Clearance				
21. The attending veterinarian has reviewed the release candidate's history and medical records, including records from other facilities that have previously held the animal.				
22. The attending veterinarian has examined the release candidate within two weeks of release				
23. The required health screen and assessments were conducted with good results				
24. Hands-on physical exam to be performed by attending veterinarian within 72 hours of release				
25. NO congenital defects				
26. CBC compatible with good health				
27. Chemistry profile compatible with good health				
28. Serum banked upon admission and prior to release (3 ml)				
29. Additional testing requested and reviewed by NMFS and no apparent concerns				
30. Free of drugs (exclusive of sedatives used for transport) minimum of 2 weeks prior to release				
31. Veterinarian's signature on health statement				

Health Statement

I have examined the cetacean (Species and ID#)_____on (Date)_____and have determined that the animal is medically and behaviorally suitable for release in accordance with the release criteria in that the animal will not pose a risk to the wild population and is likely to survive upon reintroduction to the wild.

_____ _____

Signature of the Attending Veterinarian *Printed Name of the Attending Veterinarian*

_____ _____

Signature of the Authorized Representative *Printed Name of the Authorized Representative*

"Recommended" Standard Checklist to Determine Release Category of all Rehabilitated Pinnipeds (except walrus)

Yes = true statement, No= untrue statement (shaded areas may not be applicable)

	Release Determination Assessment (within 2 weeks of release)		Pre-Release Assessment (within 72 hours of release)	
History	**Yes**	**No**	**Yes**	**No**
1. The release candidate has NOT previously stranded				
2. Stranding was NOT associated with a Marine Mammal Unusual Mortality Event or ongoing epidemic				
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. Stranding was NOT associated with an El Niño event				
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 animal is NOT evidence or part of a human interaction or criminal case				
9. The animal was NOT part of a "permitted" research project				
Developmental Stage				
10. The release candidate is weaned, and has a proven ability to feed itself				
11. The release candidate is sufficiently robust, having adequate reserves to survive readjustment in the wild				
12. The release candidate shows no sign of molt				
Behavioral Clearance				
13. The release candidate demonstrates appropriate breathing, swimming, diving, and locomotion on land				
14. The release candidate demonstrates an absence of aberrant behavior including attraction to or desensitization to the presence of humans				
15. The release candidate does NOT exhibit auditory or visual dysfunction				

	Release Determination Assessment (within 2 weeks of release)		Pre-Release Assessment (within 72 hours of release)	
Behavioral Clearance (continued)	**Yes**	**No**	**Yes**	**No**
16. The release candidate demonstrates a capacity to chase and capture live prey				
Medical Clearance				
17. The attending veterinarian has reviewed the release candidate's history and medical records, including records from other facilities that have previously held the animal.				
18. The attending veterinarian has examined the release candidate within two weeks of release				
19. The required health screen and assessments were conducted with good results				
20. Hands-on physical exam to be performed by attending veterinarian within 72 hours of release				
21. NO congenital defects				
22. NO nonfunctional or damaged appendages				
23. NO defects in vision				
24. CBC compatible with good health				
25. Chemistry profile compatible with good health				
26. Serum banked upon admission and prior to release (3 ml)				
27. Additional testing requested and reviewed by NMFS and no apparent concerns				
28. Free of drugs (exclusive of sedatives used for transport) minimum of 2 weeks prior to release				
29. Veterinarian's signature on health statement				

Health Statement

I have examined the pinniped (Species and ID#)_____on (Date)_____and have determined that the animal is medically and behaviorally suitable for release in accordance with the release criteria in that the animal will not pose a risk to the wild population and is likely to survive upon reintroduction to the wild.

_____ _____

Signature of the Attending Veterinarian *Printed Name of the Attending Veterinarian*

_____ _____

Signature of the Authorized Representative *Printed Name of the Authorized Representative*

NATIONAL MARINE FISHERIES SERVICE (NMFS) CRITERIA FOR DISENTANGLEMENT ROLES AND TRAINING LEVELS

Levels of Participation in the Disentanglement Network – Definitions

Roles	Levels
First Responder	1-5
Primary First Responders	3-5
Primary Disentanglers	4-5

First Responder is a general term that is used to describe anyone in the Network with any level of training who may respond to an entanglement report under Network protocols and authorization. At a minimum they will voluntarily attempt to standby with an entangled whale and, depending on training, experience, authorization and equipment available, may also assess and perhaps tag the whale. Individuals with higher Network ratings (Levels 3-5) may act as **Primary First Responders** in local areas. Primary First Responders direct efforts locally and, under certain conditions and authorization, may attempt disentanglements during first response. These individuals have rapid access to vessels and specialized equipment. Additionally, Primary First Responders are on call full-time or at least during those times when there is a high likelihood of an entanglement report in their area of responsibility.

A First Responder's anticipated range of tasks is generally dependent on their classification in the Network. Classifications to various levels are determined on an individual basis and are based on a number of factors including, but not limited to the following:

- Preexisting experience and skills
- Willingness and commitment to build experience and improve skills
- Training
- Opportunity and available resources
- Location
- Commitment to being “on-call”
- Commitment to respond as needed

Primary Disentanglers are individuals who can perform all of the responsibilities of a first responder, but who also meet the criteria used by NMFS for selecting individuals who may undertake the very dangerous activity of disentangling (i.e. attaching to, stopping and cutting a whale free). Primary Disentanglers must have the experience, training, support and proper equipment at the time of the event to conduct a full disentanglement with a high likelihood of success. Primary Disentanglers are those rated at Level 4-5 in the Disentanglement Network. A summary of the various levels of certification follows.

DISENTANGLEMENT NETWORK CERTIFICATION

LEVEL 1

Targeted Individuals: Professional mariners (*i.e.* fishermen, naturalists, Marine Patrol Officers) Boating experience and/or experience around whales is highly suggested (*i.e.* professional fishing, field biology, marine law enforcement, whale watching, etc.)

Responsibilities

Level 1 activities: report, standby, and assess (within experience)

- Rapidly alert Disentanglement Network of first-hand and/or second-hand knowledge of local entanglements
- Depending on experience, stand by an entangled whale until backup arrives, and/or
- Communicate with crew on the vessel that is directly standing by the entangled whale and offer to replace the stand by vessel until additional backup or the response team arrives (if needed and within experience)

Criteria for certification

- Completed Level 1 classroom training, or
- Viewed Provincetown Center for Coastal Studies (PCCS) Training Video and demonstrated equivalent knowledge and experience (submit resume)

LEVEL 2

Targeted Individuals: Professional mariners (*i.e.* fishermen, naturalists, Marine Patrol Officers). There is a higher expectation of commitment and participation from Level 2 responders.

Responsibilities

Level 2 activities: report, stand by, and assess at a higher level (within experience)

- Provide a thorough assessment of the nature of the entanglement and the species, condition and behavior of the whale
- Provide local knowledge, transportation, and assistance to Primary First Responders, as needed, on a voluntary basis
- Be on call, as available, to assist in planned disentanglement operations on telemetry tagged whales

Criteria for certification

Level 1 certification in addition to the following:

- Completed Level 2 on-water training, or
- Viewed PCCS Training Video and demonstrated equivalent knowledge and experience (submit resume)

LEVEL 3

Targeted Individuals: Whale researchers and naturalists, fishermen, natural resource agency personnel, Marine Patrol Officers.

Responsibilities

Level 3 activities- report, stand by, assess, document and attach a telemetry buoy. Other activities may include:

- Be on call 24 hours and should respond if conditions allow
- Initiate and maintain preparedness with local fishing industry, Coast Guard, and other resources
- Prepare local disentanglement action plan
- Provide entanglement assessment, documentation and recommendations to Primary
- Disentanglers during events
- Attach telemetry equipment to entangling gear if needed and authorized
- May be asked (depending on experience) to disentangle a minor entanglement with potential to adversely affect any whale other than right whales under the supervision/authorization of

Level 4 or 5 network members. Authorization and supervision may be given over the phone or radio depending on the circumstances and level of experience.

Criteria for certification

Level 1 and 2 certification and experience in the following elements:

- Large whale species identification and behavior, and the ability to safely follow a free swimming, entangled whale
- Boat handling and safety including basic seamanship, driving, and close approaches to whales
- Line handling and safety including knowledge of knots, handling lines under pressure, and an understanding of how working lines behave
- Follows instructions and response plans

Note: Each candidate will be evaluated for each element and any deficiencies must be supplemented with adequate training and/or experience.

Additionally, all Level 3 responders must have:

- Basic Level 3 training, or
- Advanced Level 3 training - an apprenticeship with PCCS

LEVEL 4

Targeted Individuals: Whale researchers and naturalists, fishermen, natural resource agency personnel, Marine Patrol Officers.

Responsibilities

Level 4 activities-

- Report, stand by, assess, document, attach a telemetry buoy, consult on an action plan and disentangle all large whales except right whales
- Report, stand by, assess, document and attach a telemetry buoy to right whales
- On a case by case basis and after consultation (see commitment to consult under Level 5 below), certain cuts on known entangled right whales may be permitted at level 4 ***if the proposed action is first approved by level 5 disentanglers and NMFS***

Please Note: Entangled whale behavior varies considerably by species. However, Level 4 Disentanglers should routinely be able to attempt disentanglement of all large whales other than right whales.

Criteria for certification

Basic or Advanced Level 3 Certification and:

- Direct experience in a supervised (by PCCS/Network coordinators or NMFS) large whale disentanglement, documentation of that experience, and a positive evaluation from NMFS using information provided by PCCS/Network Coordinators and any hard documentation (*i.e.* video)
- When possible, commitment to consultation as detailed in Level 5 below

LEVEL 5

Targeted Individuals: Level 4 Responders

Responsibilities

Level 5 activities - report, stand by, assess, document, attach a telemetry buoy, consult on an action plan and disentangle all large whales including right whales.

Please Note: Right whales are aggressive and therefore generally the most difficult whales to disentangle. North Atlantic right whales are among the most critically endangered large whales in the world. Certification at this level is highly selective and specialized.

Criteria for certification

Level 4 certification and:

- Experience w/ right whale behavior and/or includes a person on the team directly involved in the whale disentanglement (in the boat with the whale) that is experienced in right whale behavior
- Documented participation in a right whale disentanglement and/or NMFS/PCCS review of video of participation in a right whale disentanglement that followed NMFS protocol
- Commitment to Consultation to include:

- Immediate Consultation: when possible, use satellite/cell phones to bring in additional ideas/experience from other level 5s and level 4s (and vets and behaviorists if appropriate) while on scene with an entangled right whale
- Action Plan Development: For a tagged right whale, consultation required with NMFS, level 5s and 4s, veterinarians, behaviorists, etc.

Rationale for consultation: First assessments and strategies almost invariably change with more discussion or information. Consultation will likely help to increase human safety and critical choices regarding risks to whale health must be made with the best available information.

Best Practices for Marine Mammal Response, Rehabilitation, and Release

Glossary of Terms

Animal Care Supervisor– Responsible for overseeing prescribed treatments, maintaining hospital equipment, and controlling drug supplies. The person should be adequately trained to deal with emergencies until the veterinarian arrives, be able to direct the restraint of the animals, be responsible for administration of post-surgical care, and be skilled in maintaining appropriate medical records. It is important that the animal care supervisor should communicate frequently and directly with the attending veterinarian to ensure that there is a timely transfer of accurate information about medical issues.

Assessment Team – The team of individuals who collectively assess the rehabilitation case and make a release determination recommendation. This team could include the attending veterinarian, lead animal care supervisor, and/or consulting biologist with knowledge of species behavior and life history).

Attending Veterinarian - U.S. licensed veterinarian [i.e., graduated from a veterinary school accredited by the American Veterinary Medical Association Council on Education, or has a certificate by the American Veterinary Graduates Association's Education Commission for Foreign Veterinary Graduates or has received equivalent formal education as determined by NMFS Administrator (adapted from the Animal Welfare Act Regulations 9 CFR Ch. 1)] who has the responsibility to oversee veterinary medical aspects of live animal care and is also responsible for assuring the health of marine mammals released back to the wild following rehabilitation.

Authorized Representative- Individual with signatory authority for the stranding organization. This individual may be the signatory of the stranding agreement (e.g., Executive Director, President, CEO, etc.).

Bite - An injury from an animal that results in a break in the skin (epidermis).

Cohorts- Belonging to same species.

Conspecifics- Belonging to same species.

Diseases of Public Health and Safety Concern- Diseases that have been identified by Federal and State agencies (e.g., Centers for Disease Control and Prevention and state public health agencies) that pose a significant risk to public health.

Diseases of Zoonotic Concern- Diseases that are transmitted from animals to humans.

Ecological Status- A concept to consider when making release determinations. 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

Emerging Diseases- Newly recognized serious disease, the cause of which may or may not yet be established, that has the potential to spread within and between populations.

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 (similar to epidemic and term typically used in for animals)

ESA- Endangered Species Act

Ethogram- A catalogue of the discrete behaviors typically employed by a species. These behaviors are sufficiently stereotyped that an observer may record the number of such acts, or the amount of time engaged in the behaviors in a period of time.

FWC – Florida Fish and Wildlife Conservation Commission

FWS (U.S. Fish and Wildlife Service) - The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

FWS Division of Management Authority (DMA)- The Division of Management Authority implements domestic laws and international treaties to promote long term conservation of global fish and wildlife resources. In response to ever-increasing global pressures of wildlife trade and habitat loss on species worldwide, the office dedicates its efforts to conserving species at risk through trade and implementing policies that have a broad impact on conservation overall.

FWS Field Offices- The program operations of the FWS are performed at various types of field installations within FWS Regional Offices. The FWS Field Offices that are involved with health and stranding of marine mammals under jurisdiction of the FWS are identified in Appendix H.

FWS Letter of Authorization (LOA) - LOAs are issued by the FWS Division of Management to authorize under a "permit" network individuals, facilities, and agencies to rescue, rehabilitate, and release species under their jurisdiction that are in need of assistance. Authorizations and requirements are specific to the species, the organization, and the activity being conducted.

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- Physical signs or evidence (e.g., wounds, marks, gear, etc.) of direct human associated interaction that may or may not be related to the stranding.

Key Personnel – Individuals who represent the stranding organization and serve in key positions such as the authorized representative, primary responder, animal care supervisor, and attending veterinarian.

Letter of Concurrence from the NMFS Regional Administrator (RA) - The official notification from the NMFS regional office that concurs with the release determination recommendation.

Letter of Intent- A letter from a prospective permanent care facility requesting custody of a non-releasable animal. This letter must be sent to the NMFS Office of Protected Resources, Permits, Conservation and Education Division (http://www.nmfs.noaa.gov/pr/permits/mmpa_permits.htm).

MMPA- Marine Mammal Protection Act

MMPA/ESA Permit No. 932-1489-09- A permit issued by the NMFS Office of Protected Resources, Permits, Conservation and Education Division to the Marine Mammal Health and Stranding Response Program (MMHSRP). The permit covers some of the MMHSRP's activities, including emergency response activities for threatened and endangered species, large whale disentanglement activities, health assessment studies, and other research projects.

Marine Mammal Unusual Mortality Event- A stranding that is unexpected, involves a significant die-off of any marine mammal population, and demands immediate response.

Necropsy Team Leader- A NMFS approved team leader, responsible for all aspects of the necropsy. The Necropsy Team Leader assigns task during the necropsy and is responsible for the gross report and final necropsy report.

NMFS- National Marine Fisheries Service

NMFS National Stranding Coordinator- Develops national policy and guidance and oversees the national marine mammal stranding program (part of the NMFS Marine Mammal Health and Stranding Response Program)

NMFS Office Director- Office Director for the National Marine Fisheries Service, Office of Protected Resources

NMFS PR1- NMFS Office of Protected Resources, Permits, Conservation and Education Division

NMFS Regional Director- Regional Administrator for the National Marine Fisheries Service Regional Office (regional specific)

NMFS Regional Stranding Coordinator- Coordinates administration of the stranding program within the region.

NMFS Stranding Agreement- The official written agreement between NMFS and Stranding Network Participant as allowed under section 112(c) of the Marine Mammal Protection Act.

Primary Responder – Oversees all aspects of each stranding response and be on-site or supervising when live or dead animals are being examined or handled (i.e., paid staff and unpaid staff). If working with live animals, be in direct contact with the attending veterinarian if necessary.

Panmictic- Referring to unstructured populations (random mating).

Pre-Release Health Screen- Required to be completed prior to release of animals following rehabilitation in accordance with these guidelines

Reasonable Social Group- Refers to in association with conspecifics of similar age, sex, and/or relatedness as would be found in social groups observed in the wild.

Release Determination Recommendation- The official written recommendation for release or non release signed by the attending veterinarian and signatory rehabilitation facility and sent to the NMFS Regional Director.

Release Plan- If release is recommended and NMFS concurs, the release plan will include a timeline, release site, method of transport and tagging/post release monitoring. Conditional releases will require an expanded release plan 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.

Reportable Diseases- Diseases that pose a significant concern to public health, agriculture, and marine mammal populations and are required to be reported to NMFS and state agencies.

Responsible Party of Record- This is the official who has the legal authority to make acquisition and disposition decisions on behalf of an organization, institution, or agency that is holding marine mammals in captivity. This person's signature is required on the Letter of Intent to permanently retain or acquire a nonreleasable animal.

Signatory- The individual who signed the official stranding agreement between the stranding organization and NMFS (e.g., Executive Director, President, CEO).

Stranding Network Participant - A nongovernmental entity authorized by an agreement (Stranding Agreement) with NMFS to respond to stranded marine mammals under section 112(c) of the Marine Mammal Protection Act, which provides special exemption from the take prohibition.

Sub Designee- An entity acting under the authority and oversight of the Stranding Network Participant.

Surveillance Program- A method of surveillance that generates a source of information on the animal health status of populations.

Transfer Authorization Letter- The letter issued by NMFS PR1 to the receiving facility which authorizes retention or acquisition of a marine mammal that has been deemed nonreleasable.

USGS – United States Geological Survey

Working Group on Marine Mammal Unusual Mortality Events- An official panel of scientific experts established by the Marine Mammal Protection Act to who advise the NMFS and FWS regarding unusual mortality events.

109(h) Stranding Participant- State or local government official who can respond to a stranded marine mammal for the protection or welfare of the marine mammal and protection of public health and welfare during the course of their official duties. Section 109(h) of the Marine Mammal Protection Act provides special exemption from the take prohibition.

Zoonotic- Diseases caused by infectious agents that can be transmitted between (*or are shared by*) animals and humans.

Appendix B
Recent/Ongoing MMHSRP Research Studies, 2009-2014

1. Bottlenose Dolphin Georgia Health Assessments 2009
PI/CI: Teri Rowles/Lori Schwacke

Background/Reason for Study

The Turtle/Brunswick River estuary (TBRE) near Brunswick, Georgia provides habitat for a resident stock of bottlenose dolphin (*Tursiops truncatus*). There is concern for the health of dolphins in this area due to elevated levels of polychlorinated biphenyls (PCBs), mercury and other contaminants which have been reported in soil, sediments, and biota. The contaminant exposure of dolphins within the Sapelo Island National Estuarine Research Reserve (SINERR) is also of interest given the close proximity of this relatively pristine estuary to the highly contaminated TBRE and the potential range of movements for bottlenose dolphins and their prey.

NOAA, in collaboration with other partners, initiated efforts in 2004 to characterize chemical contaminant exposures of bottlenose dolphins in relation to pollutant sources along the Georgia coast and to investigate potential impacts on dolphin communities and more broadly, the coastal ecosystems of which they are a part. Efforts initially focused on bottlenose dolphins in the TBRE but were later expanded to the SINERR in coordination with ecological assessment activities being conducted under the Oceans and Human Health Initiative (OHHI).

Dart biopsy sampling was used to collect dolphin tissues for determination of chemical contaminant concentrations and photo-identification (id) surveys were initiated to develop a preliminary characterization of dolphin communities. Preliminary analysis of biopsy samples indicates extremely high concentrations of PCBs in dolphins from the TBRE site. PCB concentrations measured in dolphins in the SINERR site were low compared to TBRE dolphins, but still higher than values seen in dolphins from other mid-Atlantic coastal sites.

The photo-id study (initiated in 2008) has also contributed several important preliminary observations. First, although some dolphins do move between the TBRE and the SINERR sites, there appear to be "resident" communities at both sites, *i.e.*, a number of individuals which are exclusively sighted at each site. Furthermore, integration of preliminary sighting histories and contaminant data has shown significant variation in PCB concentrations and congener patterns in relation to residence and movements.

Objectives

To investigate the potential adverse impacts of the PCB exposures on dolphins by comprehensively evaluating dolphin health through targeted sample collection. Additionally attachment of telemetry tags was conducted to facilitate tracking of individual dolphins to understand dolphin movements, behavior, and habitat preferences to help to define potential conservation strategies and to develop ideas for restoration projects.

Sample Size

Sample size was determined based upon field conditions (water depth, distance to prime dolphin habitat, weather concerns, etc.) and the capture period. Approximately 3 dolphins per day were estimated to be able to be safely captured based upon field conditions, with a proposed sample size of 30 dolphins for the 2 week period (15 dolphins from each capture site TBRE and SINERR).

Results

Fourteen animals were captured, examined, and released from the SINERR site during week 1. During week 2, 15 animals were captured, examined, and released from the TBRE site. Animals were also tagged with VHF radio tags and tracked over a several month period in order to learn more about habitat use and range of movements.

TBRE males had the highest concentrations of PCBs reported for any marine mammal. The pattern of PCB congeners was consistent with Aroclor 1268, a highly chlorinated PCB mixture associated with a Superfund site in Brunswick. PCB levels in SINERR males were lower than in TBRE males, but comparable to the highest levels measured in other dolphin populations along the southeastern U.S. Female dolphins had higher Aroclor 1268 proportions than males, suggesting that the highly chlorinated congeners associated with Aroclor 1268 may not be offloaded through parturition and lactation as easily as less halogenated POPs. Individuals sighted farther from the Superfund point source had lower Aroclor 1268 proportions.

Dolphin densities increased with tributary size in both sites but dolphin density and total abundance were significantly higher in SINERR than in TBRE. Anthropogenic stressors within the TBRE may be an important factor contributing to the differences in abundance, density, and habitat use observed in this study.

More detailed results are outlined in the below manuscripts.

Balmer, B. C., L. H. Schwacke, R. S. Wells, J. D. Adams, R. C. George, S. M. Lane, W. A. McLellan, P. E. Rosel, K. Sparks, T. Speakman, E. S. Zolman, and D. A. Pabst. 2013. Comparison of abundanceand habitat usage for common bottlenose dolphins between si tes exposed to differential anthropogenic stressors within theestuaries of southern Georgia, U.S.A. Marine Mammal Science 29: E114-E135.

Balmer, B. C., R. S. Wells, L. H. Schwacke, T. K. Rowles, C. Hunter, E. S. Zolman, F. I. Townsend, B. Danielson, A. J. Westgate, W. A. McLellan, and D. A. Pabst. 2011. Evaluation of a single-pin, satellite-linked transmitter deployed on bottlenose dolphins (*Tursiops truncatus*) along the coast of Georgia, U.S.A. Aquatic Mammals 37:187-192.

Balmer, B. C., L. H. Schwacke, R. S. Wells, R. C. George, J. Hoguet, J. R. Kucklick, S. M. Lane, A. Martinez, W. A. McLellan, P. E. Rosel, T. K. Rowles, K. Sparks, T. Speakman, E. S. Zolman, and D. A. Pabst. 2011. Relationship between persistent organic pollutants (POPs) and ranging patterns in common bottlenose dolphins (*Tursiops truncatus*) from coastal Georgia, USA. Science of the Total Environment 409: 2094-2101.

2. Bottlenose Dolphin Barataria Bay, Louisiana (2011, 2013, 2014) and Mississippi Sound, Mississippi (2013) Health Assessments

PI/CI: Teri Rowles/Lori Schwacke

Background/Reason for Study

Natural Resource Damage Assessment (NRDA) pre-assessment efforts documented oil exposure of bottlenose dolphin (*Tursiops truncatus*) stocks in Barataria Bay, Chandeleur Sound and Mississippi Sound. Dolphins were observed in oiled areas and some dolphins were observed with oil patches on their skin. No overt signs of distress were observed in association with oil exposure. However, possible potential sublethal or latent effects, such as organ damage and immune dysfunction, would not be detectable by the photographic and remote biopsy studies conducted to date. In addition to the possible chronic health effects from acute exposure, the dolphins may also be subject to adverse effects if oil and associated chemicals persist in the marine environment, including the marine food web. Other indirect impacts from potential habitat degradation and loss of prey resources are also of concern and may reduce survival and reproduction over the longer term. Such effects have potential to impact the sustainability of stocks or communities.

Objectives

This project conducted capture-release health assessments of bottlenose dolphins in two impacted areas (Barataria Bay, LA -2011, 2013, 2014), and (Mississippi Sound, MS-2013), and a reference site (Sarasota Bay, FL-2011, 2013 –samples collected under NMFS permit 15543) to address potential sublethal, chronic, and indirect health impacts of the Deepwater Horizon (DWH) oil spill and provided information on the health of these populations that are also part of an Unusual Mortality Event. The health assessments enabled researchers to directly assess potential injury endpoints (anemia, organ damage, immune suppression, endocrine disruption, indication of nutritional and chronic stress). Additionally, the capture-release operation allowed for attachment of satellite and VHF tags to dolphins in Barataria Bay to better understand their movements, range and preferred habitats, which may assist in exposure assessment and restoration planning.

Sample Size

Sample size was determined based upon field conditions (water depth, distance to prime dolphin habitat, weather concerns, etc.) and the capture period. Approximately 3 dolphins per day were planned/estimated to be able to be safely captured based upon field conditions, with a proposed sample size of 30 dolphins for the 2 week period for each impacted capture location (LA, MS) and 15 dolphins for a 1 week period for the control site (FL) per year.

Results

In 2011, 32 dolphins were temporarily captured and assessed in Barataria Bay. Twenty-six dolphins were tagged with either radio and/or satellite-linked tags to learn more about habitat use and range of movements.

In 2013, 31 dolphins were temporarily captured and assessed in Barataria Bay. Eight animals were tagged with satellite-linked tags. Twenty dolphins were temporarily captured and assessed in Mississippi Sound. Nineteen were tagged with satellite-linked tags.

In 2014, 32 dolphins were temporarily captured and assessed in Barataria Bay. Eleven animals were tagged with satellite-linked tags.

Dolphins sampled from 2011 in Barataria Bay showed evidence of hypoadrenocorticism, consistent with adrenal toxicity as previously reported for laboratory mammals exposed to oil.

Barataria Bay dolphins were 5 times more likely to have moderate–severe lung disease, generally characterized by significant alveolar interstitial syndrome, lung masses, and pulmonary consolidation. Of 29 dolphins evaluated from Barataria Bay, 48% were given a guarded or worse prognosis, and 17% were considered poor or grave, indicating that they were not expected to survive. Disease conditions in Barataria Bay dolphins were significantly greater in prevalence and severity than those in Sarasota Bay dolphins, as well as those previously reported in other wild dolphin populations. Many disease conditions observed in Barataria Bay dolphins are uncommon but consistent with petroleum hydrocarbon exposure and toxicity. Results from the 2013 and 2014 captures are still undergoing analyses.

More results are detailed in the below manuscript.

Schwacke, L. H., C. R. Smith, F. I. Townsend, R. S. Wells, L. B. Hart, B. C. Balmer, T. K. Collier, S. DeGuise, M. M. Fry, L. J. Guillette, S. V. Lamb, S. M. Lane, W. E. McFee, N. J. Place, M. C. Tumlin, G. M. Ylitalo, E. S. Zolman, and T. K. Rowles. 2014. Health of Common Bottlenose Dolphins (*Tursiops truncatus*) in Barataria Bay, Louisiana, Following the Deepwater Horizon Oil Spill. Environmental Science and Technology 48: 93-103.

3. Cetacean Auditory Evoke Potentials (AEP) in the Northeast and GOM (2010, 2011,2013)
PI/CI: Teri Rowles/Katie Touhey Moore (IFAW)

Background/Reason for Study

Auditory Evoked Potential (AEP) procedures may be conducted as a method to evaluate the hearing abilities of individual animals or species (Nachtigall *et al.* 2007, Mulsow *et al.* 2012). Procedures may be conducted on stranded animals, animals in rehabilitation, or on animals captured during research studies. Currently little is known about the hearing abilities of non-bottlenose dolphin odontocete species. Live stranding response, especially live mass stranding response allowed for the testing of multiple odontocete species during the response and relocation/release process. All AEP procedures performed on stranded and rehabilitating odontocetes followed NMFS PR1 policies and protocols. Testing did not delay treatment, movement, or release of a stranded animal nor did it interfere with rehabilitation activities. It is considered best practice to conduct AEP on cetacean release candidates to assess suitability for release. Testing was stopped if an animal exhibited any adverse reaction, including abnormal respiration and locomotion, vocalization, vomiting, or other signs of distress.

Objectives

To gather baseline data on hearing abilities of stranded and live capture-release odontocetes, including bottlenose dolphins. This baseline data helped with on-scene release decisions for future stranding events and provides valuable data for cross-population comparisons of live-capture release bottlenose dolphins.

Sample Size

Sample size was opportunistic based upon the number of live stranding events per year. Additionally, sample size for live-capture release projects was determined by the PIs of those projects and AEPs were attempted on as many animals as were allowed based upon animal condition and other sampling concerns.

Result

In 2010 AEP testing was conducted on eight cetaceans including five common dolphins, two Atlantic white-sided dolphins, and one harbor porpoise. In 2011 AEP testing was conducted on eight cetaceans including two common dolphins, four Atlantic white-sided dolphins, one bottlenose dolphin, and one harbor porpoise. In 2013 AEP testing was conducted on 61 small odontocetes including twenty five animals (22 common dolphins, two Atlantic white-sided dolphins and one bottlenose dolphin) that were tested on Cape Cod, MA during stranding response efforts. Two harbor porpoises (one captive female and one juvenile male that stranded and was in rehabilitation) in Vancouver, British Columbia, Canada were tested at the request of their veterinarian, Dr. Martin Haulena. Nine bottlenose dolphins were tested during captures with the Sarasota Dolphin Research Project in Sarasota, FL as a means of not only gathering data, but also in preparation for similar captures in the Gulf of Mexico to ensure proper functioning within the larger team effort. Twenty five bottlenose dolphins were tested in Barataria Bay, LA during the NRDA Barataria Bay bottlenose dolphin health assessments.

In 2010, five of the cetaceans that were given AEP tests were healthy stranded animals that were then relocated and released according to standard IFAW protocol. Two of these animals were released with satellite TDR tags, VHF tags, and Roto Tags. The remaining three animals were euthanized due to poor health according to standard IFAW response protocols (this decision was entirely unrelated to the AEP activity). The decision to euthanize was made on the basis of clinical and hematological tests made on the animals. There was no evidence that the AEP test directly changed the behavior of any of the eight tested animals. Preliminary analysis of the satellite tag data suggests all tagged animals survived the event. Preliminary findings from the AEP project indicate that these individuals' hearing ranges are consistent with those of other small Odontocetes. This project resulted in the first recordings for common dolphins and Atlantic white-sided dolphins.

In 2011, all eight of the cetaceans that were given AEP tests were healthy stranded animals that were then relocated and released according to standard IFAW protocol. One animal was released with a satellite TDR/VHF tag; a second received a location only satellite tag with VHF capability. Five of the remaining cetaceans were released with roto tags only, and the disentangled animal from Florida had extensive damage to the dorsal fin, preventing any tag attachment. There was no evidence that the AEP test directly changed the behavior of any of the eight tested animals. Preliminary analysis of the satellite tag data suggests all tagged animals survived the event. One roto tagged animal restranded several days later, was humanely euthanized and a necropsy was conducted. Preliminary findings from the AEP project indicate that these individuals' hearing ranges are consistent with those of other small Odontocetes.

In 2013 during AEP tests on Cape Cod and at the Vancouver Aquarium, cetacean subjects were continuously provided with supportive care (thermoregulation, foam padding, quiet conditions, etc.). These measures were very effective in minimizing the stress on the tested animals. The dolphins in Florida and Louisiana were examined under strict protocols designed for the safe capture of wild bottlenose dolphins. AEP data collection was done concurrently with other sample collection and physical examination and thus did not add to the total time the animals were held. Results of data are still pending.

4. Sperm Whale Abundance, Habitat, and Spatial Distribution of the Southeastern Gulf of Mexico 2012

PI/CI: Teri Rowles/Keith Mullin

Background/Reason for Study

This project was conducted jointly by the Bureau of Ocean Energy Management (BOEM) and NMFS Southeast Fisheries Science Center. The data will be used to support environmental assessments associated with potential offshore energy exploration projects in the southeastern Gulf of Mexico and to improve understanding of potential critical habitat areas for the endangered Northern Gulf of Mexico sperm whale population. The study area included the offshore waters along the inner continental slope off the Dry Tortugas. The effort focused on known habitat for the southeastern Gulf of Mexico sperm whale aggregation. The research was conducted onboard the NOAA Ship *Gordon Gunter* from June 7 until August 6, 2012 totaling 55 sea-days.

Objectives

The primary objective of this project was to assess the abundance, habitat and spatial distribution of sperm whales of the southeastern Gulf of Mexico by means of visual and acoustic monitoring, biopsy sampling and deployment of satellite tags.

Sample Size

Sample size was determined based upon field conditions (water depth, distance to prime sperm whale habitat, weather concerns, etc.) and the capture period. Approximately 10-20 sperm whales were predicted to be encountered and tagged during the sampling period.

Results

Throughout the cruise as weather allowed, a 7-m RHIB was deployed to conduct close approaches to sperm whales to deploy satellite telemetry tags. These were implantable tags deployed from close distance using a modified compressed air line thrower (Air Rocket Transmitter System - ARTS). The system was used to deploy two types of tag units, both developed by Wildlife Computers: 1) SPOT-5 providing ARGOS satellite-based location information and 2) MK-10A units providing ARGOS locations and summaries of dive behaviors. Close approaches to sperm whales were made on 18 days of the project and 11 tags were deployed consisting of six SPOT-5 tags and five MK-10A tags. Tagging attempts were restricted to the extreme southeastern U.S. Gulf of Mexico, an area where sperm whales have not previously been satellite tagged. An attempt to collect a biopsy sample was made simultaneously with each tagging attempt. Biopsy samples were collected under MMPA Permit 779-1633 issued to the Southeast Fisheries Science Center.

5. Prevalence of Leptospirosis in Free Ranging California Sea Lions prior to, during, and after an outbreak of leptospirosis in stranded sea lions, 2010, 2011

PI/CI: Teri Rowles/Frances Gulland

Background/Reason for Study

Since 1970, periodic outbreaks of leptospirosis, caused by pathogenic spirochetes in the genus Leptospira, have caused morbidity and mortality of California sea lions along the Pacific coast of North America. Yearly seasonal epizootics of varying magnitude occur between the months of July and December, with major epizootics occurring every 3–5 years. Genetic and serological data suggest that *Leptospira interrogans serovar Pomona* is the infecting serovar and is enzootic in the California sea lion population, although the mechanism of persistence is unknown.

Objectives

The study investigated the prevalence of susceptible and carrier animals during a disease outbreak and 2-3 months after an increase in strandings due to leptospirosis. Antibody levels in these animals were measured using a microagglutination test validated for California sea lions. The *Leptospira* carrier status of animals was determined by collecting urine for testing for presence of *Leptospira* organisms using polymerase chain analysis.

Sample Size

Sample size was determined by power analysis with an estimate of 100-120 sea lions per year needed for a 50-80% power if prevalence of disease was estimated at 20%.

Results

Blood, fecal, and urine samples from 109 animals were collected at three locations in Central California in 2010. The samples were sent for analysis to laboratories at the University of California (UC), San Francisco, UC Davis, and the National Animal Disease Center (Ames, IA). All of the animals, except one, returned to the haul out site after handling and appeared to be active and mobile within 10 minutes of release from handling. Antibodies to *Leptospira* were detected in apparently free living sea lions. Novel viruses were detected in feces of sea lions from rookeries.

Active shedding of leptospires was detected in 29 of the 85 sea lions sampled via either PCR, culture or both in 2011. Results of serological analyses are pending. These data will be used to assess whether the patterns of shedding and seroprevalence of antibodies in wild-caught sea lions reflect the patterns observed in stranded sea lions.

See the below manuscript for more details of the study.

Prager KC, DJ Greig, DP Alt, RL Galloway, RL Hornsby, LJ Palmer *et al*. 2013. Asymptomatic and chronic carriageof *Leptospira interrogans* serovar Pomona in California sea lions (*Zalophus californianus*). Veterinary Microbiology, 164: 177-183.

6. Northern Fur Seal Pribilof Islands Health Surveillance Samples 2009, 2012, 2013

PI/CI: Teri Rowles/Tom Gelatt

Background/Reason for Study

The northern fur seal population on the Pribilof Islands has been experiencing a decline in population size over the last several years. To determine if disease is having any impact on

the population, screening for a variety of pathogens has been started by the National Marine Mammal Laboratory. In addition, the recent emergence of phocine distemper virus (PDV) in the Alaska region in sea otters and other marine mammals has increased the need to collect baseline data on prevalence of pathogens, including PDV in northern fur seals.

Objectives

The objectives of this study are to collect data on fur seal health and pathogens. Blood samples are used to assess general health using serum chemistries to detect changes in specific parameters that may indicate poor health and to screen for viruses and toxins. Oral, nasal, rectal, and vaginal swabs are used to assess the presence of parasites or bacterial or viral pathogens.

Sample Size

Sample size was determined by the PI (NMML) for the studies done under their research permit, NMFS Permit No. 782-1708-05 or 14327. Swabs, etc. were collected for MMHSRP on an opportunistic basis.

Results

In 2009, vaginal swabs from 156 northern fur seals were collected on St. Paul Island and 92 vaginal swabs were taken from northern fur seals on St. George Island, AK. In September and October 2012, nasal swabs from 57 northern fur seals were collected on St. Paul Island and 24 nasal swabs were taken from seals on St. George Island, AK. In 2013, nasal swabs were collected from 30 northern fur seals on St. Paul Island.

From the samples collected in 2009, samples from 30 females from each island have been tested for *Brucella sp.*, *Chlamydia sp.*, *Leptospira sp.*, herpesvirus, and toxoplasma. The only positives tests have been for herpesvirus with 97% of the St. Paul females and 80% of the St. George females testing positive by the ELISA test. Follow up PCR testing of the positive samples was ongoing to detect and identify the virus. The ELISA results may be due to cross reactivity to a fur seal or otariid herpesvirus rather than a phocine herpesvirus. Testing of nasal swabs collected in 2012 from 23 animals was negative for PDV via PCR. Swabs from 2013 have been archived and are awaiting testing.

7. Northern Fur Seal California Channel Islands Health Surveillance Samples 2012
PI/CI: Teri Rowles/Robert Delong

Background/Reason for Study

The goals of the sampling study was to sample pups and adult female fur seals to screen the San Miguel population for diseases, specifically herpesviruses, *Coxiella burnetti*, and morbilliviruses.

Objectives

The objective was to establish baseline presence of pathogens in the population at San Miguel for comparison to Alaska populations and determine if fur seal populations could be a source population for the presence of herpesvirus in California sea lions at San Miguel Island.

Sample Size

Sample size was determined by the PI (NMML) for the studies done under their research permit, NMFS Permit No. 14327. Swabs, etc. were collected for MMHSRP on an opportunistic basis.

Results

Vaginal and nasal swabs from 30 adult northern fur seals were collected under to test for the presence of herpesviruses, *Coxiella burnetti*, and morbilliviruses. All 30 adult females were negative for *Coxiella burnetti* and for morbilliviruses, suggesting that these pathogens are not currently prevalent in the population. The results for the herpesviruses are still pending.

8. Grey and Harbor Seal Northeast Health Surveillance Samples 2012, 2013

PI/CI: Teri Rowles/Gordon Waring

Background/Reason for Study

The goal of the sampling study was to screen grey and harbor seal populations for health and disease, specifically looking at morbilliviruses and influenza virus.

Objectives

The objective was to establish baseline presence of pathogens in the grey and harbor seal populations in the northeast.

Sample Size

Sample size was determined by the PI (NEFSC) for the studies done under their research permit, NMFS Permit No.17670 or 775-1875. Swabs, etc. were collected for MMHSRP on an opportunistic basis.

Results

In 2012 samples were collected from harbor seals in Chatham, Massachusetts and Rockland, Maine. Samples were collected from 16 seals in MA and 12 seals in ME. In 2013 samples were collect from 14 grey seals in Chatham, MA. CBC and Chemistry results were within normal limits for the seals tested. Samples for pathogen testing have been archived and results from influenza testing are pending.

9. California Sea Lion Channel Islands Health Surveillance Samples 2013-2014

PI/CI: Teri Rowles/Robert Delong

Background/Reason for Study

A UME was declared for California sea lions pups in March 2013. As part of the UME investigation samples were collected from both sea lion pups and adult females starting in 2013 to screen for any pathogens that could be contributing to the UME.

Objectives

To screen California sea lion pups and adult females for pathogens that could be contributing to the 2013 CA UME. Additionally, samples will continue to be collected post-UME in 2015-2017 to determine if there is any shift in pathogen profiles, specifically for sea lion pups.

Sample Size

Sample size was determined by the PI (NMML) for the studies done under their research permit, NMFS Permit No. 782-1708-05 or 14327. Swabs, etc. were collected for MMHSRP on an opportunistic basis. In general an attempt was made to sample 30 pups per island and 10-20 adult females, when females were being sampled.

Results

In 2013, 14 adult females and their pups were sampled. In 2014, 30 pups were sampled. In 2013, astroviruses were the most commonly identified virus in the surveys from fecal swabs from pups, with a 71% prevalence in 14 live wild pups and a 59% prevalence in 44 stranded pups from the UME, with at least five different astrovirus types identified. Because of the high genetic diversity of the viruses and previously documented high prevalence of astroviruses in surveys of healthy wild and captive sea lion populations, these astroviruses are currently not believed to have caused the UME.

The following pathogens and toxins were not identified in any samples tested: *Clostridium difficile* enterotoxin, *Cryptosporidium, Giardia*, and *Lawsonia intracellularis* from fecal samples; and influenza A virus, morbillivirus, paramyxovirus, and rotavirus from nasal swab samples.

APPENDIX C
SELECTED MMHSRP PROTOCOLS

Appendix C: Selected MMHSRP Protocols

Hazing

C-1: Supporting information for the Killer Whale Section of the Northwest Wildlife Response Plan, Chapter 9970 of the NWACP (available at: http://response.restoration.noaa.gov/sites/default/files/whale_response.pdf)

Supporting Information for the Killer Whale section of the Northwest Wildlife Response Plan, Chapter 9970 of the NWACP

I. This document is intended to provide contacts and supporting information for use by spill responders when implementing or testing the Killer Whale – Monitoring and Hazing Plan for Oil Spill Response. Tables 1. thru 3. contain contact information for knowledgeable personnel and equipment. This is followed by a practicality analysis that supports the hazing method priority table contained in the Monitoring and Hazing Plan and a section that describes the general advantages and disadvantages of each hazing method.

A. Table 1: Groups or individuals who are able to identify killer whales to ecotype, pod and individual

Name	Contact Number
Cascadia Research Collective	(360) 943-7325
Center for Whale Research	(360) 378-5835
Department of Fisheries and Oceans	(250) 729-8375
Lifeforce Foundation	(604) 649-5258
Northwest Fisheries Science Center	(206) 860-3220
Whale Museum	(800) 562-8832

B. Table 2: Regional whale sighting networks

Resource	Phone Number	Contact Person
BC Cetacean Sighting Network	(866) I-SAW-ONE	
Cascadia Research Collective	(800) 747-7329 or (360) 943-7325	John Calambokidis, Erin Falcone or Robin Baird
Center for Whale Research	(360) 378-5835	Ken Balcolmb

Fisheries & Oceans Canada – British Columbia Marine Response Network	(800) 465-4336	Marine Mammal Incident Coordinator
Lifeforce Whale and Dolphin Hotline	(604) 649-5258	Peter Hamilton
Northwest Fisheries Science Center	(206) 860-3220	Brad Hanson or Dawn Noren
Orca Network	(360) 678-3451	Susan Berta or Howard Garrett
Whale Museum Sighting Hotline and acoustic array	(800) 562-8832	Jenny Akinson or Amy Traxler
Pacific Whale Watch Association	(360) 661-5830 (cell) or (360) 293-2428 (office)	Shane Aggargard, President

C. Table 3: Resources available for deterring killer whales from an oil spill

Resource	Location	Contact Name	Contact Number
Oikomi Pipes (12)	NOAA Sand Point Facility	Brent Norberg or Lynne Barre	(206) 526-6550 or (206) 526-4745
Seal Control Devices	NOAA	Brent Norberg or Lynne Barre	(206) 526-6550 or (206) 526-4745
AHDs and ADDs	NOAA	Brent Norberg or Lynne Barre	(206) 526-6550 or (206) 526-4745
44' shallow draft boat with licensed captains and capabilities for safe use 24-7 (including night vision capability and underwater speakers with onboard amplifiers)	Global Research and Rescue	Bob Wood	(206) 954-5192
27’ Pacific aluminum skiff with center console	NOAA/NWFSC, Seattle	Dawn Noren	(206) 302-2439
26’ Olympic XL boat with cabin and cockpit	SeaDoc Society, Orcas Island	Joseph Gaydos	(360) 376-3910 or (360) 914-1083
24’ ProLine center console boat	NOAA	Brent Norberg or Lynne Barre	(206) 526-6550 or (206) 526-4745

19’ SAFE Boat	Whale Museum	Jenny Akinson	(800) 562-8832
18' rigid-hulled inflatable boats (n=2)	Cascadia Research, Olympia	John Calambokidis, Erin Falcone or Robin Baird	(360) 943-7325 or (360) 280-8349
18’ Campion boat with 150 HP outboard, large open cockpit with optional full canvas camper cover.	Lifeforce Foundation, Vancouver, BC	Peter Hamilton	(604) 649-5258
Killer Whale Call Recordings	Center for Whale Research	Ken Balcomb	(360) 378-5835
Killer Whale Call Recordings	Department of Fisheries and Oceans, BC	John Ford	(250) 729-8375
Underwater Playback Systems (n=2) and Killer Whale Call Recordings	Lifeforce Foundation, Vancouver, BC	Peter Hamilton	(604) 649-5258
Numerous boats of varying size	Whale Watch Operators Association Northwest	Shane Aggargard, President	(360) 661-5830 (cell) or (360) 293-2428 (office)

D. Hazing Method Practicality Analysis

As detailed in the table below a practicality analysis of the various hazing methods considered was conducted by enumerating values for the efficacy, speed of deployment, risk of injury to the whales, level of training requirements for crews using the method, number of people required to implement the method and equipment availability. There is no one hazing technique that will work in all situations. The potential benefit of employing a technique will be a product of the current circumstances, how the technique is employed, the experience of the people employing the technique and the degree to which whales are attracted to an area. The risk of killer whale exposure to oil must be considered relative to the risk associated with hazing.

Ranked Practicality of Various Hazing Methods							
Method	**Efficacy (double score)**	**Speed**	**Risk of Injury**	**Training Requirements**	**Personnel Required**	**Equip Available**	**Total**
Oikomi Pipes	4 (8)	3	4	3	1	4	23
Seal control devices	4 (8)	3	2	2	3	4	22
Aircraft	3 (6)	4	4	0 *	4	4	22
Experimental Methods	1 (2)	2	3	3	4	3 **	18

Acoustic Deterrent Devices	1 (2)	3	4	3	2	2	16
Fire Hoses	1 (2)	3	2	2	3	3	15
Acoustic Harassment Devices	1 (2)	2	2	2	4	2	14
Vessel Traffic	1 (2)	3	2	2 ***	2	3	14
Killer Whale Calls	0 (0)	2 to 3	3 to 4	0	4	4	13 to 15
Mid-frequency sonar	3 (6)	0	2	0	0	0	8
Air guns	1 (2)	0	2	0 ****	2	0	6

***Not hazing is always an option to consider**

Key to Values in Table:

Numeric value	Assessment of efficacy	Estimated time to deploy	Risk of injury to SRKW
0	Unlikely to work on SRKW	More than 48 hrs	Previously documented injuries
1	unknown efficacy	within 48 hrs	suspected injury
2	Judged likely to work	within 24 hrs	injury if misused
3	anecdotal evidence of efficacy	within 8 hrs	injury unlikely but not well studied
4	Documented experience of efficacy	within 2 hrs	injury unlikely

Numeric value	Time required to train participants	# of people required	Equipment Availability
0	Greater than one day	More than 50	Requires 3rd party approval (Navy, City, etc.)
1	1 day training	21 to 50	High cost
2	less than 2 hours training	11 to 20	No local vendor
3	verbal instruction given at time	5 to 10	Easily purchased or available locally
4	Non -required	1 to 4	Available in stock or stored

COMMENTS
Method
Oikomi Pipes - Limited number (12) stored, but materials for fabrication are readily available
Acoustic Harassment and Deterrent Devices - None stored
Speed
Killer Whale Calls - There are limited sources for recordings
Risk of Injury
Killer Whale Calls - Limited experience indicates that response is unpredictable and possibly aggressive

Training Requirements
*Aircraft - Operation of aircraft in pursuit of wildlife requires extensive training
****Air Guns - Operation of seismic exploration equipment requires extensive training
***Vessel Traffic - Assumes vessel operators are pre-qualified to drive boats
Mid-frequency Sonar - Operation of sonar equipment requires extensive training
Personnel Required
The number of personnel required is highly dependent on the scale of the exercise and basic work unit size must be defined for each method
Equipment Available
Aircraft - Assumes that aircraft used for reconnaissance are also available for limited hazing efforts
Acoustic Deterrent Devices (Pingers) - Recommend stockpiling a supply of these locally
** Experimental Methods - Highly dependent on technique

E. Hazing Method Advantages and Disadvantages

Potential deterrent options were evaluated by Killer Whale experts and oil spill response personnel (see More Detailed Information below) and are listed with their associated positive and negative benefits to provide a range of options to be considered under the circumstances. In addition to weighing the hazing options provided, the Wildlife Branch also must consider the costs and benefits associated with taking no hazing action.

i. Close-range hazing techniques

1. Oikomi Pipes: Oikomi pipes are reverberant metal; usually a pipe with a cap on the top. A handle on the top of the pipe and a cone at the bottom of the pipe improves reverberation. When numerous pipes are used in multiple lines, they have been effective at moving killer whales at close range.
   - Advantages: Oikomi pipes have been used and are very effective at herding whales. This is safe for the whales and would have a high public acceptance level.
   - Disadvantages: This technique would be most effective for herding of animals and might not be as efficacious for keeping animals out of a very large area (such as in the middle of Juan de Fuca Strait). Deployment requires coordination of multiple vessels and could be dangerous at night or during poor sea conditions.
2. Seal control devices: These are explosive devices that put out a pulse of noise and previously were used effectively to drive whales during the live captures in Puget Sound in the 1970's.

   a. Advantages: They worked from about 1 mile away during whale captures. They are not very expensive and readily available.

b. Disadvantages: There could be concerns about using these explosive devices where highly volatile oil was located. These could cause fish mortality.

3. Acoustic Deterrent Devices (ADDs): ADDs make sound not loud enough to cause pain, but which is audible to marine mammals. ADDs are often called net pingers.

    a. Advantages: They are readily available and could be easily deployed on oil booms or vessels.

    b. Disadvantages: They may not have sufficient power to deter whales and whales may habituate quickly.

4. Killer Whale Calls: Prerecorded calls can be played from a small boat to theoretically either attract whales away from an area or deter them from entering an area.

    a. Advantages: Prerecorded calls and broadcasting equipment are readily available and could be deployed from a highly mobile small vessel. This is not dangerous to whales or other species in the area. This technique needs further study.

    b. Disadvantages: There have been no rigorous studies showing that calls will consistently cause whales to avoid or be attracted to the source. It is likely that animals could habituate to this relatively quickly.

5. Vessel Traffic: The noise and motion of boat traffic could be used drive whales from an area or deter them from entering one.

    a. Advantages: Small boats are potentially available for this activity.

    b. Disadvantages: Boats have very little value in long-range displacement of killer whales, especially the highly conditioned southern resident killer whales.

6. Aircraft: Helicopters can generate a fair amount of noise and wave movement at close range and could produce a startle or avoidance response.

    a. Advantages: This might be very effective initially because whales are not used to it. It can be quickly mobilized and could provide real-time tracking of whales. Also, it could simultaneously be used to deploy additional deterrent devices such as seal control devices.

    b. Disadvantages: There is no guarantee that helicopters will be able to control whale movement and whales would likely habituate to helicopters quickly. Because of the above-water nature of this deterrent it would affect the behavior of birds and other animals in a way that might not be beneficial (i.e. scare birds off un-oiled shorelines with the chance they will land in oiled areas). If helicopter hazing were used in combination with other hazing methods, such as launching of explosives, then this would require the development of specific safety protocols and perhaps special safety equipment such as a launcher.

7. Fire hoses: Fire hoses could be used to direct streams of water at whales on the surface at extremely close range.

a. Advantages: Boats could be equipped with pumping capacity and deployed on fairly short notice. High powered fire monitors mounted on some regional tug boats can send a stream over water over 100 yards.

b. Disadvantages: There are no data on the effectiveness of this technique and it is limited to very close range (approximate 100 yards).

8. Strobe lights, bubble curtains, booms or other experimental methods: Theoretically these could provide a visual deterrent and perhaps prevent killer whales from entering a spill.

a. Advantages: Theoretically these could be used to fence off an area without risk of physical harm to the whales.

b. Disadvantages: Light and other visual stimuli will not penetrate water very far and no data are available on effectiveness. Similarly responses to bubble curtains and booms are not quantified.

ii. Longer-range techniques

1. Acoustic Harassment Devices (AHDs): AHDs produce noise loud enough that they are likely to cause pain in animals at a certain range (ADDs are not loud enough to cause pain, but can be heard). Airmar AHDs have a source level of 195 dB re 1 μPa_{RMS} and their peak energy at 10 kHz with higher harmonics. These are used at the Ballard Locks and they could be moved at low speed from small boats or could be hull mounted on boats to allow faster movement. They are designed with 4 transducers that alternate transmission. They can be battery operated, but need a continuous power source for long-term use.

- Advantages: It would not take long to train people to use them. They may deter killer whales up to 3 km away. This would be publicly acceptable at long range because it is estimated that injury would not be likely at distances over 10 meters.

- Disadvantages: The received levels needed to cause deterrence without acoustic trauma are unknown, however it is thought that killer whales react strongly at the 135 dB re 1 μPa_{RMS} received level. Additionally, it has been suggested that repeated exposures to AHD's in the same area could result in long-term displacement of killer whales from an area.

2. Air guns: This is a mechanical device that uses air that expands and contracts to give a strong pulse under water to map earthquake faults or for oil exploration. They are frequently used in arrays to give a higher source level. Depending on the size, the peak energy can be from 10 Hz to 1 kHz, but they produce broadband pulses with energy at frequencies ranging to over 100 kHz. The higher frequencies are less intense and attenuate faster. Intensity of output is controllable by the operator to account for distance from the subject.

- Advantages: Harbor porpoise have been seen moving away from them at 70 km so they could have impacts at great distances.

- Disadvantages: Because mysticetes hear low frequencies better, there is more concern with their use around mysticetes than odontocetes. There are no data on effectiveness in deterring killer whales. These are generally a towed array that is deployed behind a ship like the University of Washington's *R/V Thomas Thompson* so securing a ship to tow the array could be an issue. Use of a single gun would not pose this problem. There is concern about acoustic impacts to killer whales and other species including fish.

3. Mid-frequency sonar: This has caused behavioral changes in killer whales in Haro Strait during the *USS Shoup* transit episode in 2003. The source level was approximately 235 dB (exact level is classified) and frequency was 2.6-3.3 kHz over 1-2 second signals emitted every 28 seconds.

    - Advantages: Mid-frequency sonar could be effective for over 25 km, which could be useful in a large spill and it can be operated at night.

    - Disadvantages: Received levels that were effective in causing a response during the USS *Shoup* incident are unknown. There are a very limited number of boats that have the capability to deploy this sonar and they are engaged in national security missions. Concerns with using sonar include the potential for acoustic trauma in killer whales and other marine mammals and a lower level of public acceptance as a deterrent device. Difficulty in limiting range makes this technique excessive for a small spill.

iii. Further Information: This information was gathered at a meeting jointly hosted by NOAA/NMFS, Northwest Region and the SeaDoc Society, a program of the UC Davis Wildlife Health Center, School of Veterinary Medicine. Detailed meeting notes including literature cited are available at: http://www.vetmed.ucdavis.edu/whc/seadoc/pdfs/kw_mtg_notes_oct07.pdf

Appendix C: Selected MMHSRP Protocols

Disentanglement
C-2: Large Whale Disentanglement Network Advancement Policies

Procedure for Consideration for Network Members for Advancement with the Network

*NOTE: All correspondence and advancement consideration materials listed below should be with or provided to the NOAA Fisheries East Coast Disentanglement Coordinator unless directed otherwise

I. Identification for consideration for promotion by the following means:
    a. Self nomination
    b. NOAA---identified nomination (based on the responder acquiring additional experience or training since last consideration)
    c. Third party nomination (*i.e.* PCCS staff nominates a Network responder)

II. Preparation of responder experience resume highlighting disentanglement experience (including support roles) and training, vessel operations around whales, whale research and any other pertinent information to the review panel
    a. This step is completed by the responder wishing to be considered for promotion consideration, in conjunction with other higher---level Network responders assisting the Network member, or nominator.
    b. It is highly recommended that the experience resume includes representative images and short video clips depicting the Network member's involvement in disentanglement responses and/or pertinent whale research, etc.

III. Internal review by the NOAA Fisheries East Coast Disentanglement Coordinator of experience files and documentation submitted for each responder to ensure adequate documentation was provided to proceed to the full review panel

IV. NOAA Fisheries and a panel of approximately 5 anonymous external Level 4 and/or 5 reviewers (see below for differences) are authorized to review supporting documents and video.

    a. For Level 4 candidates:
        i. The anonymous review panel is composed of internal NOAA Fisheries representatives from the NER and SER and a panel of at most 5 anonymous external Level 4 and Level 5 reviewers. Each panelist is required to share with the other panelists and NOAA Fisheries staff their thoughts on the skills, abilities and qualifications of each responder being considered as it relates to the skills, experience and other criterion identified for a Network Level 4 responder (see Appendix 1). Each panelist is then requested to provide a private, confidential email to the NOAA Fisheries East Coast Disentanglement Coordinator with their recommendation to advance or not and a brief description of their rationale behind that decision.
    b. For Level 5 candidates:
        i. The anonymous review panel is composed of internal NOAA Fisheries representatives and a panel of at most 5 anonymous external Level 5

reviewers. Each panelist is required to share with the other panelists and NOAA Fisheries staff their thoughts on the skills, abilities and qualifications of each responder being considered as it relates to the skills, experience and other criterion identified for a Network Level 5 responder (see Appendix 1). Each panelist is then requested to provide a private, confidential email to the NOAA Fisheries East Coast Disentanglement Coordinator with their recommendation to advance or not and a brief description of their rationale behind that decision.

V. NOAA Fisheries reconvenes the internal panel to tally the recommendations and based on the majority vote, including NOAA Fisheries staff recommendations, the preferred outcome for the advancement or not of the responder being considered is selected. If there is a tie or disagreement, the permit holder, Teri Rowles, or her designee, has the final decision---making authority for the advancement. Once the recommendations are finalized, they are submitted to the permitting office for advancement.

VI. Responders are contacted to advise of the outcome of the advancement consideration and any status change.

Appendix 1. Criterion for Level 4 and 5 Network Responders

Level 4 Responder responsibilities and criteria (taken from permit language)

Targeted Individuals: Current Network Level 3 responders

Responsibilities

Level 4 activities

- Report, stand by, assess, document, attach a telemetry buoy, consult on an action plan and lead a disentanglement on all large whales except right whales.
    - Report, stand by, assess, document, participate with a Level 5 responder and attach a telemetry buoy to right whales

-on a case by case basis and after consultation, certain cuts on known entangled right whales may be permitted at level 4 ***if the proposed action is first approved by level 5 disentanglers and NMFS.***

- Train, evaluate and promote candidates for Level 1-3 under approved training methods.

Please Note: Entangled whale behavior varies considerably by species. However, Level 4 Disentanglers should routinely be able to lead a disentanglement of all large whales other than right whales.

Criteria for certification

Basic or Advanced Level 3 Certification and:

· Direct experience in a supervised (by PCCS/Network coordinators or NOAA Fisheries) large whale disentanglement, documentation of that experience, and a positive evaluation from NOAA Fisheries using information provided by PCCS/Network Coordinators and any hard documentation (i.e. video)

· When possible, commitment to consultation as detailed in Level 5 requirements.

Level 5 Responder responsibilities and criteria (taken from permit language)

Targeted Individuals: Current Network Level 4 responders

Responsibilities

Level 5 activities

- Report, stand by, assess, document, attach a telemetry buoy, consult on or assist in developing an action plan and lead a disentanglement of all large whales including right whales

Please Note: Right whales have exhibited aggressive behavior and therefore generally considered the most difficult whales to disentangle. North Atlantic right whales are among the most critically endangered large whales in the world. Certification at this level is highly selective and specialized.

Criteria for certification

Advanced Level 4 Certification and:

- Experience w/ right whale behavior and/or includes a person on the team directly involved in the whale disentanglement (in the boat working directly with the whale) that is experienced in right whale behavior
- Documented participation in a right whale disentanglement and NMFS/Advanced Network Responder review of video of participation in a right whale disentanglement that followed NMFS protocols

Commitment to Consultation to Include:

- Immediate Consultation: When possible, use satellite/cell phone to bring in additional ideas/experience from other Level 5's (and veterinarians and behaviorists if appropriate) while on scene with an entangled right whale
- Action Plan Development: For a tagged right whale, consultation is required with NMFS, Level 5's (and 4's if appropriate), veterinarians, behaviorists, etc.

Rationale for consultation: First assessments and strategies almost invariably change with more discussion or information. Consultation will likely help to increase human safety and critical choices regarding risks to whale health must be made with the best available information.

Appendix C: Selected MMHSRP Protocols

Disentanglement
C-3: Alaska Department of Fish & Game Steller Sea Lion Disentanglement Response Protocol

Response Protocol and GO/NO-GO criteria

12 March 2013 – michael.rehberg@alaska.gov

Because disentanglement of Steller sea lions is a new technique we expect modifications will be needed as we gain experience.

Selection criteria – GO / NO-GO

ADF&G will assess the following criteria when determining whether to attempt disentanglement of Steller sea lions:

1. Is the entanglement caused by anthropogenic marine debris?
2. Will the entanglement cause adverse effect upon the animal without human intervention?
3. Is the location safely accessible for responders?
    a. Will large groups of spectators be drawn to the area?
    b. Will response interfere with Alaska Native subsistence hunts?
    c. Will response interfere with local fisheries or tourism?
4. Is the entangled animal alone or located favorably among non-target animals?
    a. Will response cause disturbance of mother-pup pairs <2 months old?
    b. Will large numbers of older pup (>2 months)/mother pairs be disturbed?
5. Can the animal be approached from a concealed location at an appropriate distance?
    a. Are wind speed and direction favorable for stealthy approach and accurate darting?
6. Will large numbers of animals be disturbed? If so, can they exit safely?
    a. Are there cliffs, pools, or obstructions to consider before approaching?
9. Are transient killer whales present?
10. Do predicted weather and ocean conditions favor safety?
11. Are sufficient qualified responders available?

Procedure to minimize disturbance

Because Steller sea lions are gregarious, social animals that haul out in large numbers, it will rarely be possible to capture and disentangle an individual without causing incidental harassment of other sea lions. The following protocol for approaching occupied rookeries and haulouts is adapted from our *NMFS Research Permit No. 14325* and *ADF&G IACUC Protocol #09-27R*:

- Disentanglement will not be attempted in locations within breeding rookeries that are likely to disturb mother/pup pairs.

- Initial survey of the scene and identification of target entangled individual will be made by skiff, first passing carefully far offshore to judge wariness of the hauled out sea lions, later passing closer if needed to better judge the scene.
- Approach to the haulout will be made by skiff from the most practical concealed direction.
- A small darting team will be landed at this location and stalk carefully, wearing camouflaging clothes and using natural cover, to within 5-20 m of the subject animal.
- After subject animal is successfully immobilized, the remainder of the team will join the darting team. In our experience, at haulouts consisting of a single, continuous slab or small area this will likely flush all animals. On haulouts broken up by terrain or water, this will likely flush animals from the local area with sea lions in other locations more likely to remain hauled out.
- Prior to darting or restraint of target animal, personnel will cease efforts if significant injury to target or non-target animals appears imminent.
- Count estimates of incidental harassment takes will be recorded at the time of disturbance and reported to NMFS.

Capture

Sea lions will be captured under the direction of a qualified veterinarian through the use of drugs delivered by propelled darts. On land, the darting team will identify the entangled individual and ensure it is not too close to the ocean shoreline or pools of standing water. The darting team will select a position 5-20 m from the target animal. This close range permits relatively low impact velocities thus reducing the startle effect of darting, facilitates more accurate animal mass estimates and allows quicker access to the animal once induction has occurred. The dart will be delivered by rifle (such as those manufactured by *Dan-Inject*) and inject drugs IM, preferentially over the hips and tibia lumbar muscle or into the muscle over the shoulders. Drug combinations (for details see *Attachment 1*) will be selected at the discretion of the attending veterinarian or trained ADF&G biologist. Dosages are based on visual estimates of body mass. We do not anticipate subsequently placing target animals under gas anesthesia because we expect the disentanglement process will be rapid. The majority of drugs used in these combinations are considered reversible, and loaded darts will be ready to reverse the target sea lion after processing is complete or in the event induction of the target sea lion is incomplete and it moves out of our reach.

In situations where manual capture and restraint is indicated (*e.g.*, small young-of-year pups), we will capture sea lions using hand-held nets if possible and conditions warrant.

Impede or restrain conscious animals

The drug combination and protocol currently in use has been demonstrated to permit sea lions that inadvertently enter the water prior to induction to safely remain at the surface, breathe and recover spontaneously. However, sea lions that evade capture prior to full induction and enter the water also cannot be approached for disentanglement. Thus it may be necessary to physically restrict the entangled animal's access to water prior to immobilization drugs being administered or while waiting for their full effect.

Prior to darting, co-investigators will determine the path the entangled sea lion will most likely take if startled by darting. If safe and practical without causing excessive disturbance to non-target animals, personnel may be placed between the entangled sea lion and its avenue of escape before, during, or after darting. In our experience, sea lion movements can be influenced or directed by human presence. Personnel may use visual deterrents (*e.g.,* plywood, poles, etc.) or temporary restraint (*e.g.*, nets) to encourage the entangled animal to remain on, or return to, shore until induction and subsequent removal of entanglement.

Disentanglement, treatment, sampling, measurement and marking

Entanglements will be removed by lifting the material off the animal if possible and by cutting with clean instruments if necessary. Ingested line will be cut to remove external trailing line, flashers or other objects. Biologists will assess the risk of disentanglement attempts against the benefit of disentangling each individual, and it is possible that we may abandon disentanglement attempts that, in our judgment, cannot be completed safely for staff or for the target animal. Because disentanglement of Steller sea lions is a new technique, we will modify our procedure as we gain experience. That said, we have observed and photographed hundreds of entangled sea lions and have a good understanding of the type and severity of entanglements we are likely to encounter, which will inform our decisions on scene.

Any sampling, measurement, marking or tracking done under this permit shall be strictly incidental to disentanglement attempts. Previously unbranded sea lions will receive temporary dye, cattle marker, hair clipping or similar markings on the fur to permit short-term resights. Where practical, unbranded sea lions will receive numbered flipper tags to permit long-term resights. The outcomes of marked, disentangled sea lions will be monitored during the regular ADF&G mark-resight program.

Provided satellite tracking tags are available, practical and safe to attach to disentangled individuals, we may affix satellite tags to the head or dorsal fur using epoxy following ADF&G sea lion tagging protocol.

The attending veterinarian may, at his or her discretion, provide additional treatment to captured sea lions. This may include, but not be limited to, injectable antibiotics, wound care and similar procedures.

Release

After handling, sea lions will be released to their natural habitat. Any confinement of sea lions or transport away from the capture site will be temporary. We will not transport entangled or disentangled sea lions for rehabilitation.

Emergency euthanasia

We are authorized for emergency euthanasia only. It is not our intent to identify free-ranging individuals for the purpose of selecting euthanasia candidates. Euthanasia shall be performed by the attending veterinarian or an ADF&G biologist acting under the direction of the veterinarian and follow the procedures outlined in our *ADF&G IACUC Assurance of Animal Care (# 09-27R)* and ADF&G memo *Veterinary prescribed procedures for field euthanasia of Steller sea lions* (12 February 2009). A complete necropsy will be performed on any euthanized animal.

Monitoring outcomes

Personnel will monitor sites to the extent practical without causing disturbance to determine if target animal has recovered, assess disturbance caused during the response and identify any potential incidental injury or observable abandonment. Steller sea lion researchers and cooperators will be notified that a disentangled individual has been released along with identifying information. We will request any sightings, including photographs, be forwarded to ADF&G. ADF&G will watch for disentangled individuals during our annual mark-resight program, which includes a standard summer range-wide survey and smaller, local surveys within southeastern Alaska and Prince William Sound during other times of the year. These surveys monitor survival, reproduction and entanglement of individual sea lions. We have staff and skiffs stationed in Juneau, Haines and Anchorage from which it is possible to investigate local sightings of disentangled individuals.

Reporting

ADF&G will provide to NMFS a report of each disentanglement attempt, including:

- Summary of direct and incidental take
- Narrative description of the attempt and lessons learned
- Location, sex, age and identifying features of the captured sea lion
- Summary of measurements and sampling made, including disposition of any samples taken

Incidental injury beyond minor skin scrapes and any mortalities will be reported to NMFS OPR as soon as possible.

Media contacts will be coordinated with ADF&G, the MMHSRP and NMFS Office of Public Affairs (*via* NMFS Alaska Region).

Appendix C: Selected MMHSRP Protocols

Diagnostic Imaging
C-4: Monk seal Radiography Safety Requirements and Protocol

Safety Requirements and Protocol for Radiography (X-ray) of Hawaiian monk seals

Radiation Safety

- All persons not needed for restraint or equipment operation should move **at least 6 feet** away from the beam during imaging.
- All persons essential for animal restraint or equipment operation must wear protective aprons and thyroid guards during imaging. This protection is absolutely is **required**.
- No person should *ever* place a body part in the direct line of the x-ray beam, *even* if protective attire is worn.
- Whenever possible but at veterinary discretion, sedation or anesthesia should be used to reduce the need for animal restraint during imaging.
- Every effort should be made to keep the number of radiographs taken to a reasonable but minimal level to reduce exposure for animals and staff. Be sure to double check positioning before shooting to reduce the need for duplicate exposures.
- In general, selecting a higher Kvp with an appropriate reduction in mAs can result in a reduced radiation dose.
- Dosimetry badges (small badges worn during imaging that track cumulative radiation dose and must be specific to each individual) are highly recommended and should be checked annually.
    - Wear only your own badge
    - Store it in a cool, dry place away from radiation when not in use
    - Do not take your badge home.
    - Do not launder the badge or get it wet.
    - Do not expose to heat, such as in a car in summer.

Radiograph Sampling

Select text below copied from "Description of Radiograph Sampling" for NMFS Permit 932-1905

Radiography (x-rays) may be conducted on animals captured during emergency response, animals undergoing rehabilitation; or, on any species in the wild, in rehabilitation, or in captivity during research studies. Animals of any age/sex could be radiographed, including pregnant females*, at veterinary discretion.

Radiographic methods used on Hawaiian monk seals include standard digital radiographs. Other radiographic methods (e.g., computed tomography (CT) magnetic resonance imaging (MRI)) are uncommonly used in monk seals and are not addressed in this protocol.

Standard radiographs may be used for a variety of reasons including, but not limited to, assessment of: entanglements, ingested foreign objects (e.g., hooks), wounds, lesions, detection of wounds/lesions/infection, pregnancy, and evaluation of cardiac function and other internal organs.

A dedicated digital, portable field x-ray unit is available exclusively for Hawaiian monk seal use in Hawaii. This unit is owned by The Marine Mammal Center. It typically resides on Oahu and is housed at the NOAA IRC so that it is available for emergency use by first responders. However,

when there are seal patients at TMMC's Ke Kai Ola facility in Kona, Hawaii, the unit will be housed in that location so that it is available in an emergency should one arise with seals in rehabilitation.

Chapter 25 of the *CRC Handbook of Marine Mammal Medicine* will be used as a reference for equipment and methods of radiography for marine mammals (Van Bonn et al. 2001). This reference is available in Michelle's office.

Sedation and/or general anesthesia may be necessary for the comfort of the animal and to limit movement; or, imaging may be conducted concurrently with other scheduled medical procedures requiring sedation or anesthesia. The level of sedation/restraint is at the discretion of the attending veterinarian and should consider animal size, sex and capacity of personnel on site.
Animals will be monitored by veterinary staff during the procedure. Based upon the radiographic findings the animals may be admitted to rehabilitation or treated and released in the field.

Radiography may be used on carcasses at any time and at a minimum, its use is strongly encouraged for continuing practice with the equipment.

Only qualified veterinarians or other personnel with sufficient experience in the technique will be allowed to perform these procedures. Trained and experienced animal handlers would conduct capture and restraint activities. Care will be taken to minimize any impacts from capture and restraint. The attending veterinarian will sedate or anesthetize pinnipeds and cetaceans if deemed necessary to reduce stress and ensure the safety and welfare of the animal. Appropriate measures will be taken to mitigate any deleterious impacts of sedation/anesthesia if needed.
Animals will be monitored for hyper and hypothermia and appropriate measures will be taken to mitigate either condition. Radiographic procedures will be discontinued if animals exhibit excessive stress, pain, or suffering during the procedure.

*There is little risk to the fetus when radiographing pregnant animals (Toppenberg et al. 1999; http://www.aafp.org/afp/990401ap/990401b.html). The accepted cumulative dose of ionizing radiation during pregnancy is 5 rad, and no single diagnostic study exceeds this maximum. For example, a fetus would receive a dose of 0.00007 rad from a two-view chest x-ray of a human mother (Toppenberg et al. 1999). Radiographs are often used in small animal practices to diagnose and stage pregnancies.

References

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APPENDIX D
DIRECTIVES RELEVANT TO MMHSRP

NATIONAL MARINE FISHERIES SERVICE POLICY DIRECTIVE 02-308
March 9, 2012

Protected Resources Management

MARINE MAMMAL HEALTH AND STRANDING RESPONSE PROGRAM

NOTICE: This publication is available at: http://www.nmfs.noaa.gov/directives/.

OPR: F/PR2 (H. Braham) **Certified by:** F/PR (J. Lecky)
Type of Issuance: Initial

Introduction

With the passage of the Marine Mammal Protection Act (MMPA) of 1972, the Secretary of Commerce granted the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) jurisdiction over all cetaceans and all pinnipeds, except walrus, in U.S. waters. The MMPA also granted NMFS the authority to take stranded marine mammals in a humane manner, if such taking is for the protection or welfare of the mammal, the protection of the public health and welfare, or the nonlethal removal of nuisance animals. Following the passage of the MMPA, the marine mammal stranding network was formally established and organized as independent volunteer organizations coordinated through each of the NMFS jurisdictional regions.

Objective

Mounting concerns over marine mammal health and deteriorating ocean conditions prompted the passage of the Marine Mammal Health and Stranding Response Act (MMHSRA) in 1992, which was codified as Title IV of the MMPA. Title IV established the Marine Mammal Health and Stranding Response Program (MMHSRP) with three primary purposes to:

1. facilitate the collection and dissemination of reference data on the health of marine mammals and health trends of marine mammal populations in the wild;
2. correlate the health of marine mammals and marine mammal populations, in the wild, with available data on physical, chemical, and biological environmental parameters; and
3. coordinate effective responses to unusual mortality events (UME) by establishing a process in the Department of Commerce in accordance with Section 404 of the MMPA.

This directive establishes the framework for the implementation of the MMHSRP by NMFS. MMPA Title IV and implementing regulations are adopted by reference as the NMFS Policy on Marine Mammal Health and Stranding Response.

Authorities and Responsibilities

Title IV of the MMPA and delegations of its authority establish the following programs and responsibilities overseen by the NMFS Office of Protected Resources, NMFS Regional Offices and NMFS Science Centers:

- National Marine Mammal Stranding Network
- National Marine Mammal UME Investigation Program
- National Marine Mammal Tissue Bank (NMMTB) and Quality Assurance Program

- Marine Mammal Health Biomonitoring, Research, and Development Program
- National Marine Mammal Entanglement Response Program
- John H. Prescott Marine Mammal Rescue Assistance Grant Program
- Information Management and Dissemination Program.

The National Marine Mammal Stranding Network consists of organizations nationwide that respond to stranded or entangled marine mammals. These organizations are authorized by NMFS to respond to stranding events under the authority of Section 112(c) or Section 109(h) of the MMPA.

Under a Scientific Research and Enhancement Permit issued under the MMPA and the Endangered Species Act (ESA) by the NMFS Office of Protected Resources' Permits Division, the MMHSRP authorizes stranding response by the National Marine Mammal Stranding Network members for ESA-listed marine mammal species, marine mammal entanglement response efforts, and a variety of marine mammal health-related research, monitoring or investigative activities. The MMHSRP obtains health information and samples from marine mammals that are stranded, undergoing rehabilitation, by-caught, subsistence hunted, remotely accessed, and live captured and released.

Measuring Effectiveness

This Policy will be reviewed and updated annually in accordance with the NMFS Policy Directive System procedures. Under MMPA, stock assessments are used to assess progress in protecting marine mammals and preventing them from diminishing below their optimal sustainable population. These reports are produced annually and data from the MMHSRP are reviewed and used in these reports. Effectiveness of Unusual Mortality Event investigations is reviewed annually by the Working Group on Marine Mammal Unusual Mortality Events.

In addition, NMFS will hold quarterly conference calls and annual retreats with the regional stranding coordinators to discuss MMHSRP updates and needs. NMFS invites stranding networks to annual or biennial regional conferences to discuss stranding data, conduct training, provide information, and assess the effectiveness of current policies and procedures. NMFS continues to process new Stranding Agreement applications, as well as review and renew expiring Stranding Agreements on an as needed-basis according to the appropriate regional timetable.

Procedural directives will be issued to implement this policy as needed.

/s/ 2/24/2012

Samuel D. Rauch III Date
Acting Assistant Administrator for Fisheries

Department of Commerce National Oceanic & Atmospheric Administration National Marine Fisheries Service

NATIONAL MARINE FISHERIES SERVICE INSTRUCTION 02-308-01
March 14, 2012

Protected Resources Management
Marine Mammal Health and Stranding Response Program

NMFS FACILITY STANDARDS FOR REHABILITATING ESA-LISTED SPECIES

NOTICE: This publication is available at: http://www.nmfs.noaa.gov/directives/.

OPR: F/PR2 (H. Braham) **Certified by:** F/PR (J. Lecky)
Type of Issuance: Initial

Signed /s/ Lecky 2/29/2012
James H. Lecky Date
Director, Office of Protected Resources

Procedural Directive
Facility Standards for Rehabilitating ESA-Listed Species Under the MMHSRP Scientific Research and Enhancement Permit

Background

Under the authority of Section 112(c) of the Marine Mammal Protection Act (MMPA), the National Marine Fisheries Service (NMFS) may enter into a Stranding Agreement with a person or organization for marine mammal stranding response and rehabilitation. The Stranding Agreement authorizes the taking of marine mammals under Section 109(h) of the MMPA, but does not provide authorization for take of species listed as endangered or threatened under the Endangered Species Act of 1973 (ESA), as amended. Authorization under section 10(a)(1)(A) of the ESA to take ESA-listed marine mammals under NMFS' jurisdiction for enhancement purposes is currently provided under NMFS Permit No. 932-1905/MA-009526, issued to the NMFS National Marine Mammal Health and Stranding Response Program (MMHSRP). Take of ESA-listed marine mammals under the MMHSRP permit for stranding response and rehabilitation by Stranding Agreement holders requires Co-Investigator authorization and direction from the NMFS MMHSRP Coordinator and the appropriate Regional Stranding Coordinator in the event of a stranding involving a threatened or endangered species of marine mammal.

In this procedural directive, NMFS outlines the necessary facility standards for rehabilitating ESA-listed species. If the facility does not comply with this Procedural Directive's standards, then NMFS will make arrangements to transfer the ESA-listed species to a facility in compliance. The minimum standards for all marine mammal rehabilitation facilities are described in NMFS' *Policies and Best Practices for Marine Mammal Response, Rehabilitation, and Release – Standards for Rehabilitation Facilities*. Additional requirements for ESA-listed species are included below.

Short-Term (<96 hours) Rehabilitation Facilities

- NMFS has determined that the facility meets minimum standards for rehabilitation facilities and has specific accommodations available in the facility for each ESA-listed species and for ESA-listed species with a specific medical condition.

- At the request of the Principal Investigator for the MMHSRP's Permit No. 932-1905/MA-009526 (hereinafter "PI"), a facility that may not meet minimum rehabilitation standards for long-term holding can serve as a temporary stabilization location prior to transferring the animal to a long-term holding facility. The facility must comply with all requests and recommendations for stabilization care from NMFS or consulting veterinary/wildlife experts. Facility needs to be pre-approved by the PI prior to holding an animal for temporary stabilization.

- Exceptions to the <96 hour short-term holding timeframe may be made on a case-by-case basis with agreement from NMFS (at a minimum, the PI and the Regional Stranding Coordinator), the short-term facility and the long-term rehabilitation facility receiving the animal.

Long-Term (>96 hours) Rehabilitation Facilities

- NMFS has determined that the facility meets minimum standards for rehabilitation facilities and has specific accommodations available in the facility for each ESA-listed species and for ESA-listed species with a specific medical condition. In addition, the facility implements specific modifications as defined by the PI, attending veterinarian or NMFS consulting veterinarian/wildlife experts.

- Facility has dedicated space to use for individually housing ESA-listed species or to provide an appropriate social environment with adequate room for more than one animal of a social species if needed or appropriate as deemed by the attending veterinarian. (For example, if the attending veterinarian believes that a Steller sea lion pup should be co-housed with another animal and no other Steller sea lions of appropriate age or medical condition are available, then the attending veterinarian may deem it appropriate to house the animal with an appropriate age/medical class California sea lion.) This dedicated space may be used for other non-listed species when ESA-listed animals are not on-site and at the discretion of the attending veterinarian as long as appropriate disinfectant and other procedures to prevent transmission of disease are in place.

Staffing Standards

- Facility meets the minimum standard that appropriate veterinary medical care is provided as needed and requested 7 days a week.

- Attending veterinarian and animal care personnel have prior experience with subject ESA-listed species and specific expertise for treatment of medical conditions present in each ESA-listed species held, or consult experts with specific expertise. Attending veterinarian is available and actively consults with the PI and consulting veterinarian. Recommended treatments discussed during consultations with the NMFS MMPA/ESA permit holder and consulting veterinarian are addressed as advised by the PI or consulting veterinarian. Attending veterinarian and animal care staff are available on-site full-time if needed and promptly implement activities requested by the PI.

- Attending veterinarian is available on-call 24 hours a day and is on-site at least 20 hours per week, or more if needed. Whenever procedures are conducted on ESA-listed species, they must be under the direct supervision of professional staff and the attending veterinarian. The attending veterinarian or animal care staff notifies the PI prior to conducting major medical procedures (*e.g.* procedures requiring sedation/anesthesia and/or surgery). Recommendations from the PI or NMFS consulting veterinarian(s) are implemented in accordance with the time frame determined by the PI or consulting veterinarian(s).

- Attending veterinarian consults with the PI and the appropriate Regional Stranding Coordinator regarding the recommendation for release and the release plan for ESA-listed species. The MMHSRP Permit (No. 932-1905/MA-009526) is conditioned to require that the PI approve release determinations for rehabilitated threatened and endangered marine mammals. These Permit conditions are included in Appendix A. After the PI approves the

release determination, the appropriate NMFS Regional Administrator will issue a letter of concurrence for the release of the marine mammal.

References

Endangered Species Act (ESA) – 16 U.S.C. §1531 et. seq.

Marine Mammal Protection Act (MMPA) 16 U.S.C. §1421 et. seq.

Marine Mammal Protection Act Implementing Regulations 50 C.F.R. §216.27(a)(3)

Policies and Best Practices - Marine Mammal Stranding Response, Rehabilitation and Release – Standards for Rehabilitation Facilities, NOAA National Marine Fisheries Service, February 2009.

Supported by references

This procedural directive is supported by the reference listed in Policy Directive 02-308.

Appendix A
Permit No. 932-1905/MA-009526 Enhancement Conditions for Activities on Threatened and Endangered Species under NMFS Jurisdiction Conducted Pursuant to ESA Section 10(a)(1)(a) and MMPA Sections 109(h), 112(c), and Title IV

1. Response, rescue, disentanglement, rehabilitation, release, euthanasia, and necropsies of threatened and endangered cetaceans and pinnipeds under NMFS jurisdiction must be conducted in accordance with the following:
    a. "*Policies and Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release*" (hereinafter "*NMFS Policies and Best Practices*") in Appendix C of the Programmatic Environmental Impact Statement for the Marine Mammal Health and Stranding Response Program - Final Programmatic Environmental Impact Statement [FEIS]: http://www.nmfs.noaa.gov/pr/pdfs/health/eis_appendixc.pdf; and "*Marine Mammal Oil Spill Response Guidelines*" in Appendix L of the FEIS: http://www.nmfs.noaa.gov/pr/pdfs/health/eis_appendixl.pdf.

    b. The Permit Holder or PI may request exceptions to these requirements from the Permits Division on a case-by-case basis.

    c. Release determinations for rehabilitated threatened and endangered marine mammals must be approved by the PI.

    d. Euthanasia of stranded (e.g., sick, injured, entangled) or rehabilitating threatened and endangered marine mammals must be approved by the PI.

2. In order to avoid, minimize, or eliminate impacts on the affected species, non-target species, and the environment, mitigation measures described in Chapter 5 of the FEIS must be followed for the activities authorized by this permit as listed in (1) above: http://www.nmfs.noaa.gov/pr/pdfs/health/eis_chapter5.pdf. These mitigation measures must also be followed with regard to ensuring human health and safety.

3. The PI must notify the Permits Division prior to disentanglements of pinnipeds on or near rookeries and on densely populated haul outs. Such activities must be conducted in a manner to minimize danger to non-target animals. If standard protocols have been submitted for prior approval, notification is not required.

4. Hazing protocols for threatened and endangered species must be developed and updated based on the best available science. Such protocols must be submitted to the Permits Division.

5. The Permit Holder must provide annual updates to protocols for all response activities involving threatened and endangered species authorized by this permit. These should be included with the permit annual reports.

Department of Commerce National Oceanic & Atmospheric Administration National Marine Fisheries Service

NATIONAL MARINE FISHERIES SERVICE INSTRUCTION 02-308-02
March 14, 2012

Protected Resources Management
Marine Mammal Health and Stranding Response Program

NMFS PLACEMENT PROCESS FOR NON-RELEASABLE MARINE MAMMALS

NOTICE: This publication is available at: http://www.nmfs.noaa.gov/directives/.

OPR: F/PR2 (H. Braham) **Certified by:** F/PR (J. Lecky)
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Signed s/ 2/29/2012
James H. Lecky Date
Director, Office of Protected Resources

Procedural Directive
Process for Placing Non-Releasable Marine Mammals from the Stranding Program into Permanent Care Facilities

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Background

As intended by the Marine Mammal Protection Act (MMPA), the Marine Mammal Stranding Network (MMSN) attempts to successfully rehabilitate and release back to the wild each stranded marine mammal that is admitted into rehabilitation. The majority of rehabilitated animals are in fact, released back into the wild. However, in some cases, the attending veterinarian may determine that (1) release of a rehabilitated marine mammal could adversely affect wild marine mammal populations, and/or (2) release is not likely to be successful given the physical condition and behavior of the animal. In these cases, the animal may be considered non-releasable by the National Marine Fisheries Service (NMFS) Regional Administrator (RA) in the region where the rehabilitation facility resides. Once a marine mammal is deemed non-releasable by the RA, its permanent placement is determined by the NMFS Office of Protected Resources (OPR) in Silver Spring, MD.

In this procedural directive, NMFS outlines the process for determining permanent disposition for marine mammals deemed non-releasable by a RA. In some cases, multiple facilities are interested in receiving custody of a non-releasable animal. A systematic placement process ensures equitable, transparent, and fair consideration for all institutions requesting permanent custody of non-releasable animals.

Authority

NMFS has authority under 16 U.S.C. 1374, Section 104 of the MMPA, to regulate the acquisition and disposition of marine mammals (cetaceans and pinnipeds) through public display and research facilities and is responsible for maintaining the national marine mammal inventory. Coordination with U.S. Department of Agriculture (USDA)/Animal and Plant Health Inspection Service (APHIS) on non-releasable animal placements ensures compliance with Animal Welfare Act (AWA) requirements by receiving facilities. Manatees, sea otters, polar bears, and walrus are under the jurisdiction of the Department of the Interior (DOI) – U.S. Fish and Wildlife Service (USFWS), and are not included in this procedural directive.

Disposition Determination Process

A. Required Criteria for Marine Mammals Under NMFS Jurisdiction (Pinnipeds and Cetaceans)

For a facility to be eligible to receive a non-releasable marine mammal, they must provide NMFS with documentation that they:

(1) hold an Exhibitors License (public display) or be registered as a research facility under the Animal Welfare Act (AWA) from APHIS (7 U.S.C. 2131 et seq.);
(2) comply with the MMPA for public display or scientific research/enhancement (16 U.S.C. 1374, Section 104 of the MMPA);
(3) agree to hold the animal in conformance with all requirements and standards for public display or scientific research/enhancement as applicable;
(4) have thoroughly reviewed the animal's medical history;
(5) are able to provide adequate quarantine if needed; and
(6) are willing to arrange and incur all costs associated with transport.

B. Facility Placement File

NMFS OPR Permits Division maintains a file of U.S. public display and research facilities who have expressed interest in obtaining non-releasable marine mammals from the MMSN. For pinnipeds, NMFS OPR Permits Division maintains a National Placement List of interested facilities. It is the responsibility of each facility to: (1) notify NMFS of their interest in obtaining a non-releasable marine mammal; (2) ensure their contact information is current; (3) ensure their species request(s) are current; and (4) notify NMFS OPR Permits Division if they are no longer interested in obtaining non-releasable animals. This list is used to contact facilities when animals become available for permanent placement. All the above information must be provided to NMFS OPR Permits Division in writing via email or letter. For cetaceans, NMFS OPR Permits Division notifies all facilities holding captive cetaceans of non-releasable animals as they become available for placement for submission of the placement questionnaire.

C. Case Specific Criteria for Pinnipeds

For a facility to be considered for the placement of a non-releasable pinniped, the facility must be on the National Placement List (unless no other facilities on the list are interested) and meet the MMPA requirements (16 U.S.C. 1374, Section 104 of the MMPA) for holding marine mammals for either public display or scientific research/enhancement. While efforts are made to place animals in the order of the facilities on the National Placement List, placement will be dependent on matching animals with facilities based on sex, age, physical or behavioral limitations, and the time in which a facility can accept the animal(s).

D. Case Specific Criteria for Cetaceans

Each rehabilitated, non-releasable cetacean case is unique; thus, for each cetacean deemed non-releasable, NMFS will identify case-specific criteria that reflect that animal's needs (e.g., spinner dolphins are not easily transported long distances and there are few conspecifics currently in captivity, young dependent calves are more likely to thrive in maternal social groups,

chronically-ill dolphins may require special veterinary care, etc.). In some cases, NMFS will consult with veterinarians, behavior experts, and/or species experts to determine the most appropriate criteria. Some examples of case-specific criteria include, but are not limited to: (1) qualification and experience of staff relevant to animal's needs (e.g., experience with neonates and bottle-feeding); (2) composition of animal groups by species, sex, age, to accommodate animal's specific social needs (e.g., a juvenile male is more likely to thrive in social group of female adults and other juvenile males/females, versus only other adult males, or spinner dolphins are more likely to thrive with conspecifics); (3) on-site veterinary care (for calves, or cetaceans with chronic medical conditions, missing appendages, or sensory limitations); (4) transport method and distance (e.g., offshore cetaceans have difficulty being transported long distances, as do chronically ill, or very young cetaceans); and (5) time frame the receiving facility can arrange for and complete transport (e.g., in some cases it may be necessary to move an animal quickly, as in the case of an ongoing oil spill when additional rehabilitation space may be required).

E. Evaluation of Criteria

Facilities proposing to receive custody of a non-releasable cetacean should provide information to NMFS that demonstrates their plan for meeting the criteria (per the process outlined below). Appendix A provides one example of information NMFS OPR may request from facilities. In some cases, criteria are weighted to reflect the most important criteria in order of priority (e.g., transport time for offshore cetaceans such as spinner dolphins may be significant and weighted more heavily than with a more robust species such as a bottlenose dolphin). If criteria are weighted, it will be noted on the questionnaire provided to facilities. Each proposal will be reviewed by NMFS OPR and Regional staff to determine how well the established criteria are met and will be given an overall score by averaging the scores of each reviewer.

F. Requesting Authorization to Retain Custody of a Rehabilitated, Non-Releasable Marine Mammal

Some licensed public display facilities and authorized research facilities are also authorized under Section 112(c) of the MMPA to rehabilitate stranded marine mammals. When an animal undergoing rehabilitation is deemed non-releasable, the facility may request authorization from NMFS OPR to retain custody of the non-releasable animal for their public display or research program. NMFS OPR will consider these requests first and may authorize the facility to retain the animal, provided placement criteria are sufficiently met for that animal (see process steps above). If placement criteria are not met by the facility rehabilitating the marine mammal, NMFS may authorize transfer of custody to another facility based on the disposition process outlined below. Rehabilitation of a non-releasable marine mammal by a public display facility under the authority of Section 112(c) of the MMPA does not guarantee that the animal will be permanently placed at that facility.

G. Notification to Public Display Facilities Regarding Availability of a Non-Releasable Marine Mammal

When a marine mammal is determined non-releasable and needs placement at a facility other than where the animal is being rehabilitated, NMFS OPR will coordinate placement from the

National Placement List for pinnipeds or the placement questionnaire for cetaceans. See Step 4 for additional details.

Step-by-Step Process for Placing Non-Releasable Marine Mammals

During any step of this process, NMFS may consult with veterinarians, behavior experts, and/or species experts regarding placement criteria.

Step 1. The rehabilitation facility's attending veterinarian (in consultation with their Assessment Team) submits a written and signed release determination request to the appropriate NMFS RA requesting that an animal be deemed either releasable, conditionally releasable, or non-releasable based on the criteria outlined in NMFS' *Policies and Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release.* This report must provide a basis for the veterinarian's recommendation, and in some cases, should include copies of the most recent medical data such as blood work.

Step 2. The NMFS RA reviews the recommendation and makes a final disposition determination. If the RA determines that an animal is non-releasable, a letter is written to the stranding rehabilitation facility stating that the animal is non-releasable, and the facility has 30 days to request authorization to (a) retain custody of the marine mammal; (b) transfer custody; or (c) arrange any other disposition authorized by the RA. It is important to note that the RA or Office Director (OD), in their sole discretion, may order the release, continued rehabilitation, or any other disposition as authorized (*see* 50 C.F.R. 216.27 (b)). Furthermore, in order for a facility to request retention of custody of a marine mammal, they must meet the specific criteria for that animal as described in Section III of this Procedural Directive.

Step 3(a) (Pinnipeds). Because these species have fewer case specific considerations, placements are based on an institution's position on the National Placement List as well as matching animal specifics (e.g. age, sex, or other limitations) with appropriate facilities.

Step 3(b) (Cetaceans). Criteria for cetaceans are established for each case by (1) using required criteria (e.g., must be licensed for public display); (2) using criteria from previous similar cases (e.g., dependant calves); (3) consulting with marine mammal veterinarians, behavior and/or species experts to determine case-specific criteria (e.g., uncommon rehabilitated species such as a spinner dolphin). In some cases, criteria are weighted to ensure that the most important criteria for a particular animal's needs are met (e.g., time frame that an animal can be accepted due to extenuating circumstances at a rehabilitation facility, or availability of a lactating female (surrogate mother) for a neonatal animal).

Step 4(a) (Pinnipeds). Institutions are considered in the order they are placed on the National Placement List taking into account the specific animal criteria they have identified as part of their initial request. If the first matched institution is not interested in the particular animal(s) available, then the next institution on the list is contacted and so on, until the animal has been placed.

Step 4(b) (Cetaceans). NMFS OPR notifies via email all interested U.S. facilities regarding the availability of a non-releasable cetacean. The notification typically includes: (1) required criteria; (2) specific criteria and weighting; (3) deadline for proposals; and (4) any other relevant

information or requests for that particular case. Deadlines for proposals typically range from 1-2 weeks depending on case-specific needs.

Step 5(a) (Pinnipeds). Pinniped placement is coordinated by NMFS OPR.

Step 5(b) (Cetaceans). NMFS reviewers consisting of biologists from NMFS OPR, Regional Offices, and/or Science Centers, conduct an integrated assessment of all proposals to determine how well they meet the criteria. Each proposal is given an overall score by averaging the scores of each reviewer. NMFS' review of proposals is typically completed within 1-2 weeks after the proposal deadline but largely depends on case-specific needs.

Step 6(a) (Pinnipeds). APHIS is consulted regarding the AWA compliance history of the receiving facility. NMFS will consider the input received from APHIS and make a final decision on disposition. The receiving facility is notified and is required to submit a letter of intent to retain/acquire the pinniped.

Step 6(b) (Cetaceans). NMFS OPR ranks the proposals by averaging the scores of the reviewers, identifying primary candidate facilities for receiving custody of the non-releasable cetacean, and contacts APHIS to ensure the primary candidates are in compliance with AWA requirements. Once NMFS OPR receives this information from APHIS, a final disposition decision is made. NMFS will (1) notify the facility that they will be transferred custody of the cetacean; and (2) notify the rehabilitation facility regarding transfer of custody decision. If a facility is not currently in compliance with APHIS standards, NMFS will pursue the secondary candidate and so forth, to ensure the receiving facility meets the required criteria. The receiving facility is required to submit a letter of intent to acquire the cetacean. All other facilities who submitted a proposal are notified by NMFS via email that their proposal was not selected. Proposals need to be submitted each time there is a non-releasable cetacean; NMFS will not retain proposals from previous cases.

Step 7. NMFS OPR issues a letter of transfer to the receiving facility, authorizing the change of custody and requesting verification of transfer with the return of a Marine Mammal Data Sheet. The animal is then transported to the receiving facility and put in quarantine (if appropriate). There shall be no remuneration associated with any transfer of a rehabilitated, non-releasable marine mammal. The transferee, should they choose to do so, may reimburse the rehabilitation facility for costs associated with the rehabilitation and transport of the animal (*see* 50 C.F.R. 216.27 (c)). However, reimbursement may not be requested or demanded by the transferor.

Step 8. Upon verification of the transfer from the animal holder, the NMFS OPR Permits Division provides the receiving facility with an updated Marine Mammal Data Sheet reflecting the species and sex of the marine mammal, along with the date of transport. The animal is then added to the Marine Mammal Inventory maintained in the NMFS Permits Division.

Exportation of Non-Releasable Marine Mammals

The current NMFS policy is for non-releasable marine mammals to be placed first within the U.S. as long as there are facilities interested and able to accept them. Should it become

necessary to consider placement of non-releasable of marine mammals outside the U.S. the following guidance is provided:

- The MMPA provides NMFS the authority to transfer non-releasable marine mammals to qualified U.S. facilities for permanent captivity; however, there is no clear mechanism within the MMPA for NMFS to export marine mammals directly to facilities outside the U.S.
- The MMPA allows marine mammals that have been placed in public display facilities to be exported by the permitted facility, without an additional permit, to a facility in another country provided that the receiving foreign facility meets standards that are comparable to those required of U.S. facilities (*See* 16 U.S.C. § 1374(c)(2)(B) and (c)(9)).
- To ensure the legal transfer of non-releasable marine mammals to interested facilities outside of the U.S., NMFS would have to transfer custody of the animal to a U.S. facility which, in turn, could export the animal to qualified facilities in other countries.

Appendix A

Sample Questionnaire Provided to Facilities Interested in Obtaining Custody of a Non-Releasable Cetacean

Case Example:

This questionnaire was created for the placement of a healthy, non-releasable, male bottlenose dolphin that was a dependent calf, estimated to be ~ 2 year old.

Questionnaire for <u>Field#451</u>

Please provide the following --
Facility Name:
Point of Contact:
Phone:
Email:

Questions Regarding Social Needs (weight 50%)

1. These questions address the social groupings that your facility has for consideration of the placement of this animal:

    a. How many dolphins does your facility currently maintain and how many social groups (by age and sex) are they maintained in?

    b. Does your facility have an older female(s) or female(s) who have experience with calves and may act to protect the individual from others?

    c. Does your facility have a small group of similarly aged males this animal could be introduced to during non-breeding season before being introduced into a larger group?

d. Does your facility have a nursery area (mothers with independent calves) that this animal could be introduced to?

e. What would be your plan for incorporating this animal into a social group?

f. What would be your contingency social group(s), if introduction to target group was unsuccessful?

2. These questions address quarantine/isolation of the animal:

   a. Based on this animal's history, do you feel quarantine/isolation is necessary?

   b. Indicate the expected duration of quarantine/isolation?

   c. Please briefly describe your plans for quarantine.

Questions Regarding Transport (weight 30%)

3. Is your facility willing to arrange and incur all costs associated with transport?

4. What is the estimated time for transport ('door-to-door") from the rehabilitation facility to your facility?

5. What type of transportation and methods would you use (e.g., plane, truck; wet, dry?)

6. Will your veterinarian or another veterinarian experienced with marine mammal transports attend to the animal during transport?

7. Would you be able to send staff to the rehabilitation facility to become familiar with the animal and to assist with training for transport? If yes, what would be the ideal duration of staff presence?

8. How soon could you arrange to transport this animal and receive him/her at your facility? Please be realistic with your time frame, and please note there is an expectation that you would receive the animal no later than one month after receiving the transfer paperwork from NMFS unless an exception is clearly outlined in your response.

Other Questions (weight 20%)

9. Has your veterinary staff thoroughly reviewed the medical history and records of this animal? Are there any concerns among your animal care or veterinary staff?

10. How many days per week is your attending veterinarian on site? Does he/she reside locally for close medical monitoring and evaluation?

11. Is your facility part of a breeding program?

12. Does your facility have the experience, resources, and staff to care for this animal? Please describe.

13. Is your facility accredited by the Association of Zoos and Aquariums (AZA), the Alliance of Marine Mammal Parks and Aquariums (AMMPA), or another comparable professional society with animal care standards?

14. Please provide any other information about your facility or program that you feel may aid us in making a permanent placement decision.

Please return Questionnaire by DATE (TIME Eastern) to: NMFS Point of Contact at email address. Questions regarding the placement process should be directed to NMFS (NAME) via email or phone**.** Questions regarding this animal and its medical history can be directed to point of contact at Rehab Facility via email or phone.

References

Animal Welfare Act (AWA) - 7 U.S.C. §2131 et. seq.

Marine Mammal Protection Act (MMPA) 16 U.S.C. §1374 et. seq.

Marine Mammal Protection Act (MMPA) 16 U.S.C §1421 et. seq.

Marine Mammal Protection Act Implementing Regulations 50 C.F.R. §216.27(b)(2). Upon receipt of a report under paragraph (b)(1) of this section, the Regional Director or Office Director, in their sole discretion, may:

(i) Order the release of the marine mammal;
(ii) Order continued rehabilitation for an additional 6 months; or
(iii) Order other disposition as authorized.

Marine Mammal Protection Act Implementing Regulations 50 C.F.R. §216.27(c)(4). There shall be no remuneration associated with any transfer, provided that, the transferee may reimburse the transferor for any and all costs associated with the rehabilitation and transport of the marine mammal.

Policies and Best Practices - Marine Mammal Stranding Response, Rehabilitation and Release – Standards for Rehabilitation Facilities, NOAA National Marine Fisheries Service, February 2009.

Policies and Best Practices - Marine Mammal Stranding Response, Rehabilitation and Release – Standards for Release, NOAA National Marine Fisheries Service, February 2009.

Supported by references

This procedural directive is supported by the reference listed in Policy Directive 02-308.

APPENDIX E
PERMIT CONDITIONS

Enhancement[1] Conditions for Activities Conducted Pursuant to MMPA Sections 109(h), 112(c), and Title IV, and ESA Section 10(a)(1)(a)

1) Emergency response, rescue, entanglement response, rehabilitation, release, euthanasia, and necropsies of threatened and endangered cetaceans and pinnipeds, and entanglement response of any marine mammal under NMFS jurisdiction, must be conducted in accordance with the following:
   a. "*Policies and Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release*" (hereinafter "*NMFS Policies and Best Practices*") in Appendix C of the Final Programmatic Environmental Impact Statement for the Marine Mammal Health and Stranding Response Program [PEIS]: http://www.nmfs.noaa.gov/pr/pdfs/health/eis_appendixc.pdf; and "*Marine Mammal Oil Spill Response Guidelines*" in Appendix L of the PEIS: http://www.nmfs.noaa.gov/pr/pdfs/health/eis_appendixl.pdf.

   b. The Permit Holder/Responsible Party or PI may request exceptions to these requirements from the Permits Division on a case-by-case basis.

   c. Release determinations of rehabilitated threatened and endangered marine mammals must be approved by the PI or designee.

   d. Euthanasia of stranded (e.g., sick, injured, entangled) or rehabilitating threatened and endangered marine mammals must be approved by the PI or designee.

2) Researchers must notify the PI or designee prior to entanglement response of pinnipeds on or near rookeries and on densely populated haul outs. Such activities must be conducted in a manner to minimize danger to non-target animals.

3) Protocols for all response activities involving threatened and endangered species must be developed and updated based on the best available science. Any updated protocols must be submitted to the Permits Division.

4) For Cook Inlet beluga whales, main Hawaiian Islands insular false killer whales, and Southern Resident killer whales, captures may only occur if there is an unusual mortality event, oil spill, or other emergency health threat necessitating intervention (Appendix 1, Table 1).

5) For Hawaiian monk seals, this permit does not authorize hot branding (Appendix 1, Table 1), vaccinations (Appendix 1, Tables 1 or 2), or capture activities for research on healthy monk seals in the wild (Appendix 1, Table 2).

6) Hot branding pinnipeds:
   a. Hot branding may only be conducted in emergency response or response-related research activities (Appendix 1, Table 1), and not during baseline health research (Appendix 1, Table 2).
   b. The least invasive marking method possible that meets the requirements of the situation will be considered and chosen.
   c. Hot branding must be conducted in a humane manner and at the discretion of the attending veterinarian or an experienced marine mammal biologist.
   d. To the maximum extent practicable, pinnipeds will be hot branded when their fur is dry and will be released into the water post-branding as soon as safely possible.
   e. Minimum animal sizes/ages for ESA-listed species include:

[1]Conducted under Appendix 1, Table 1. Take, import, and export of live marine mammals must be done in a humane manner. Under the MMPA, the term "humane" means *that method of taking which involves the least possible degree of pain and suffering practicable to the mammal involved*.

- Steller sea lions: pups ≥ 20 kg.
- Guadalupe fur seals: pups ≥ 6 months of age or ≥12 kg.
- Ringed and bearded seals: pups without a lanugo coat (approximately >1 mo of age).

7) Unmanned Aircraft Systems (UAS):
   a. To the maximum extent practicable, UAS altitude adjustment and horizontal movements should be made away from the animals or conducted slowly when above the animals to minimize disturbance.
   b. The UAS should hover over an individual only long enough to obtain the needed data or samples to achieve the permitted objectives.

8) Vaccinations:
   a. Only dead/inactivated and recombinant vaccines may be used (no live vaccines).
   b. Prior to using vaccinations in the wild for enhancement purposes (Appendix 1, Table 1), safety testing (Appendix 1, Table 2) must occur in captivity or during rehabilitation on the target species or most closely related surrogate species possible.
      i. Testing must occur on ≥ 5 captive animals and vaccinated animals must be observed for 90 days in captivity for adverse reactions before use on ESA-listed species in the wild.
      ii. Efficacy testing must be conducted to the maximum extent feasible prior to use on ESA-listed species in the wild.
      iii. In the event of needing to vaccinate before testing on 5 animals or the 90 day observation period, the Permit Holder must consult with the Permits Division.
      iv. If testing results show any response that may negatively affect fitness of an animal, no vaccinations will be administered to wild animals.
   c. The Permit Holder must receive approval from the Permits Division prior to use of vaccines in the wild for enhancement purposes.

9) In order to avoid, minimize, or eliminate impacts on the affected species, non-target species, and the environment, mitigation measures described in Chapter 5 of the PEIS must be followed for the activities authorized by this permit: http://www.nmfs.noaa.gov/pr/pdfs/health/eis_chapter5.pdf. These mitigation measures must also be followed with regard to ensuring human health and safety.

Biological Sampling during All Research and Enhancement Activities[2]

1. Only highly experienced and well-trained personnel may perform intrusive procedures (including but not limited to biopsy, blood sampling, and tagging). A veterinarian or their designee must be present if animals will be sedated or anesthetized.

2. Biological samples must be collected from live animals in a humane manner (i.e., that which involves the least possible degree of pain and suffering).

3. Sterile, disposable needles, biopsy punches, etc. must be used to the maximum extent possible (always use sterile or sterile disposable needles for blood sampling and injections of drugs or other approved substances).

4. When disposables are not available, all instruments (e.g., biopsy tips) must be cleaned and disinfected using non-toxic and non-irritating disinfectants between and prior to each use.

5. In order to avoid, minimize, or eliminate impacts on the affected species, non-target species, and the environment, mitigation measures described in Chapter 5 of the FEIS must be followed for the biological sampling activities authorized by this permit: http://www.nmfs.noaa.gov/pr/pdfs/health/eis_chapter5.pdf. These mitigation measures must also be followed with regard to ensuring human health and safety.

6. Authorized personnel working with marine mammals and marine mammal parts are encouraged to report to the Permit Holder any illness resulting from zoonotic disease transmission. This information should be included in the annual report.

7. Biological samples must be collected, maintained, and transferred in accordance with Appendix 9.

[2] Conducted under Appendix 1, Tables 1 and 2.

Cetacean Response-Related[3] and Baseline Health[4] Research Conditions

Counting and Reporting Cetacean Research Takes

2) Any "approach"[5] to a cetacean constitutes a take and must be counted and reported regardless of whether an animal reacts.
3) Regardless of success, any attempt to tag/sample/ultrasound an animal, including the associated close approach, constitutes a take and must be counted and reported.
4) Any marine mammal observed during sound playback must be counted as a take by harassment and reported.
5) During aerial surveys, any cetacean observed from an altitude below 1,000 ft must be counted and reported as a take.
6) No individual animal may be taken more than 3 times in one day.

General Cetacean Research Conditions

7) To minimize disturbance of the subject animals Researchers must exercise caution when approaching animals and must retreat from animals if behaviors indicate the approach may be interfering with reproduction, feeding, or other vital functions.
8) Where females with calves are authorized to be taken, Researchers:
    a. Must immediately terminate efforts if there is any evidence that the activity may be interfering with pair-bonding or other vital functions;
    b. Must not position the research vessel between the mother and calf;
    c. Must approach mothers and calves gradually to minimize or avoid any startle response;
    d. Must not approach any mother or calf while the calf is actively nursing; and
    e. Must, if possible, sample the calf first to minimize the mother's reaction when sampling mother/calf pairs.
9) Any activity must be discontinued if an animal exhibits a strong adverse reaction to the activity or the vessel (e.g., breaching, tail lobbing, underwater exhalation, or disassociation from the group).

Active Acoustics

10) Playback studies must be limited to 20 minutes in duration, not exceed 155 dB re 1 µPa at 1 meter, and must not be broadcast to animals closer than 100 meters.

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[3] Conducted under Appendix 1, Table 1. Take, import, and export of live marine mammals must be done in a humane manner. Under the MMPA, the term "humane" means *that method of taking which involves the least possible degree of pain and suffering practicable to the mammal involved*.

[4] Conducted under Appendix 1, Table 2. Take, import, and export of live marine mammals must be done in a humane manner.

[5] An "approach" is defined as a continuous sequence of maneuvers (episode), involving a vessel or researcher's body in the water, including drifting, directed toward a cetacean or group of cetaceans closer than 100 yards for large whales, or 50 yards for smaller cetaceans.

Cetacean Manned Aerial Surveys

11) Manned aerial surveys must be flown at an altitude of at least 750 ft for cetacean species.
12) To minimize disturbance: If an animal shows a response to the presence of the aircraft, the aircraft must leave the vicinity and either resume searching or continue on the line-transect survey.
13) During cetacean aerial surveys, flights over pinniped rookeries must be flown at an altitude above 1000 ft.

Unmanned Aircraft Systems (UAS)

14) To the maximum extent practicable, UAS altitude adjustment and horizontal movements should be made away from the animals or conducted slowly when above the animals to minimize disturbance.
15) The UAS should hover over an individual only long enough to obtain the needed data or samples to achieve the permitted objectives

Underwater Filming and/or Photography

16) No more than 2 divers are authorized to be in the water at any time during underwater observations. An underwater approach/activity must be terminated if a whale is observed to exhibit adverse/evasive changes in behavior. Use of an additional diver is subject to review and approval by the NMFS Permits Division.
17) Only Research Assistants that are trained photographers, videographers, or safety divers may conduct underwater activities.

Sampling Activities: Remote Biopsy, Tagging, Ultrasound

18) All biopsy tips must be cleaned and disinfected between and prior to each use.
19) Small cetacean calves: Researchers may only biopsy sample or tag calves 1 year or older and females accompanied by these calves.
    Large cetacean calves: Researchers may only biopsy sample or tag calves 6 months of age or older, and females accompanied by these calves.
20) Before attempting to sample an individual, Researchers must take reasonable measures (e.g., compare photo-identifications) to avoid repeated sampling of any individual.
21) Researchers may not attempt to biopsy or tag a cetacean anywhere forward of the pectoral flipper.
22) To the maximum extent practicable, remote biopsy procedures performed on live Cook Inlet beluga whales must comply with the 2015 Guidance to Parties Interested in Conducting Biopsies on Cook Inlet Beluga Whales (2015) and any updates or revisions (http://alaskafisheries.noaa.gov/protectedresources/whales/beluga/workshop/guidancebiopsyworkshop0115.pdf).

Small Cetacean Captures

23) Cook Inlet beluga whales, main Hawaiian Islands insular false killer whales, and Southern Resident killer whales may not be captured for research purposes. These species may only be captured if there is an unusual mortality event, oil

spill, or other emergency health threat necessitating intervention (Appendix 1, Table 1).

24) At least 1 veterinarian must be present at all times during capture, sampling, and release operations.
25) No more than 5 animals may be captured in a net set at a time. In the event that more than 5 dolphins are captured, the additional animals must be immediately released unless the attending veterinarian determines that doing so could have a negative impact on individual dolphins.
26) Capture-release activities should be limited to waters 2 meters (6 feet) deep or less in order to ensure the safety of the dolphins and capture team when feasible. If working in in water greater than >2 m, every effort must be made to capture no more than two (2) animals at a time during a set.
27) For shallow-water sets (less than 6 feet deep), a minimum of 3 researchers per dolphin must be in the water to ensure the safety of the animals and the researchers. This does not include individuals processing animals and undertaking other responsibilities besides securing dolphins.
28) The maximum amount of time any dolphin may be held (capture to release) is 4 hours.
29) Calves less than one year of age, as determined by size, and animals accompanied by such calves must not be captured.
30) Pregnant females in their 3rd trimester must not be placed on the processing (medical) boat or otherwise restrained in a manner that could cause stress or injury.
31) For new field sites, the capture boat operator must be on site for an appropriate period of time before capture-release operations to become familiar with the habitat and local waters.
32) When working up captured animals, Researchers must:
    a. Minimize handling time;
    b. Keep animals cool and wet during triage and/or transport;
    c. Immediately cease research-related procedures if an animal is showing signs of acute stress (e.g., overexertion, constant muscle tension, abnormal respiration or heart rate, etc.) that may lead to serious injury, capture myopathy, other disease conditions, or death.
33) Researchers must remove the net from the water as quickly as possible, and closely examine the net during and after captures to ensure that no animals have been left in the net.
34) Researchers must physically lift the float line to ensure that an animal is not entangled in the net.
35) The PI must coordinate research activities conducted under the authority of this permit with other permit holders working on the same species to avoid unnecessary duplication of research and disturbance of animals, including:
    a. Geographic location and seasonality of sampling sites; and
    b. A unique freeze-branding numbering system.
36) Auditory testing must be conducted in a manner to minimize handling time.

Researchers must also adhere to applicable conditions in Appendix 8 regarding auditory testing.

37) During beluga whale research captures, an animal must not be handled more than 60 minutes, with no more than 30 minutes in a sling.

38) For non-target protected species in area during small cetacean captures:
    a. Netting must not be initiated when non-target marine mammals or sea turtles are observed within the vicinity of the research. These non-target species must be allowed to either leave or pass through the area safely before netting is initiated.
    b. Researchers must make every effort to prevent interactions with non-target protected species and should be aware of the presence and location of these animals during netting activities.
    c. Should any non-target protected species become captured, researchers must free the animal as soon as possible without endangering target animals in the net.
    d. In accordance with Conditions A.2 and E.2, any captures of non-permitted, non-target species must be reported to the Chief, Permits Division (301-427-8401), and the Permit Holder must request permission to resume.

Non-target Species

39) If a right whale is observed in the area during the course of activities authorized under this permit, Researchers must maintain a distance of at least 460 meters (500 yards) and immediately report the sighting and location data to either the U.S. Coast Guard, New England Aquarium, or the NMFS Regional Administrator.

40) If a humpback whale is observed in Alaska or Hawaii during the course of activities authorized under this permit, Researchers must maintain a distance of at least 91.4 meters (100 yards). In Hawaii, aircraft must maintain a distance of at least 300 meters (1,000 feet).

41) To minimize disturbance of Hawaiian monk seals during cetacean research activities occurring in the Hawaiian Islands the Permit Holder must:
    a. Consult with the NMFS monk seal research program and the U.S. Fish and Wildlife Service (USFWS) at Midway for approval of any land-based activities to avoid harassment of monk seals;
    b. Not enter the water when monk seals are present, and if approached by a seal, leave the area; and
    c. Report any opportunistic monk seal sightings to: Thea.Johanos-Kam@noaa.gov.

42) In order to avoid, minimize, or eliminate impacts on the affected species, non-target species, and the environment, mitigation measures described in Chapter 5 of the PEIS must be followed for the activities authorized by this permit: http://www.nmfs.noaa.gov/pr/pdfs/health/eis_chapter5.pdf. These mitigation measures must also be followed with regard to ensuring human health and safety.

Research in the Inland Waters of Washington, Hawaii, and Alaska:

43) At all times when vessels engaging in research activities are in the inland waters of Washington, such vessels must fly a clearly visible triangular pennant. The pennant must be yellow in color with minimum dimensions of 18"H x 26"L and with the permit number displayed in 6" high black numerals.

44) At all times when vessels engaging in Hawaiian humpback research activities are on the water ("port-to-port") in Hawaii, such vessels must fly a clearly visible triangular pennant. The pennant must be yellow in color with minimum dimensions of 18"H x 26"L and with the permit number displayed in 6" high black numerals.

45) Bowhead whale research activities authorized herein must not be conducted in a manner or at a time that will interfere with the Native Alaskan subsistence harvest.

Vaccinations

46) Only dead/inactivated and recombinant vaccines may be used (no live vaccines).
47) Prior to using vaccinations for enhancement purposes (Appendix 1, Table 1), safety testing (Appendix 1, Table 2) must occur in captivity or during rehabilitation on the target species or most closely related surrogate species possible.
    a. Testing must occur on $\geq$ 5 captive animals and vaccinated animals must be observed for 90 days in captivity for adverse reactions before use on ESA-listed species in the wild.
    b. Efficacy testing must be conducted to the maximum extent feasible prior to use on ESA-listed species in the wild.
    c. In the event of needing to vaccinate before testing on 5 animals or the 90 day observation period, the Permit Holder must consult with the Permits Division.
    d. If testing results show any response that may negatively affect fitness of an animal, no vaccinations will be administered to wild animals.
48) The Permit Holder must receive approval from the Permits Division prior to use of vaccines in the wild for enhancement purposes.

Pinniped (excluding walrus) Response-Related[6] and Baseline Health[7] Research Conditions

1) Researchers must carry out activities quickly and efficiently and use biologists experienced in capture and sampling techniques to reduce disturbance of rookeries, haul-outs, and colonies, and to minimize handling/restraint time.

2) Researchers must capture and handle pinnipeds in groups small enough that individual animals can be adequately monitored.

3) Efforts to approach (by ground, vessel, or manned or unmanned aircraft) or handle a pinniped must be immediately terminated if there is any evidence that the activities may be life-threatening to the animal or non-target animals in the vicinity.

4) Researchers must immediately cease research-related procedures if a captured pinniped is showing signs of acute or protracted alarm reaction (e.g., overexertion, constant muscle tensions, abnormal respiration or heart rate) that may lead to serious injury, capture myopathy, other disease conditions, or death; and monitor or treat the animal as determined appropriate by the PI, CI, or attending veterinarian.

5) Researchers must ensure that pinnipeds that have been captured or are recovering from immobilizing drugs have an opportunity to recover without undue risk of drowning or injury from other animals.

6) Researchers must exercise caution when approaching all pinnipeds, particularly mother/pup pairs. Researchers must take reasonable steps to identify pregnant and lactating females to avoid disturbing them.

7) If a lactating female dies as a result of the research activities and her dependent pup can be identified, Researchers must immediately coordinate a response with the NMFS Regional Stranding Network Coordinator.

8) To the maximum extent practical, without causing further disturbance of pinnipeds, researchers must monitor study sites following any disturbance (e.g., surveys or sampling activities) to determine if any pinnipeds have been killed or injured or pups abandoned. Any observed serious injury to or death of a pinniped, or observed abandonment of a dependent pinniped pup, must be reported as

[6] Conducted under Appendix 1, Table 1. Take, import, and export of live marine mammals must be done in a humane manner. Under the MMPA, the term "humane" means *that method of taking which involves the least possible degree of pain and suffering practicable to the mammal involved*.

[7] Conducted under Appendix 1, Table 2. Take, import, and export of live marine mammals must be done in a humane manner.

indicated above.

9) For Hawaiian monk seals, this permit does not authorize hot branding (Appendix 1, Table 1), vaccinations (Appendix 1, Tables 1 or 2), or capture activities for research on healthy monk seals in the wild (Appendix 1, Table 2).

10) Hot branding pinnipeds:
    a. Hot branding may only be conducted in emergency response or emergency response-related research activities (Appendix 1, Table 1), and not during baseline health research (Appendix 1, Table 2).
    b. The least invasive marking method possible that meets the requirements of the situation will be considered and chosen.
    c. Hot branding must be conducted in a humane manner and on healthy (non-compromised) animals.
    d. To the maximum extent practicable, pinnipeds will be hot branded when their fur is dry and will be released into the water post-branding as soon as safely possible.
    e. Minimum animal sizes/ages for ESA-listed species include:
        - Steller sea lions: pups $\geq$ 20 kg.
        - Guadalupe fur seals: pups $\geq$ 6 months of age or $\geq$12 kg.
        - Ringed and bearded seals: pups without a lanugo coat (approximately >1 month of age).

11) Unmanned Aircraft Systems (UAS):
    a. To the maximum extent practicable, UAS altitude adjustment and horizontal movements should be made away from the animals or conducted slowly when above the animals to minimize disturbance.
    b. If pinnipeds show aversion to the presence of the UAS, Researchers must slowly increase the altitude or distance to minimize disturbance.
    c. The UAS should hover over an individual only long enough to obtain the needed data or samples to achieve the permitted objectives.

12) Vaccinations:
    a. Only dead/inactivated and recombinant vaccines may be used (no live vaccines).
    b. Prior to using vaccinations for enhancement purposes (Appendix 1, Table 1), safety testing (Appendix 1, Table 2) must occur in captivity or during rehabilitation on the target species or most closely related surrogate species possible.
        i. Testing must occur on $\geq$ 5 captive animals and vaccinated animals must be observed for 90 days in captivity for adverse reactions before use on ESA-listed species in the wild.
        ii. Efficacy testing must be conducted to the maximum extent feasible prior to use on ESA-listed species in the wild.

iii. In the event of needing to vaccinate before testing on 5 animals or the 90 day observation period, the Permit Holder must consult with the Permits Division.
iv. If testing results show any response that may negatively affect fitness of an animal, no vaccinations will be administered to wild animals.

c. The Permit Holder must receive approval from the Permits Division prior to use of vaccines in the wild for enhancement purposes.

13) For non-target protected species in the study area:

a. Researchers must make every effort to prevent interactions with non-target protected species and should be aware of the presence and location of non-target animals if they are observed in the study area.

b. For in-water captures, netting must not be initiated when non-target marine mammals or sea turtles are observed within the vicinity of the research. These non-target species must be allowed to either leave or pass through the area safely before netting is initiated.

c. Should any non-target protected species become captured in nets, Researchers must free the animal(s) as soon as possible without endangering other animals in the net.

d. In accordance with Conditions A.2 and E.2, any captures of non-permitted, non-target species must be reported to the Chief, Permits Division (301-427-8401), and the Permit Holder must request permission to resume.

14) In order to avoid, minimize, or eliminate impacts on the affected species, non-target species, and the environment, mitigation measures described in Chapter 5 of the PEIS must be followed for the activities authorized by this permit: http://www.nmfs.noaa.gov/pr/pdfs/health/eis_chapter5.pdf. These mitigation measures must also be followed with regard to ensuring human health and safety

Conditions for Response-Related[8] and Baseline Health[9] Research Conditions on Marine Mammals undergoing Rehabilitation

1) Marine mammals undergoing rehabilitation that are used in scientific research studies authorized by this permit must be maintained in facilities that are current Stranding Agreement (SA) holders or designees or 109(h) responders, in accordance with applicable regulations and the *"Policies and Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release"* (hereinafter "*NMFS Policies and Best Practices*") found at: http://www.nmfs.noaa.gov/pr/pdfs/health/eis_appendixc.pdf.

2) To the maximum extent feasible, research must not interfere with the rehabilitation of the stranded animals, and should be done concurrently with other medical or husbandry procedures to limit human contact.

3) Research activities must be approved by, coordinated with, and monitored by the attending veterinarian of that facility.

4) Animals undergoing research must be closely monitored to determine if research activities are having an adverse effect on the individuals. The attending veterinarian must be available for emergencies, illnesses, and for treating any health problems associated with the authorized procedures.

5) The SA holder, their designee, and the attending veterinarian have the right to suspend and direct research activities at any time.

6) Rehabilitating animals that will be temporarily transferred to a research facility and later released may only be transferred to facilities that are registered as research facilities by the U.S. Department of Agriculture, Animal and Plant Health Inspection Service. The animal must be quarantined from captive animals at the research facility.

[8] Conducted under Appendix 1, Table 1. Take, import, and export of live marine mammals must be done in a humane manner. Under the MMPA, the term "humane" means *that method of taking which involves the least possible degree of pain and suffering practicable to the mammal involved*.

[9] Conducted under Appendix 1, Table 2. Take, import, and export of live marine mammals must be done in a humane manner.

Conditions for Research and Enhancement Activities[10] on Permanently Captive Marine Mammals

1) Marine mammals used in captive research or enhancement must be maintained in U.S. Department of Agriculture, Animal and Plant Health Inspection Service (APHIS) registered research facilities and/or licensed display facilities and in compliance with the provisions of the Animal Welfare Act (AWA) and AWA implementing regulations. A copy of the APHIS research registration and/or license for any facility to be used must accompany this permit.

2) No captive marine mammal may be released into the wild unless such a release has been authorized under an amendment to this permit or a separate scientific research/enhancement permit issued for that purpose.

3) Animals must be transported in accordance with the AWA regulations, "Specifications for the Humane Handling, Care, Treatment, and Transportation of Marine Mammals" (9 CFR Part 3, Subpart E).

4) Prior to transport of any captive animal authorized under this permit, the Permit Holder must submit a completed Marine Mammal Transfer/Transport Notification Form to the Office Director 15 days prior to transport; and APHIS must approve the facility receiving the animal under the AWA (9 CFR Part 3).

5) Public display of animals incidental to research/enhancement authorized under this permit is authorized provided the public display:
   a) is conducted incidental to and will not interfere with the research or enhancement;
   b) is conducted in a manner consistent with provisions applicable to public display;
   c) is approved by the Director, Office of Protected Resources;
   d) occurs as part of an educational program with the following components, as applicable:
      i) a description of the research and enhancement activities;
      ii) an identification of the status of the species under the ESA; and
      iii) information regarding the natural history, distribution, population status, and threats to the ESA-listed species.

6) All procedures must be conducted in the least intrusive manner possible and, whenever possible, concurrent with the routine care and husbandry of the animals. To the maximum extent feasible, animals should be trained for voluntary blood sampling and other medical and husbandry procedures. Anesthesia and/or sedation must be provided to the animals, as deemed necessary and appropriate by the attending veterinarian, to minimize/eliminate pain and discomfort.

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[10] Conducted under Appendix 1, Tables 1 or 2. Take, import, and export of live marine mammals must be done in a humane manner. Under the MMPA, the term "humane" means *that method of taking which involves the least possible degree of pain and suffering practicable to the mammal involved*.

7) Researchers must closely monitor the subject animals to determine if research/enhancement activities are having an adverse effect on the individuals. Researchers must halt and re-evaluate the research/enhancement should animals exhibit signs of excessive stress, pain, or suffering resulting from the authorized activities. The attending veterinarian must be available for emergencies, illnesses, and for treating any health problems associated with the authorized procedures.

Auditory Measurements for Research and Enhancement Purposes[11]

1) Unless such methods are considered standard diagnostic procedures for a particular species (i.e., have been validated with baseline normal values for comparison), auditory testing authorized in this permit on stranded, entrapped, entangled, or rehabilitating marine mammals is considered diagnostic research consistent with Title IV of the MMPA and enhancement under Section 10 of the ESA. Testing must be conducted in consultation with the NMFS Regional Stranding Coordinator.

2) For stranded, entrapped, entangled, or rehabilitation marine mammals, the Stranding Agreement (SA) holder or designee and the attending veterinarian must approve the procedures. The SA holder, their designee, and the attending veterinarian have the right to suspend and direct activities at any time.

3) The attending veterinarian must determine that an animal is stable for testing and, where practicable, that an animal is not pregnant.

4) No auditory testing is authorized on pregnant female animals (where the pregnancy is known/has been confirmed by the attending veterinarian), on mother/calf pairs, or on lone calves less than 6 months old. An exception may only be authorized by the PI or designee.

5) Auditory testing must not delay or interfere with treatment, transport, or release of stranded animals. No animal is to be maintained on the beach or in any stranding situation longer than necessary.

6) Auditory testing must be conducted in a humane manner and in a manner that minimizes restraint time and handling stress. If an animal is suffering, showing adverse reactions, or is at risk of injury during the auditory measurements or handling, Researchers must immediately discontinue the activities.

7) The euthanasia of a stranded animal must not be delayed for purposes of auditory testing for a time period beyond that determined to be humane by the attending veterinarian. If euthanasia is delayed for testing, the animal must be under sedation, analgesia, or anesthesia administered under the direction of the attending veterinarian and authority of the SA holder or designee.

8) Auditory testing on animals that are entangled may only occur after successful disentanglement and in consultation in the NMFS Regional Stranding Coordinator.

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[11] Conducted under Appendix 1, Tables 1 and 2. Take, import, and export of live marine mammals must be done in a humane manner. Under the MMPA, the term "humane" means *that method of taking which involves the least possible degree of pain and suffering practicable to the mammal involved*.

9) Auditory testing may only be conducted if each animal tested is marked prior to release in accordance with the "*Policies and Best Practices for Marine Mammal Stranding Response, Rehabilitation, and Release*" found at: http://www.nmfs.noaa.gov/pr/pdfs/health/eis_appendixc.pdf.

10) The results and interpretation of audiometric data taken on each animal must become a part of the subject animal's medical records maintained by the SA holder or designee.

11) Auditory testing conducted on animals captured under the authority of other research permits must be conducted under direction and supervision of an attending veterinarian.

12) Researchers must provide the on-site SA holder or designee with a brief written report summarizing the auditory testing activities conducted on stranded, entrapped, or rehabilitating animals within 2 weeks after each testing event. This report should include the following: species; animal ID (i.e., Field ID number and Event ID if part of mass stranding or Unusual Mortality Event); age/sex; health condition; handling methods; sedation/anesthesia; what scenario allowed for testing and reactions to procedures; audiograms of each animal tested; and background noise. If any adverse reactions occurred and testing was halted at any time, a copy of this report must also be sent to the Permits Division at the same time.

Requirements for Marine Mammal Parts/Biological Samples

1) Researchers may, subject to the conditions herein, collect, salvage, receive, analyze, archive, and import/export (world-wide) unlimited numbers and kinds of biological specimens (hard and soft parts, including cell lines) authorized in Tables 1 and 2 of Appendix 1. Sources of samples include, but are not limited to:
    a. Scientific research programs involving animals in the wild authorized by this permit or under separate permit or authorization;
    b. Live animal capture/release as part of a stranding response, disease, emergency response, or die-off investigation of ESA-listed marine mammals in the jurisdictional waters of the U.S., and any marine mammal species abroad under the same circumstances under separate permit or authorization;
    c. Live ESA-listed animals stranded or in rehabilitation in the U.S. and any live marine mammal species stranded or in rehabilitation abroad;
    d. Dead ESA-listed marine mammals found on the beach or at sea in the U.S.; and any dead marine mammal species found on the beach or at sea in a foreign country/waters;
    e. Captive marine mammals held in public display, research, or enhancement, or animals in rehabilitation, when sampling is beyond the scope of normal husbandry or normal rehabilitation practices authorized by this or other permits;
    f. Captive marine mammals held in public display, research, or enhancement during normal husbandry sampling;
    g. Animals directly taken in fisheries in countries where such taking of animals is legal and humane;
    h. Animals killed during legal subsistence harvests;
    i. Animals killed incidental to commercial fishing operations where such take is legal;
    j. Soft parts sloughed, excreted, or discharged by live animals (including blowhole exudate);
    k. Live animals during disease surveillance;
    l. Bones, teeth, or ivory of ESA-listed species found on the beach or on land within ¼ mile of the ocean;
    m. Confiscated animals and parts thereof (e.g., as part of enforcement action); and
    n. Animals legally taken in other permitted activities in the U.S. or abroad.

2) The Permit Holder must comply with the following conditions and the regulations at 50 CFR 216.37 (below), for biological samples acquired or possessed under authority of this permit. The Terms and Conditions of this permit shall remain in effect as long as the biological samples authorized hereunder are maintained under the authority and responsibility of the Permit Holder.

3) Samples must be maintained according to accepted curatorial standards and must be labeled with a unique identifier (e.g., alphanumeric code) that is connected to on-site records/inventory with information identifying the following:
    a. species and, where known, age and sex;
    b. date of collection, acquisition, or import;
    c. type of sample (e.g., blood, skin, bone);
    d. origin and nature of collection (i.e., where collected or imported from and circumstances of collection, e.g., necropsy dead animal); and
    e. legal authorization for original sample collection or import.

4) Biological samples belong to the Permit Holder and may be temporarily transferred to Authorized Recipients designated by the Permit Holder, for analysis or curation related to the objectives of this permit. The Permit Holder remains responsible for the samples, including any reporting requirements.

5) Sample recipients must have authorization pursuant to 50 CFR 216.37 prior to permanent transfer of samples and transfers for purposes not related to the objectives of this permit.

6) Recipients of cell lines must either be designated as a Co-investigator (CI) on this permit or be a holder of or a CI on a permit that authorizes research on marine mammal cell lines.

7) Marine mammal parts/biological samples cannot be bought or sold, including parts transferred pursuant to 50 CFR 216.37.

8) After meeting the permitted objectives, the Permit Holder may continue to possess and use samples acquired under this permit, without additional written authorization, provided the samples are maintained as specified in the permit and findings are discussed in the annual reports.

9) The Permit Holder must not import specimens into the U.S. from marine mammals:
    a. Taken in any high seas driftnet fishery after December 31, 1992;
    b. Deliberately killed for the express purposes of fulfilling this permit;
    c. Taken illegally in the country of origin;
    d. Taken during whaling activities not approved by the International Whaling Commission;
    e. Taken during whaling activities opposed by the U.S.[12]; or
    f. Taken in a directed cetacean fishery opposed by the U.S, including Japanese "drive fisheries."

10) Any specimens of species listed in the Appendices to CITES must be accompanied by valid CITES documentation from the exporting country, and, in

[12] Including samples taken during scientific whaling and commercial hunts after the IWC Whaling Moratorium of 1986.

the case of Appendix I species, and Appendix I and II species collected in the open ocean (i.e., in the marine environment outside of any country's territorial jurisdiction), from the CITES Management Authority of the importing country.

11) All specimens imported into the U.S. must be cleared through a U.S. Fish and Wildlife Service (USFWS) port designated for wildlife and must be accompanied by documentation giving a description of each animal from which specimen materials were taken including, species identification, age, size, sex, reproductive condition; date and location of acquisition; circumstances causing death or nature of specimen collection; and legal authority for original specimen collection.

12) Designated Ports of Entry: Ports of entry designated for the import or export of wildlife and are referred to hereafter as "designated ports" (50 CFR 14.12) and are available on the U.S. Fish and Wildlife Service (USFWS) web site: http://www.fws.gov/le/ImpExp/Designated_Ports.htm. Please notify the USFWS wildlife inspectors at these ports at least 48 hours prior to import or export. To use a port of entry other than the designated ports listed above, the Permit Holder or PI must obtain a Designated Port Exception Permit from the USFWS as required in 50 CFR 14.31 and 14.32.

13) A Wildlife Declaration Form 3-177 (obtained at the port or at the USFWS website: http://www.fws.gov/le/ImpExp/Info_Importers_Exporters.htm) must be filed with the USFWS inspector at the time of importation/exportation. Additional information may be obtained from the USFWS website listed above.

50 CFR 216.37 Marine Mammal Parts

With respect to marine mammal parts acquired by take or import authorized under a permit issued under this subpart:

(a) Marine mammal parts are transferrable if:
(1) The person transferring the part receives no remuneration of any kind for the marine mammal part;

(2) The person receiving the marine mammal part is:
(i) An employee of NMFS, the U.S. Fish and Wildlife Service, or any other governmental agency with conservation and management responsibilities, who receives the part in the course of their official duties;
(ii) A holder of a special exception permit which authorizes the take, import, or other activity involving the possession of a marine mammal part of the same species as the subject part; or
(iii) In the case of marine mammal parts from a species that is not depleted, endangered or threatened, a person who is authorized under section 112(c) of the MMPA and subpart C of this part to take or import marine mammals or marine mammal parts;
(iv) Any other person specifically authorized by the Regional Director, consistent with the requirements of paragraphs (a)(1) and (a)(3) through (6) of this section.

(3) The marine mammal part is transferred for the purpose of scientific research, maintenance in a properly curated, professionally accredited scientific collection, or education, provided that, for transfers for educational purposes, the recipient is a museum, educational institution or equivalent that will ensure that the part is available to the public as part of an educational program;

(4) A unique number assigned by the permit holder is marked on or affixed to the marine mammal part or container;

(5) The person receiving the marine mammal part agrees that, as a condition of receipt, subsequent transfers may only occur subject to the provisions of paragraph (a) of this section; and

(6) Within 30 days after the transfer, the person transferring the marine mammal part notifies the Regional Director of the transfer, including a description of the part, the person to whom the part was transferred, the purpose of the transfer, certification that the recipient has agreed to comply with the requirements of paragraph (a) of this section for subsequent transfers, and, if applicable, the recipient's permit number.

(b) Marine mammal parts may be loaned to another person for a purpose described in paragraph (a)(3) of this section and without the agreement and notification required under paragraphs (a)(5) and (6) of this section, if:
(1) A record of the loan is maintained; and

(2) The loan is for not more than one year. Loans for a period greater than 12 months, including loan extensions or renewals, require notification of the Regional Director under paragraph (a)(6).

(c) Unless other disposition is specified in the permit, a holder of a special exception permit may retain marine mammal parts not destroyed or otherwise disposed of during or after a scientific research or enhancement activity, if such marine mammal parts are:
(1) Maintained as part of a properly curated, professionally accredited collection; or

(2) Made available for purposes of scientific research or enhancement at the request of the Office Director.

(d) Marine mammal parts may be exported and subsequently reimported by a permit holder or subsequent authorized recipient, for the purpose of scientific research, maintenance in a properly curated, professionally accredited scientific collection, or education, provided that:
(1) The permit holder or other person receives no remuneration for the marine mammal part;

(2) A unique number assigned by the permit holder is marked on or affixed to the marine mammal specimen or container;

(3) The marine mammal part is exported or reimported in compliance with all applicable domestic and foreign laws;

(4) If exported or reimported for educational purposes, the recipient is a museum, educational institution, or equivalent that will ensure that the part is available to the public as part of an educational program; and

(5) Special reports are submitted within 30 days after both export and reimport as required by the Office Director under 216.38.

APPENDIX F
VACCINATION RESEARCH AND RESPONSE PLANS

APPENDIX F-1: Pinniped Vaccination Research and Response Plan

1. Vaccination – Background and Justification

Vaccination of animals including wildlife has been used as a management technique for years to eradicate or manage infectious diseases that impact public, domestic animal, and wildlife health (Cross et al 2007, Lombard et al 2007, Meeusen et al 2007). In recent years large national and international wildlife vaccination programs have focused on the control of rabies in a variety of wildlife vectors (Rosatte et al 2009, Mahl et al 2014). Additionally, for some endangered species several vaccination programs have been instituted to protect these small and vulnerable populations including Florida panthers (*Puma concolor coryi*) from disease outbreaks (Cunningham et al 2008), and black-footed ferrets (*Mustela nigripes*), prairie dogs (*Cynomys ludovicianus*), and Hawaiian monk seals (*Monachus schauinslandi*) from emerging threats to specific populations (Rocke et al 2008a-b, Duignan et al 2014).

Disease outbreaks are the occurrence of disease at a time or place (or population) that they do not usually occur, or with a greater frequency than expected in a certain period. Epidemics occur when the disease spreads easily in susceptible populations often causing morbidity and mortality. Severe epidemics may reduce host population density to such an extent that stochastic events or previously unimportant ecological factors may further reduce the host population size (Harwood and Hall 1990). For example, canine distemper dramatically reduced black-footed ferret populations in Wyoming, bringing them to extinction in the wild (Thorne and Williams 1988); and, avian malaria reduced native Hawaiian honeycreeper (*Hemignathus parvus*) populations to such small numbers that many were finally eliminated by predation or habitat loss (Warner 1968).
Additionally, phocine distemper virus (PDV) outbreaks in northern Europe were responsible for a combined loss of 50% of the harbor seal (*Phoca vitulina*) populations in 1988 and 2002 (Harkonen et al 2006). Currently several wildlife vaccination programs exist for endangered species to enhance recovery including black-footed ferret and prairie dog vaccination for plague (*Yersinia pestis*); Florida panthers for feline leukemia virus or implementation being planned for enhancement of recovery in Hawaiian monk seals for morbillivirus and West Nile virus (USFWS 2008, USGS-NWHC 2012, NOAA-NMFS 2014).

Infectious diseases, especially those that are newly introduced to naïve populations of animals, can cause mass illness and death or affect reproductive success over multiple years. For rare species or small isolated discrete population segments with low genetic diversity, the risk of a newly introduced pathogen must be evaluated to determine whether the new disease might result in a significant disease outbreak with significant population impacts. After risk evaluation and modeling, it may be determined that the best means of protecting a population or preventing further spread of the infectious disease among animals may be either vaccination in the face of an epidemic or even prophylactic vaccination if the risk of disease at population levels is unacceptable.

The proposed pinniped vaccination program is designed to address potential infectious disease threats to pinniped species under NMFS' jurisdiction and outline a process to address these threats with vaccination. Although infectious disease does not currently appear to be significantly affecting the survival of any pinniped species, there is the potential for some

infectious diseases such as morbillivirus, West Nile Virus (WNV) or avian influenza to have devastating effects on several endangered, threatened, or highly susceptible pinniped species including but not limited to Guadalupe fur seals (*Arctocephalus townsendi),* Hawaiian monk seals, ice seals-ringed (*Phoca hispida*), ribbon (*Histriophoca fasciata*), bearded (*Erignathus barbatus*) and hooded seals(*Cystophora cristata*), and Pacific and Atlantic harbor seals. Because of these concerns regarding the impact of infectious disease on pinniped species, NMFS is committed to being prepared to evaluate the risks of new or re-emerging pathogens, to be able to rapidly respond to, if not prevent, outbreaks of these perceived viral, bacterial, fungal or parasitic disease threats.

2. Objective, Potential Pathogens, and Vaccines

Objective

The overall objective of this pinniped vaccination plan is to outline the process that would be followed prior to implementation of a pinniped vaccination program in response to an existing or emerging infectious disease threat. The main components of the plan are vaccine selection, captive animal testing for safety and efficacy, pathogen surveillance, and vaccination of free-ranging pinnipeds.

In general, vaccination studies to determine the safety and efficacy of vaccines against specific pathogens considered most likely to spread to pinnipeds (e.g., morbillivirus, WNV, avian influenza, etc.) would be conducted to determine the effectiveness of the vaccine in mitigating or preventing the impacts of the infectious disease and to evaluate any negative effects of the vaccine. If previous safety and efficacy research have not been conducted, captive studies would likely be conducted in collaboration with the managed care veterinarian to determine that the existing or newly developed vaccines are safe and effective for use in pinniped species by initially using surrogate species for ESA or at risk species that are held in captive or rehabilitation facilities. If captive or rehabilitated target species were available these animals would be used as well in the study once initial safety testing is completed or as an initial trial. Once the research indicated that the vaccines were safe and effective, these vaccines might be administered in response to an outbreak or preventatively to wild or rehabilitating pinnipeds. When feasible vaccination risk assessment and modeling studies would have previously determined the effectiveness of the proposed response and prophylactic vaccination protocols for the species in question.

Currently vaccines that have been used or could be used in wildlife have been developed for three viruses that have been identified as potential high risk to pinnipeds: morbillivirus (specific for canine distemper virus and used in monk seals and harbor seals), WNV (used in managed care phocids) and avian influenza (specific to certain types of avian influenza viruses). These viruses and their vaccines will be used as examples for the pinniped vaccination planning procedures as outlined in the Vaccination Plan Procedures section below. However, as new disease threats emerge the same procedures outlined in this plan will be practical to use for any emerging pathogens (other viral, bacterial, fungal or parasitic infectious diseases) that would require vaccination as part of a response or enhancement activity including the development of new vaccines.

Potential Pathogens

Morbilliviruses—Morbilliviruses, specifically phocine distemper virus (PDV) and canine distemper virus (CDV), have caused mass die offs of phocids; however there have been no mass mortality events identified in otariids. Pinnipeds are at risk for both CDV (often from wild or domestic terrestrial carnivores) and PDV. During 1988, approximately 18,000 (70% of the population) harbor seals in Europe died from PDV infection (Heide-Jørgensen et al 1992). A second outbreak of PDV occurred in the North Sea in 2002, which killed over 20,000 harbor seals (Jensen et al 2002). Outbreaks of CDV killed 5-10,000 Baikal seals (*Pusa sibirica*) in 1987-1988 (Grachev et al 1989), 10,000 Caspian seals (*Phoca caspica*) in 2000 (Kennedy et al 2000) and may have been responsible for the deaths of 2,500 crabeater seals (*Lobodon carcinophagus*) in the Antarctic in 1955 (Laws and Taylor 1957). While a morbillivirus was isolated from Mediterranean monk seals (*Monachus monachus*) that died during an epidemic, its importance relative to biotoxins in causing mortality remains controversial (Hernandez et al 1998). Although PDV outbreaks have occurred along the Atlantic coast in the past, to date no PDV outbreak in pinnipeds has occurred in the Pacific. A recent Alaska sea otter (*Enhyrda lutris*) mortality event was associated with PDV (Goldstein et al 2009). Additionally, based upon current data Pacific harbor seals are naïve to PDV (Ham-Lamme et al 1999, Greig et al 2014) and a PDV outbreak might have a large impact on coastal harbor seals along the Pacific coast from Alaska to Southern California. Additionally, sero-surveys conducted on Hawaiian monk seals show no exposure to PDV or CDV in the population (Aguirre et al 2007), thereby making this population exceedingly vulnerable to an outbreak.

West Nile Virus—WNV was introduced into North America in New York and has subsequently spread throughout all contiguous states causing human and avian illnesses and deaths. It has caused the death of a captive monk seal at SeaWorld San Antonio, Texas, and has caused mortality in captive harbor seals on the mainland U.S (Del Peiro et al 2006, Root 2013). To date this virus has not been identified in wild marine mammals, although it is now present seasonally in humans and mosquitoes along the eastern seaboard, Gulf of Mexico and Pacific coast (USGS 2014). This mosquito-borne virus is currently not present within Hawaii and Alaska, and although these two states ramped up surveillance for several years, the effort was not sustained. Although neither single cases of disease nor epidemics of WNV have been reported in wild marine mammals to date, the deaths of Hawaiian monk and harbor seals in captivity indicate phocids are susceptible. Thus, the possibility of mortality in Hawaiian monk seals or Alaska seals exists if the virus were to be introduced to Hawaii or Alaska, warranting a response plan for such a scenario. WNV vaccination is routinely used in managed care pinnipeds in the continental US.

Avian Influenza – Influenza refers to a group of viruses that infect human and animal species around the world. There are three types of influenza viruses: A, B, and C. The most common viruses are influenza A which has caused disease in birds, domestic mammals (e.g., dogs, horses, swine), wild mammals (seals) and humans, and influenza B viruses which cause illness principally in humans. Influenza viruses cause seasonal epidemics of disease in people almost every year globally with periodic outbreaks in swine, dogs, horses, and marine mammals. Influenza A viruses are divided into subtypes based on two proteins on the surface of the virus: hemagglutinin (H) and the neuraminidase (N). There are at least 16 different hemagglutinin subtypes and 9 different neuraminidase subtypes. Subtypes can be species specific and

significant evolution of the virus occurs over time and space; not all subtypes are found in all species. Historically marine mammals have been infected with Influenza A viruses that originated in avian species (Geraci et al 1982, Hinshaw et al 1984, Callan et al 1995, Anthony et al 2012), although infection can may also occur from contact with infected humans or terrestrial mammals, and other marine mammals (Osterhaus et al 2000). There have been four identified mortality events in the U.S. that involved seals (and only harbor seals) and Influenza A viruses:

- 1979-1980 harbor seal mortality event in the NE USA: H7N7 (Geraci et al. 1982)
- 1982-1983 harbor seal mortality event in the NE USA: H4N5 (Hinshaw et al. 1984)
- 1991- 1992: harbor seal mortality event in NE USA: H4N6 and H3N3 (Callan et al. 1995)
- 2011: 2011-2012 harbor seal mortality event in NE USA: H3N8 (Anthony et al. 2012)

Although the H3N8 subtype encompasses the virus responsible for canine and equine influenza, the most recent US seal virus associated with an epidemic is molecularly different from those viruses and appears more similar to the wild bird H3N8 subtype. Therefore the virus is thought to be a direct avian to seal transmission, similar to the other outbreaks in the US. The H3N8 influenza virus isolated from the most recent harbor seal mortality event has exhibited several genetic mutations that may make it more likely for this virus to further infect mammals increasing the potential risk for seal to seal transmission in rehabilitation centers (Anthony et al 2012) or in the wild on haul-outs or rookeries. Recently in 2014 there was a H10N7 influenza outbreak in harbor seals in Denmark and Sweden causing mortality of >1500 seals (CWSS 2014, Zohari et al 2014). Again this involved harbor seals and not as in the cases in the US gray seals. Additionally, sero-surveys during the 1990s and 2000s in U.S. waters in the Pacific and Atlantic have found low prevalence of Influenza A antibodies in harbor seals, harp seals (*Pagophilus groenlandicus*), ringed seals, grey seals (*Halichoerus grypus*), northern elephant seals (*Mirounga angustirostris*), California sea lions (*Zalophus californianus*), and Pacific walrus (*Odobenus rosmarus divergens*). However sero-surveys conducted on Hawaiian monk seals show no exposure to influenza in the population (Aguirre et al 2007), thereby making this population exceedingly vulnerable to an outbreak.

New techniques for serological identification of subtype of antibodies (animal exposures) are currently being validated and will become important in the assessment of actual virus subtype exposure (addressing risks and vaccine identification). In addition there has been recent interest in development of universal influenza vaccines which would be greatly beneficial for wildlife programs. Current studies are underway to evaluate the recent highly pathogenic avian influenzas in wild birds in the Pacific flyway and the potential or actual transmission to pinnipeds from Alaska to California. Studies in lung receptors for influenza viruses have indicated that harbor seals have both mammalian and avian influenza receptors identifying this species as a high probability of co-infections or host for evolution of viruses to a more pathogenic one for mammals. Studies are underway to better characterize the risks to other pinniped species.

Types of Vaccines

Vaccines currently used for prevention of viral, bacterial, fungal or parasitic diseases in domestic animals can be divided into three types:

- Vaccines using a dead inactivated pathogen;
- Vaccines using live attenuated pathogen; and

- Vaccines using recombinant pathogen.

Vaccines using a dead pathogen are considered the safest because the pathogen cannot replicate in the host or cause the clinical disease; however, this lack of replication often means that the immune response generated following vaccination is short-lived and may not be protective unless boosters are given. Live vaccines typically generate the most effective immune response. When used in species other than the one for which the vaccine was developed, live vaccines may present the risk of the pathogen replicating in the host and either causing disease in the vaccinated animal or being shed in secretions thereby becoming infective to contact animals. Recombinant virus vaccines use a vector virus that does not typically infect or cause disease in the target host but expresses antigens from the pathogen of interest to stimulate an immune response against those targeted pathogen antigens.

Pathogen Specific Vaccines
For WNV an inactivated WNV vaccine (Innovator, Fort Dodge) has been routinely used for vaccinating pinnipeds in managed care facilities. This vaccine has already been used regularly on Hawaiian monk seals in captivity in San Antonio, Texas, with no adverse reactions observed (Braun and Yochem 2006).

For morbillivirus, a recombinant vaccine to CDV (monovalent recombinant canary pox vector expressing CDV antigens, Purevax, Merial) licensed for use in ferrets in the U.S. and used in zoological collections (Bronson et al 2007). Additionally, Merial has recently made a new canary pox vaccine available for use with a different CDV virion level. The original canary pox CDV vaccine is the only currently recommended CDV vaccine by the American Association of Zoological Veterinarians (http://www.aazv.org) for use in wild carnivores. Safety and efficacy trials conducted on captive harbor and Hawaiian monk seals demonstrated no adverse reactions and no shedding of canary pox (Quinley et al 2013, Yochem et al *in prep*) with that original product. All subjects developed positive CDV (though not PDV) titers after receiving a booster approximately one month following initial vaccination. The vaccine has also proven to be a safe and effective prophylactic treatment for captive southern sea otters (Jessup et al 2009). Currently availability of the Purevax CDV vaccine is a limitation to its use, as the product has been on manufacturer backorder for two years. Without greater certainty regarding the vaccine's future availability, development and testing of a new vaccine may be required and the new vaccine offered by Merial with a different CDV virion level appears to be available for further efficacy and safety testing in the near future.

For avian influenza, a recombinant vaccine to equine influenza (bivalent recombinant canary pox vector expressing H3N8 antigens, Recombitek® Influenza Vaccine, Merial) licensed for use in horses in the U.S. (Toulemonde et al 2005, Soboll et al 2010) and also used in dogs (Karac et al 2007) might be tested for safety and efficacy on a surrogate species (e.g. captive harbor seals) if the decision is made to vaccinate against H3N8. This vaccine expresses antigens to the H3N8 equine influenza virus and may provide cross-protection to the H3N8 avian influenza virus that caused the recent mortality event in harbor seals along the Atlantic coast (Anthony et al 2012) however it is not likely to be protective to the new Asian influenza viruses circulating in the Pacific. When a universal influenza A vaccine is developed for humans or domestic animals, it would be the most versatile vaccine to use.

3. Vaccination Plan Procedures

The vaccination plan incorporates four elements: vaccine selection, captive animal testing for safety and efficacy, pathogen surveillance and vaccination of free-ranging pinnipeds and assumes that risk evaluation based on susceptibility or infectivity testing and modeling has indicated a risk to the population. To prepare for and respond to an epidemic caused by morbillivirus, WNV, and avian influenza or to develop prophylactic preventative actions, the following plan is proposed as an example of MMHSRP procedures. As mentioned earlier these procedures might be applied to any new emerging threats which pose significant risks in the future where vaccination is identified as an appropriate tool.

a. Vaccine Selection

The vaccine to be selected would have been tested previously for safety and efficacy in pinnipeds, or a new vaccine would be tested for safety and efficacy. In general we will predominantly use inactivated and recombinant vaccines for the vaccination program.

However, for critically endangered marine mammal populations (<500 animals) we reserve the right to use a modified live vaccine in an outbreak situation that threatens the survival of the species. A modified live vaccine would only be used if an inactivated or recombinant vaccine was not available for the specific pathogen and this modified live vaccine would only be used in the field after safety and efficacy testing in a captive surrogate species had been conducted.

For the three pathogens of interest the following vaccines would be used or tested:

- Inactivated WNV vaccine (Innovator, Fort Dodge) already used safely in harbor seals, Hawaiian monk seals and other pinnipeds.
- Recombinant CDV vaccine (Purevax, Merial) already used safely in harbor seals and Hawaiian monk seals.
    - Either of these two vaccines above could be deployed safely in the face of an outbreak of either disease in pinnipeds.
- Recombinant Equine Influenza vaccine *(*Recombitek® Influenza Vaccine, Merial) to be tested in captive harbor seals.

b. Safety and Efficacy Testing on Captive Animals

-Example Influenza Vaccine

Currently, influenza vaccines have not been tested in pinnipeds. Therefore vaccination of a surrogate species (e.g. captive harbor seals) would be needed to test the proposed recombinant equine influenza vaccine (Recombitek® Influenza Vaccine, Merial) for safety and efficacy. Testing would evaluate the presence of a proper immune response; the number of vaccines (including boosters) needed to generate this response; the duration of immunity against influenza and would follow the methods outlined in Quinley et al (2013). In brief, 5 harbor seals would be vaccinated, and blood samples will be collected prior to vaccination and on days 0, 30, 180 and 365 after vaccination. Additionally, two seals would also receive one booster injection 30 days after the initially vaccination and have a blood sample taken 1 month following the second

vaccination. Vaccination of captive harbor seals would be pursued with our partners, including several aquariums such as Sea World.

-Post-Vaccination Antibody Response Methods for Captive Seals
Captive seals can serve as a model to establish vaccine antibody response for certain vaccines. A study is already underway assessing the post-vaccination antibody response (PVAR) to both the CDV recombinant vaccine (Purevax, Merial) and WNV inactivated vaccine (Fort Dodge) in captive seals.

For new vaccines the following procedures would be followed to test for PVAR:
To assess the effectiveness of the vaccines, serum antibody samples must be taken throughout the year. It is proposed to collect serum on days 0, 28, 42, 182, 365, and annually thereafter to monitor antibody formation from either surrogate or target species in captivity or rehabilitation. Day 0 serum collection will occur prior to vaccination to provide baseline values for each animal. Vaccination will occur after the serum is collected. Along with serum samples, duplicate nasal swabs will be obtained. If determined by the safety and efficacy trials that a booster is needed a second vaccine will be given on the appropriate day depending upon the vaccine type (i.e. day 14, 28, etc.)

c. Surveillance for Pathogens of Concern: To enable detection of novel pathogens in pinniped populations, there is a need to routinely and actively monitor for infectious diseases. Monitoring wild seals for these pathogens may include tests for antibodies against the pathogen in blood (e.g., enzyme linked immunosorbent assays-ELISA), tests for actual pathogens in blood, feces, or nasal swabs (e.g., polymerase chain reaction assays-PCR), and clinical syndrome-based surveillance. Sample and data collection for these tests would be covered by health assessment studies conducted by various NMFS Science Centers (NEFSC, AFSC, PIFSC, etc.), MMHSRP, and other stranding network and research partners.

d. Outbreak and Prophylactic Vaccination Response for Free-Ranging Pinnipeds
A series of different disease parameters in pinnipeds, other marine mammals, and domestic animals have been identified that could trigger a vaccination response (see General Vaccination Response Triggers section). Vaccination of pinnipeds may occur either in response to an outbreak or prophylactically prior to a disease outbreak anywhere within US coastal waters. Depending up the population size impacted or threatened by an outbreak up to 80-95% of the population, or the most vulnerable population segment could be vaccinated if the need were to arise and safe, effective vaccines were available to meet that need. This threshold is based upon the need in general to have an 80-95% immunity rate to achieve herd immunity in a population depending upon the pathogen (Anderson and May 1990, Fine 1993). If this herd immunity threshold is reached then a disease outbreak can be limited and the impact on the population minimized.

MMHSRP proposes to vaccinate in response to disease outbreaks as determined by a series of triggers described below. If the infection risk of morbillivirus, WNV and avian influenza, or a new emerging pathogen in pinnipeds changes from the current situation outlined below, this approach may be modified.

4. General Vaccination Response Triggers

Vaccination response will vary dependent upon the pinniped population at risk and the target pathogen. Vaccination response can be triggered by detection of exposure to the target pathogen or presence of clinical disease in pinnipeds, other marine mammals, or in wildlife and domestic animals. Detection of pathogen exposure, pathogen transmission, and clinical disease will vary with the target pathogen and will influence the triggers used for vaccination.

Below are examples of trigger procedures for a generic pathogen that is spread by direct contact or inhalation (such as morbillivirus or avian influenza), and a vector-borne pathogen (such as WNV) in target pinniped species, non-target marine mammals, and other animals. For our purposes target pinniped species could include but are not limited to: Guadalupe fur seals, Hawaiian monk seals, ice seals including ringed, ribbon, bearded and hooded seals, and Pacific and Atlantic harbor seals. Non-target marine mammals are species that could have contact with target species thereby spreading disease and could include: California sea lions, Steller sea lions (*Eumetopias jubatus*), northern fur seals (*Callorhinus ursinus*), northern elephant seals, grey and harp seals and some small odontocete species especially for morbillivirus. Lastly, wildlife and domestic animals include terrestrial or avian species that are capable of interacting with and spreading the disease to target or non-target marine mammals or their environment. Again as mentioned earlier these procedures or a modified version will be applied to any new emerging pathogens in the future where vaccination is needed for response.

Each vaccination response is made by weighing the advantages and disadvantages, and recognizing that a second trigger occurring during a response may increase the level of response. Detection of antibody to a pathogen implies that exposure is occurring, but lack of clinical disease would imply that the pathogen is not causing illness in the population. Thus vaccination response for pathogen exposure without disease would be at a lower level than that to a confirmed case of disease.

All vaccination responses would be maintained as needed to respond to an outbreak. All vaccinated animals would be marked with flipper tags as well as other markings (dye marks, brands, satellite tags, etc.) as determined by the response team based upon the distance at which seals would need to be re-sighted. As feasible, re-sight surveys will be conducted to monitor vaccinated animals. Additionally, during the response phase, surveillance for the target pathogen through necropsy of dead animals and blood and body fluid testing of handled (wild caught and rehabilitated) live animals will be prioritized by MMHSRP. Lastly, 6-12 months post-response phase targeted capture-release health assessments of a sub-set of vaccinated animals will be conducted to test animals for antibody titers.

Below are general case definitions for generic pathogens outlining the differences between confirmed and suspect cases of disease and cases of only pathogen exposure.

General Pathogen Case Definitions
Confirmed Case: A dead or live animal with CONFIRMED histopathological lesions or clinical signs compatible with the pathogen AND presence of the pathogen in tissues via PCR with confirmed nucleic acid sequencing, culture, OR immunohistochemistry testing.

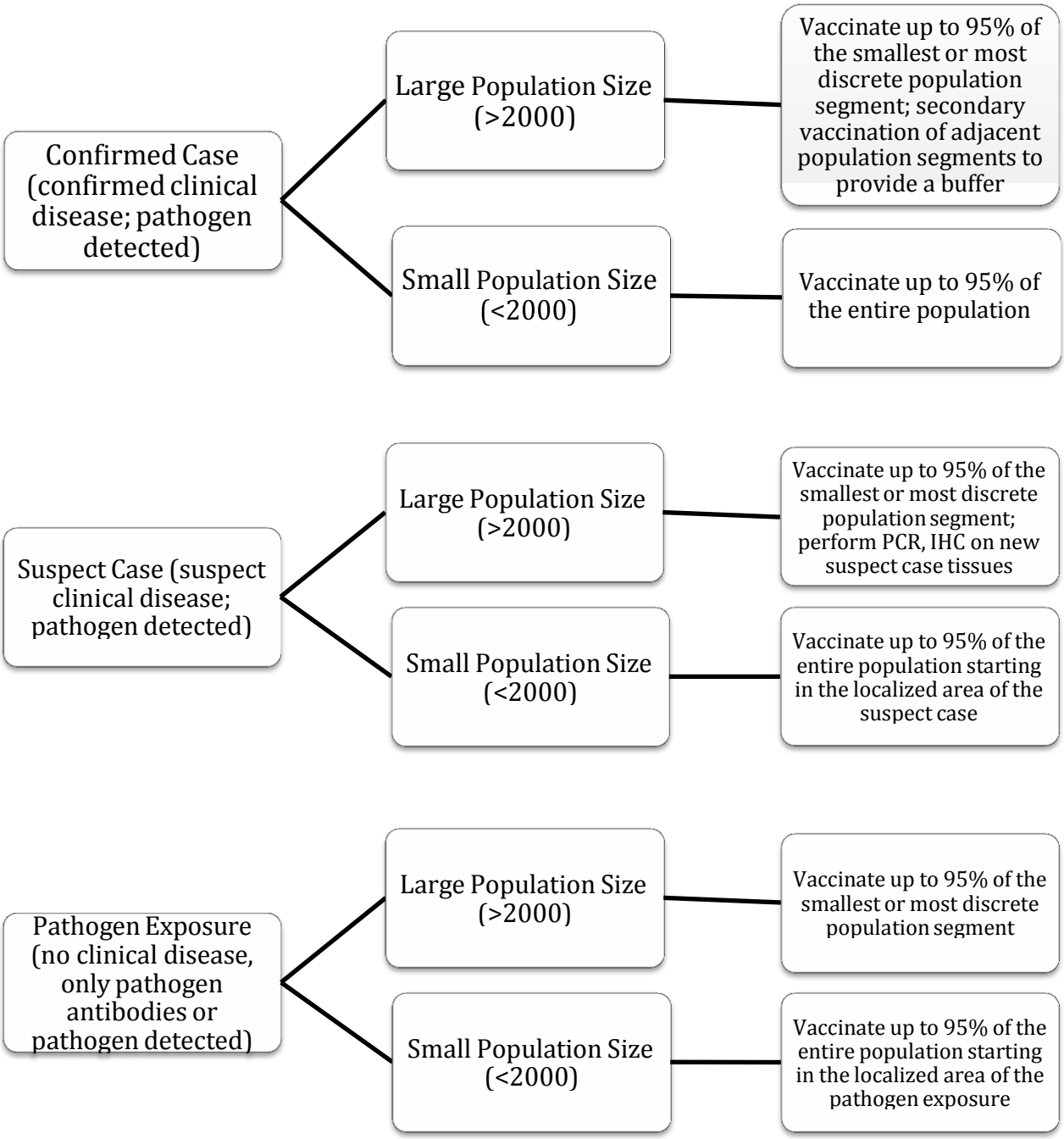
Suspect Case: A dead or live animal with SUSPECT histopathological lesions or clinical signs compatible with the pathogen AND presence of the pathogen in tissues via PCR with confirmed nucleic acid sequencing, culture, OR immunohistochemistry testing.

Pathogen Exposure: A dead or live animal with NO histopathological lesions or clinical signs compatible with the pathogen BUT presence of the pathogen in tissues via PCR with confirmed nucleic acid sequencing, culture, OR immunohistochemistry testing OR presence of antibody titers in blood indicating pathogen exposure.

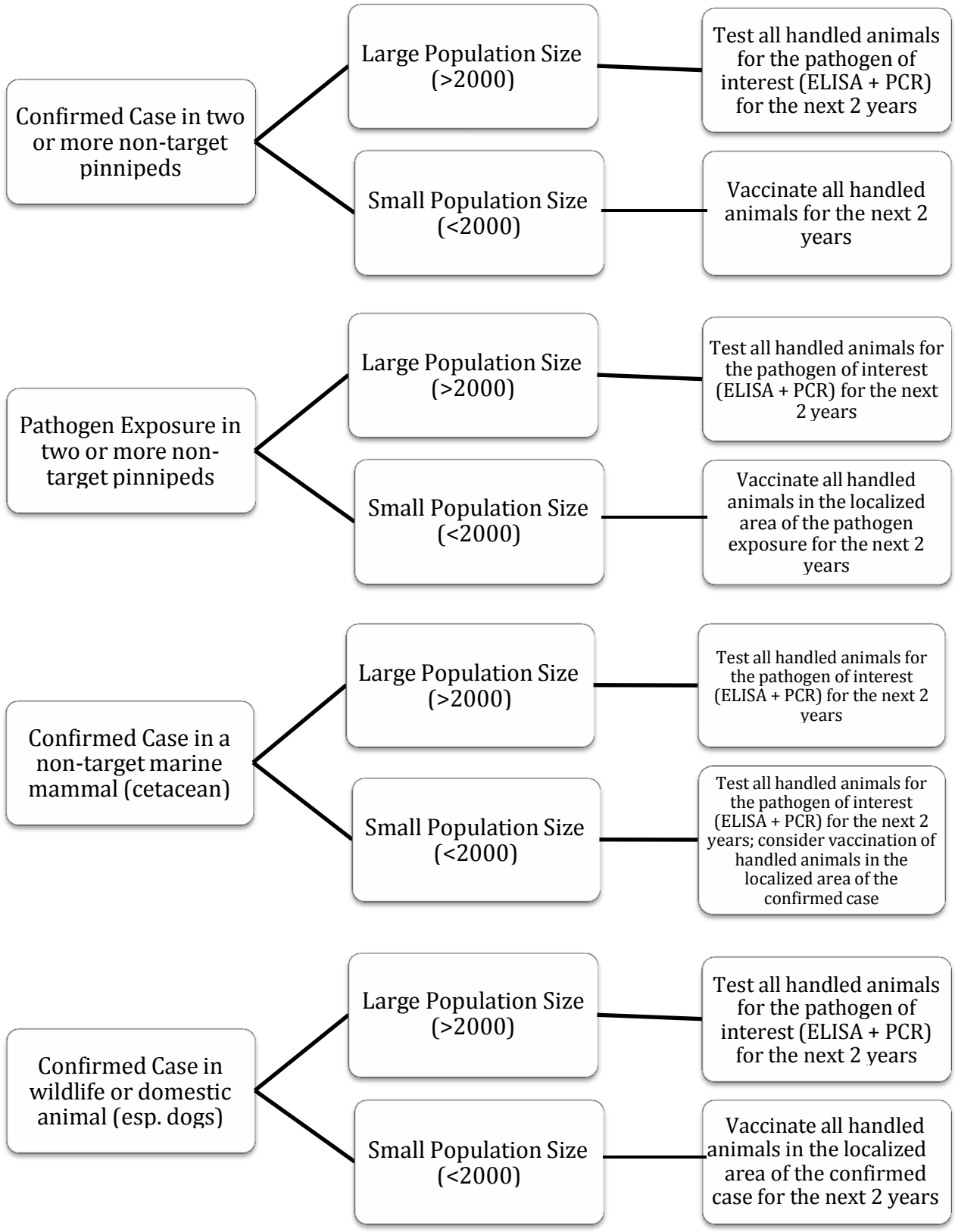
General Prophylactic Vaccination

The best way to protect target pinnipeds against these infectious pathogens is to vaccinate prior to population-wide exposures. This is especially true if multiple doses of vaccines are required to gain immunity against infections, or if immunity responses take weeks to months to develop. Conversely, vaccines that mount short-term responses against infections or have higher risks of side effects may best be delivered only in the face of population-wide exposures. Based upon the information gained from research and any outbreak response, it will be determined whether prophylactic or solely response-driven vaccinations against target pathogens will be needed to protect pinniped populations at risk. Prophylactic vaccination would initially be implemented by vaccinating any live pinnipeds handled in rehabilitation or during live capture-release projects to begin to build herd immunity within the populations at risk.

Triggers for a Direct Contact or Inhalation Pathogen Detected in a Target Pinniped



Triggers for a Direct Contact or Inhalation Pathogen Detected in a Non-Target Species



Results of the response to the first trigger event will be used to refine responses to subsequent trigger events. In particular, records will be taken on:

- Time between trigger and administration of vaccine;
- Number of pinnipeds vaccinated;
- Time required to vaccinate all or most animals of interest;
- Age distribution of vaccinated animals; and
- Re-sightings of vaccinated animals
- Any indication of adverse reaction to vaccination.

Triggers for a Vector-Borne Pathogen Detected in a Target or Non-Target Species

Example: WNV in Hawaii
The epidemiology of WNV differs significantly from that of avian influenza or morbilliviruses, as it is a vector borne zoonotic virus rather than a pathogen spread by inhalation or direct contact. To date this virus has not been identified in wild marine mammals, although it is present in humans and mosquitoes along the Atlantic coast, Gulf of Mexico and Pacific coast. This mosquito-borne virus is currently not present within Hawaii; the State has rigorous surveillance and response plans for controlling this virus due to its public health importance. Although neither single cases of disease nor epidemics of WNV have been reported in wild marine mammals to date, the death of a monk seal in Texas and harbor seals from this infection indicates phocids are susceptible. Thus, the possibility of extensive mortality in monk seals exists if the virus were to be introduced to Hawaii, warranting a response plan to such a scenario

Trigger
A case of WNV in the Hawaiian Archipelago in humans, domestic animals, or wildlife, with activation of the State emergency response for WNV control, could trigger implementation of WNV vaccinations in wild Hawaiian monk seals.

Response
As vaccination of Hawaiian monk seals to WNV has occurred with proven safety for over 5 years in 8 captive monk seals in Texas, the risk of vaccination against WNV is minimal, apart from risks associated with approach and injection.

In response to a detected case of WNV in any species in Hawaii, all accessible seals on the main Hawaiian Islands would be vaccinated with WNV vaccine (Innovator, Fort Dodge), starting with the island on which the case was identified. Vaccine would be transported to each Northwestern Hawaiian Island as soon as feasible and used if the expert panel consulted determined it was appropriate.

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APPENDIX F-2 – Cetacean Vaccination Research and Response Plan

1. Vaccination – Background and Justification

Vaccination of animals including wildlife has been used as a management technique for years to eradicate or manage infectious diseases that impact public, domestic animal, and wildlife health (Cross et al. 2007, Lombard et al. 2007, Meeusen et al. 2007). In recent years large national and international wildlife vaccination programs have focused on the control of rabies in a variety of wildlife vectors (Rosatte et al. 2009, Mahl et al. 2014). Additionally, for some endangered species several vaccination programs have been instituted to protect these small and vulnerable populations including Florida panthers (*Puma concolor coryi*) from disease outbreaks (Cunningham et al. 2008), and black-footed ferrets (*Mustela nigripes*), prairie dogs (*Cynomys ludovicianus*), and Hawaiian monk seals (*Monachus schauinslandi*) from emerging threats to specific populations (Rocke et al. 2008a-b, Duignan et al. 2014).

Disease outbreaks are the occurrence of disease at a time or place (or population) that they do not usually occur, or with a greater frequency than expected in a certain period. Epidemics occur when the disease spreads easily in susceptible populations often causing morbidity and mortality. Severe epidemics may reduce host population density to such an extent that stochastic events or previously unimportant ecological factors may further reduce the host population size (Harwood and Hall 1990). For example, canine distemper dramatically reduced black-footed ferret populations in Wyoming, bringing them to extinction in the wild (Thorne and Williams 1988); and avian malaria reduced native Hawaiian honeycreeper (*Hemignathus parvus*) populations to such small numbers that many were finally eliminated by predation or habitat loss (Warner 1968). Additionally, phocine distemper virus (PDV) outbreaks in northern Europe were responsible for a combined loss of 50% of the harbor seal (*Phoca vitulina*) populations in 1988 and 2002 (Harkonen et al. 2006) and a cetacean morbillivirus outbreak along the Atlantic coast in 1987-88 was responsible for a 50% loss of the coastal migratory stock of bottlenose dolphins (*Tursiops truncatus*; Scott et al. 1988). The current cetacean morbillivirus outbreak along the Atlantic coast in 2013-2015 has been responsible for the death of >1500 bottlenose dolphins from New York to Florida (NOAA-NMFS 2015). Currently several wildlife vaccination programs exist for endangered species to enhance recovery including black-footed ferret and prairie dog vaccination for plague (*Yersinia pestis*); Florida panthers for feline leukemia virus or implementation being planned for enhancement of recovery in Hawaiian monk seals for morbillivirus and West Nile virus (USFWS 2008, USGS-NWHC 2012, NOAA-NMFS 2014).

Infectious diseases, especially those that are newly introduced to naïve populations of animals, can cause mass illness and death or affect reproductive success over multiple years. For rare species or small isolated discrete population segments with low genetic diversity, the risk of a newly introduced pathogen must be evaluated to determine whether the new disease might result in a significant disease outbreak with significant population impacts. After risk evaluation and modeling, it may be determined that the best means of protecting a population or preventing further spread of the infectious disease among animals may be either vaccination in the face of an epidemic or even prophylactic vaccination if the risk of disease at population levels is unacceptable.

The proposed vaccination program is designed to address potential infectious disease threats to species under NMFS' jurisdiction and outline a process to address these threats with vaccination. Although infectious disease does not currently appear to be significantly affecting the survival of any cetacean species, there is the potential for infectious diseases such as morbillivirus to have devastating effects on several endangered, threatened, or highly susceptible species including Cook Inlet Beluga whales (*Delphinapterus leucas*), Hawaiian insular false killer whales (*Pseudorca crassidens*), North Atlantic right whales (*Eugalaena glacialis*), southern resident killer whales (*Orcinus orca*), and small Bay, Sound and Estuary (BSE) stocks of bottlenose dolphins, especially populations with low potential biological removals (PBR). Because of these concerns regarding the impact of infectious disease on species, NMFS is committed to being prepared to evaluate the risks of new or re-emerging pathogens, to be able to rapidly respond to, if not prevent, outbreaks of these perceived viral, bacterial, fungal or parasitic disease threats.

2. Objective, Potential Pathogens, and Vaccines

Objective

The overall objective of this cetacean vaccination plan is to outline the process that would be followed prior to implementation of a cetacean vaccination program in response to an existing or emerging infectious disease threat. The main components of the plan are vaccine selection, captive animal testing for safety and efficacy, pathogen surveillance, and vaccination of free-ranging cetaceans.

In general, vaccination studies to determine the safety and efficacy of vaccines against specific pathogens considered most likely to spread to cetaceans (e.g., morbillivirus, etc.) would be conducted to determine the effectiveness of the vaccine in mitigating or preventing the impacts of the infectious disease and to evaluate any negative effects of the vaccine. If previous safety and efficacy research have not been conducted, captive studies would likely be conducted in collaboration with the managed care veterinarian to determine that the existing or newly developed vaccines are safe and effective for use in cetacean species by initially using surrogate species for ESA or at risk species that are held in captive or rehabilitation facilities. If captive or rehabilitated target species were available these animals would be used as well in the study once initial safety testing is completed or as an initial trial. Once the research indicated that the vaccines were safe and effective, these vaccines might be administered in response to an outbreak or preventatively to wild or rehabilitating cetaceans. When feasible, vaccination risk assessment and modeling studies would have previously determined the effectiveness of the proposed response and prophylactic vaccination protocols for the species in question.

Currently, vaccines that have been used or could be used in wildlife have been developed for one virus that has been identified as potential high risk to cetaceans: cetacean morbillivirus. Morbillivirus and its vaccines will be used as examples for the cetacean vaccination planning procedures as outlined in the Vaccination Plan Procedures section below. However, as new disease threats emerge, the same procedures outlined in this plan will be practical to use for any emerging pathogens (other viral, bacterial, fungal or parasitic infectious diseases) that would require vaccination as part of a response or enhancement activity including the development of new vaccines.

Potential Pathogen: Morbilliviruses—Five types of morbillivirus have been detected in marine mammals in the United States: canine distemper virus (CDV) in seals, phocine distemper virus (PDV) in sea otters and seals, and dolphin morbillivirus (DMV), pilot whale morbillivirus (PWMV), and Longman's beaked whale morbillivirus (LBWMV), which are collectively referred to as cetacean morbillivirus (CMV), that have been found in porpoises, dolphins and whales (Kennedy 1998, DiGuardo et al. 2005, Duignan et al. 2014, Van Bressem et al. 2014). In the United States, there have been morbillivirus mortality events caused by PDV in harbor seals in the northeast (2006) and DMV or PMV in bottlenose dolphins in the northeast in 1987-88 and currently in 2013-2015(Lipscomb et al. 1994, NOAA-NMFS 2015) and Gulf of Mexico (1992 and 1994; Kraftt et al. 1995, Lipscomb et al. 1996). Internationally, there have been outbreaks of morbillivirus in harbor seals in the North Atlantic (1988, 2002; Harkonen et al 2006), in striped dolphins (*Stenella coeruleoalba*) in the Mediterranean (1990-92, 2007-8; Duignan et al 1992, Raga et al 2008) and most recently in bottlenose dolphins in Australia (2009; Stone et al 2011). As mentioned previously the ongoing dolphin morbillivirus outbreak along the Atlantic coast has caused the death of >1500 coastal migratory bottlenose dolphins as well as BSE populations within the Indian River Lagoon and St John's River systems. Besides bottlenose dolphins, other cetacean species testing positive for morbillivirus during this outbreak include striped dolphins, pygmy sperm whales (*Kogia breviceps*), fin whales (*Balaenoptera physalus*), and humpback whales (*Megaptera novaeangliae*; Fauquier et al. 2014).

Types of Vaccines

Vaccines currently used for prevention of viral, bacterial, fungal or parasitic diseases in domestic animals can be divided into three types:

- Vaccines using a dead inactivated pathogen;
- Vaccines using live attenuated pathogen; and
- Vaccines using recombinant pathogen.

Vaccines using a dead pathogen are considered the safest because the pathogen cannot replicate in the host or cause the clinical disease; however, this lack of replication often means that the immune response generated following vaccination is short-lived and may not be protective unless boosters are given. Live vaccines typically generate the most effective immune response. When used in species other than the one for which the vaccine was developed, live vaccines may present the risk of the pathogen replicating in the host and either causing disease in the vaccinated animal or being shed in secretions thereby becoming infective to contact animals. Recombinant virus vaccines use a vector virus that does not typically infect or cause disease in the target host but expresses antigens from the pathogen of interest to stimulate an immune response against those targeted pathogen antigens.

Pathogen Specific Vaccines

Previous studies on vaccination in cetaceans are few (Colgrove 1975) but a recent DNA vaccine against DMV was used in bottlenose dolphins with no adverse effects (Vaughan et al 2007). However the immune response was not very strong and the investigative group has moved in another direction to find a more effective vaccine such as the recombinant vaccine to CDV described below (C. Smith, pers comm).

For morbillivirus, a recombinant vaccine to CDV (monovalent recombinant canary pox vector expressing CDV antigens, Purevax, Merial) is licensed for use in ferrets in the U.S. and is used in zoological collections (Bronson et al 2007). Additionally, Merial has recently made a new canary pox vaccine available for use with a different CDV virion level. The original canary pox CDV vaccine is the only currently recommended CDV vaccine by the American Association of Zoological Veterinarians (http://www.aazv.org) for use in wild carnivores. In general, morbillivirus vaccines offer cross-protection, so a CDV vaccine would provide some protection from a PDV or DMV infection. Safety and efficacy trials conducted on captive harbor and Hawaiian monk seals demonstrated no adverse reactions and no shedding of canary pox (Quinley et al. 2013, Yochem et al *in prep*) with that original product. All subjects developed positive CDV (though not PDV) titers after receiving a booster approximately one month following initial vaccination. The vaccine has also proven to be a safe and effective prophylactic treatment for captive southern sea otters (Jessup et al, 2009). Currently, availability of the Purevax CDV vaccine is a limitation to its use, as the product has been on manufacturer backorder for two years. Without greater certainty regarding the vaccine's future availability, development and testing of a new vaccine may be required and the new vaccine offered by Merial with a different CDV virion level appears to be available for further efficacy and safety testing in the near future.

3. Vaccination Plan Procedures

The vaccination plan incorporates four elements: vaccine selection, captive animal testing for safety and efficacy, pathogen surveillance and vaccination of free-ranging cetaceans and assumes that risk evaluation based on susceptibility or infectivity testing and modeling has indicated a risk to the population. To prepare for and respond to an epidemic caused by morbillivirus or to develop prophylactic preventative actions, the following plan is proposed as an example of MMHSRP procedures. As mentioned earlier these procedures might be applied to any new emerging threats which pose significant risks in the future where vaccination is identified as an appropriate tool.

a. Vaccine Selection
The vaccine to be selected would have been tested previously for safety and efficacy in cetaceans, or a new vaccine would be tested for safety and efficacy. In general we will predominantly use inactivated and recombinant vaccines for the vaccination program.

However, for critically endangered marine mammal populations (<500 animals) we reserve the right to use a modified live vaccine in an outbreak situation that threatens the survival of the species. A modified live vaccine would only be used if an inactivated or recombinant vaccine was not available for the specific pathogen and this modified live vaccine would only be used in the field after safety and efficacy testing in a captive surrogate species had been conducted.

For the pathogen of interest the following vaccine would be used or tested:

- Recombinant CDV vaccine (Purevax, Merial) to be tested in captive bottlenose dolphins.

b. Safety and Efficacy Testing on Captive Animals
-Example Morbillivirus vaccine

Currently, the Recombinant CDV vaccine has not been tested in cetaceans although vaccine trials are underway with one of our partners. Therefore vaccination of a target/surrogate species (e.g. captive bottlenose dolphins) would be needed to test the proposed recombinant CDV vaccine (Purevax, Merial) for safety and efficacy. Testing would evaluate the presence of a proper immune response; the number of vaccines (including boosters) needed to generate this response; the duration of immunity against influenza and would follow the methods outlined in Quinley et al, (2013). In brief, 5 bottlenose dolphins would be vaccinated, and blood samples will be collected prior to vaccination and on days 0, 30, 180 and 365 after vaccination. Additionally, two bottlenose dolphins would also receive one booster injection 30 days after the initially vaccination and have a blood sample taken 1 month following the second vaccination. Vaccination of captive bottlenose would be pursued with our partners, including several aquariums such as Sea World.

-Post-Vaccination Antibody Response Methods for Captive Cetaceans
Captive cetaceans can serve as a model to establish vaccine antibody response for certain vaccines.

For new vaccines the following procedures would be followed to test for PVAR:
To assess the effectiveness of the vaccines, serum antibody samples must be taken throughout the year. It is proposed to collect serum on days 0, 28, 42, 182, 365, and annually thereafter to monitor antibody formation from either surrogate or target species in captivity or rehabilitation. Day 0 serum collection will occur prior to vaccination to provide baseline values for each animal. Vaccination will occur after the serum is collected. Along with serum samples, duplicate blowhole swabs will be obtained. If determined by the safety and efficacy trials that a booster is needed a second vaccine will be given on the appropriate day depending upon the vaccine type (i.e. day 14, 28, etc.)

c. Surveillance for Pathogens of Concern: To enable detection of novel pathogens in cetacean populations, there is a need to routinely and actively monitor for infectious diseases. Monitoring wild cetaceans for these pathogens may include tests for antibodies against the pathogen in blood (e.g., enzyme linked immunosorbent assays-ELISA), tests for actual pathogens in blood, feces, or blowhole swabs (e.g., polymerase chain reaction assays-PCR), and clinical syndrome-based surveillance. Sample and data collection for these tests would be covered by health assessment studies conducted by NMFS Science Centers (SEFSC), NOS, MMHSRP, and other stranding network and research partners.

d. Outbreak and Prophylactic Vaccination Response for Free-Ranging Cetaceans
A series of different disease parameters in cetaceans, other marine mammals, and domestic animals have been identified that could trigger a vaccination response (see General Vaccination Response Triggers section). Vaccination of cetaceans may occur either in response to an outbreak or prophylactically prior to a disease outbreak anywhere within US coastal waters. Depending up the population size impacted or threatened by an outbreak up to 80-95% of the population, or the most vulnerable population segment could be vaccinated if the need were to arise and safe, effective vaccines were available to meet that need. This threshold is based upon the need in general to have an 80-95% immunity rate to achieve herd immunity in a population depending upon the pathogen (Anderson and May 1990, Fine 1993). If this herd immunity

threshold is reached then a disease outbreak can be limited and the impact on the population minimized.

MMHSRP proposes to vaccinate in response to disease outbreaks as determined by a series of triggers described below. If the infection risk of morbillivirus or a new emerging pathogen in cetaceans changes from the current situation outlined below, this approach may be modified.

4. General Vaccination Response Triggers

Vaccination response will vary dependent upon the cetacean population at risk and the target pathogen. Vaccination response can be triggered by detection of exposure to the target pathogen or presence of clinical disease in cetaceans, other marine mammals, or in wildlife and domestic animals when applicable (e.g., wild birds for avian influenza). Detection of pathogen exposure, pathogen transmission, and clinical disease will vary with the target pathogen and will influence the triggers used for vaccination.

Below are examples of trigger procedures for a generic pathogen that is spread by direct contact or inhalation (such as morbillivirus) in target cetacean species, non-target marine mammals, and other animals. For our purposes target cetacean species could include but are not limited to: Cook Inlet Beluga whales, Hawaiian insular killer whales, North Atlantic right whales, southern resident killer whales, and other small BSE stocks of bottlenose dolphins especially populations with low PBR. Non-target marine mammals are species that could have contact with target species thereby spreading disease and could include: other small odontocetes such as striped dolphins, spotted dolphins, harbor porpoises, pygmy sperm whales, dwarf sperm whales, pilot whales, melon-headed whales; other large whales such as fin whales and humpback whales; and pinnipeds such as California sea lions, Steller sea lions, northern fur seals, northern elephant seals, and grey and harp seals. Lastly, wildlife including avian species that are capable of interacting with and spreading the disease to target or non-target marine mammals or their environment are included. Again as mentioned earlier these procedures or a modified version will be applied to any new emerging pathogens in the future where vaccination is needed for response.

Each vaccination response is made by weighing the advantages and disadvantages, and recognizing that a second trigger occurring during a response may increase the level of response. Detection of antibody to a pathogen implies that exposure is occurring, but lack of clinical disease would imply that the pathogen is not causing illness in the population. Thus vaccination response for pathogen exposure without disease would be at a lower level than that to a confirmed case of disease.

All vaccination responses would be maintained as needed to respond to an outbreak. All vaccinated animals would be marked with dorsal fin tags as well as other markings (dye marks, brands, satellite tags, etc.) as determined by the response team based upon the distance at which seals would need to be re-sighted. As feasible, re-sight surveys will be conducted to monitor vaccinated animals. Additionally, during the response phase, surveillance for the target pathogen through necropsy of dead animals and blood and body fluid testing of handled (wild caught and rehabilitated) live animals will be prioritized by MMHSRP. Lastly, 6-12 months post-response

phase, targeted capture-release health assessments of a sub-set of vaccinated animals will be conducted to test animals for antibody titers.

General Prophylactic Vaccination
The best way to protect target cetaceans against these infectious pathogens is to vaccinate prior to population-wide exposures since in-water remote deployment of vaccines or capture-release projects during an outbreak may be difficult depending upon time of year and season. This is especially true if multiple doses of vaccines are required to gain immunity against infections, or if immunity responses take weeks to months to develop. Conversely, vaccines that mount short-term responses against infections or have higher risks of side effects may best be delivered only in the face of population-wide exposures. Based upon the information gained from research and any outbreak response, it will be determined whether prophylactic or solely response-driven vaccinations against target pathogens will be needed to protect cetacean populations at risk. Prophylactic vaccination would initially be implemented by vaccinating any live cetaceans handled in rehabilitation or during live capture-release projects to begin to build herd immunity within the populations at risk. This could be expanded to targeted surveys for the population at risk and the remote application of vaccines via pole syringes, darts, etc. for those species that congregate in areas at certain times of the year.

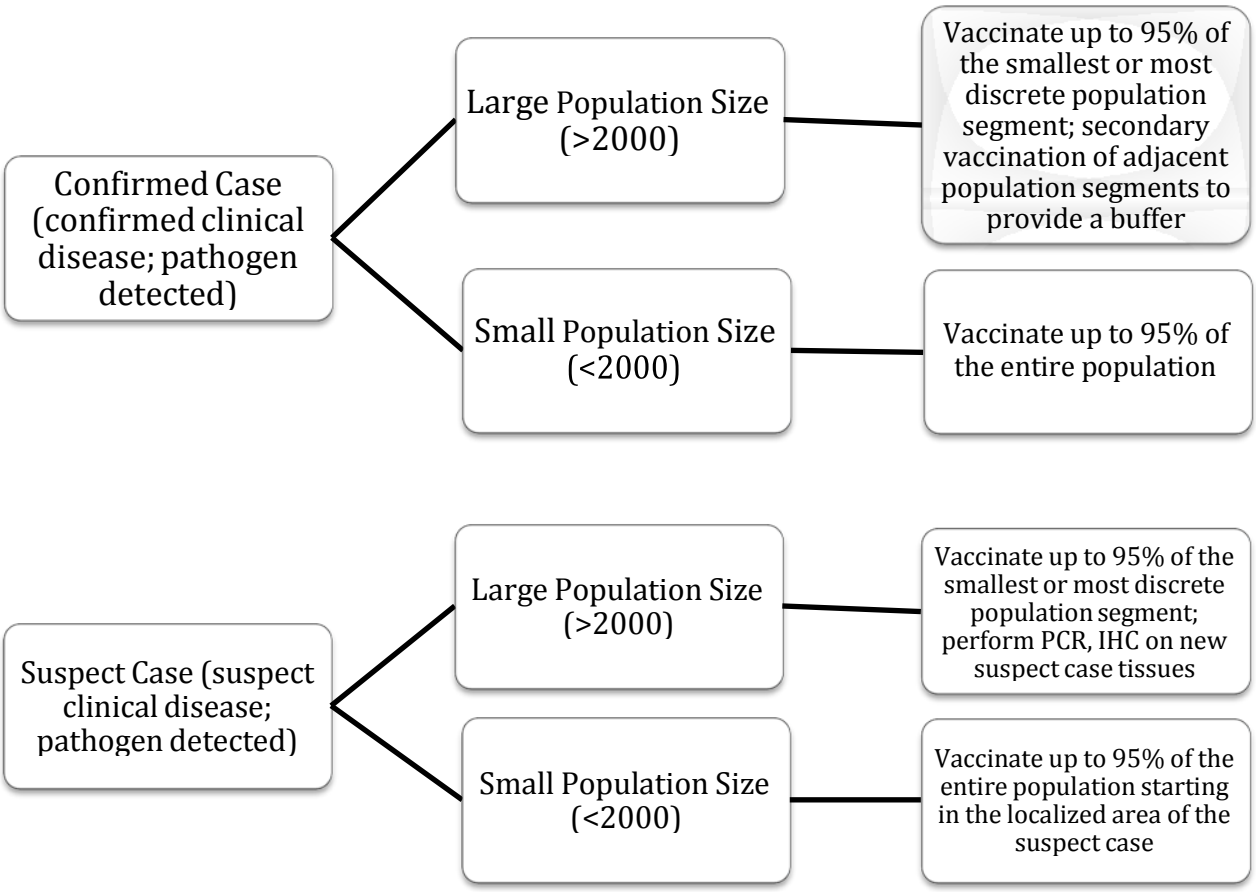
Below are general case definitions for generic pathogens outlining the differences between confirmed and suspect cases of disease and cases of only pathogen exposure.

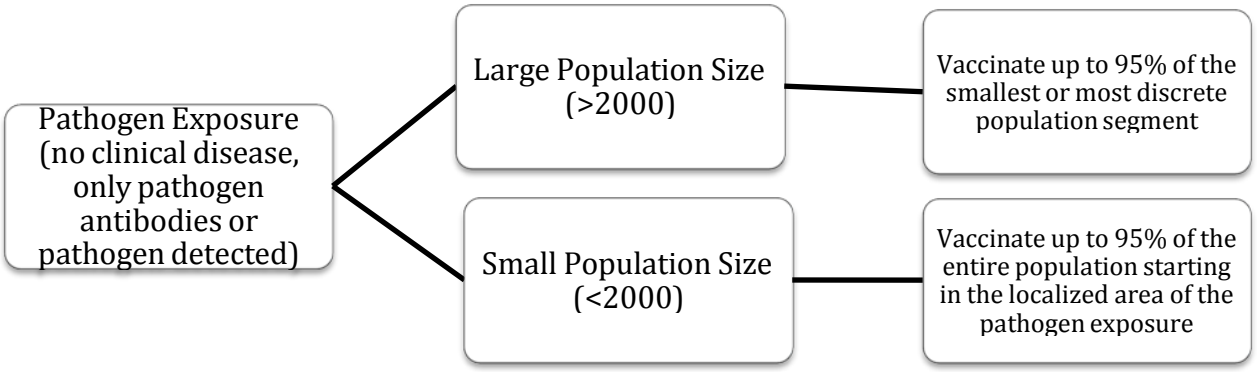
General Pathogen Case Definitions
Confirmed Case: A dead or live animal with CONFIRMED histopathological lesions or clinical signs compatible with the pathogen AND presence of the pathogen in tissues via PCR with confirmed nucleic acid sequencing, culture, OR immunohistochemistry testing.

Suspect Case: A dead or live animal with SUSPECT histopathological lesions or clinical signs compatible with the pathogen AND presence of the pathogen in tissues via PCR with confirmed nucleic acid sequencing, culture, OR immunohistochemistry testing.

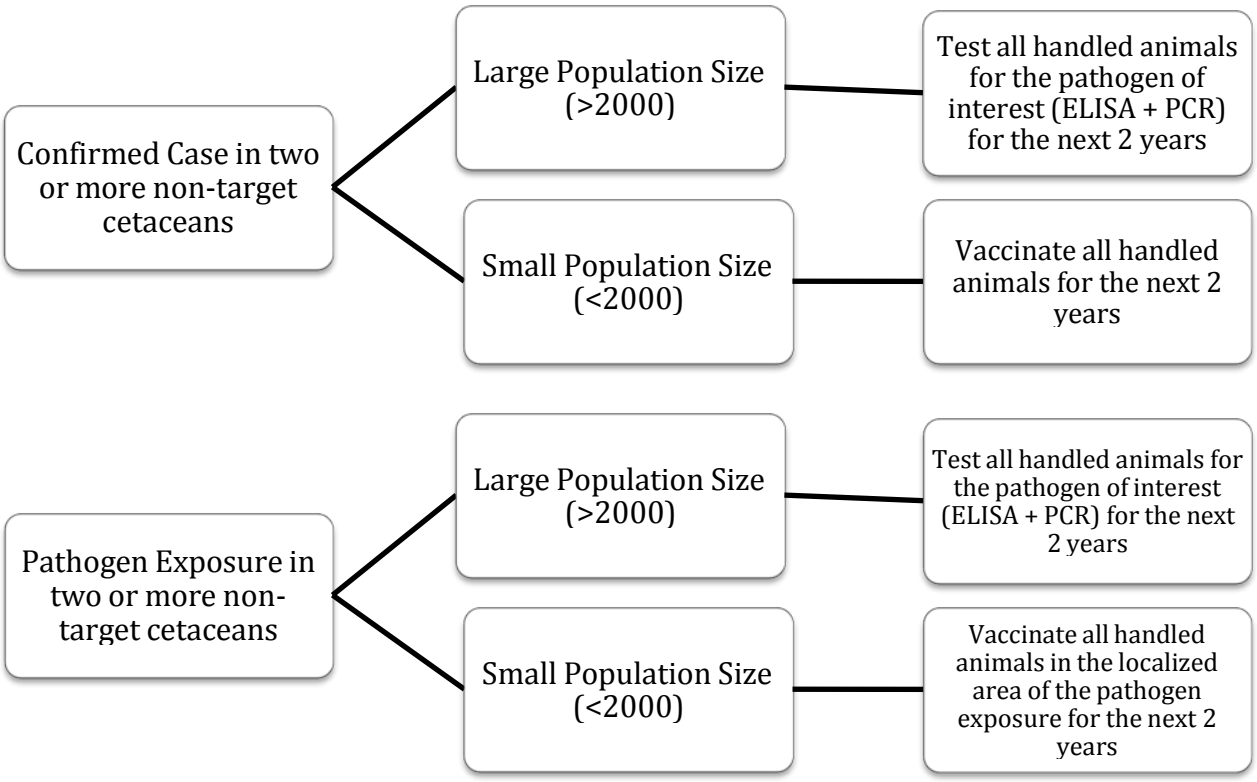
Pathogen Exposure: A dead or live animal with NO histopathological lesions or clinical signs compatible with the pathogen BUT presence of the pathogen in tissues via PCR with confirmed nucleic acid sequencing, culture, OR immunohistochemistry testing OR presence of antibody titers in blood indicating pathogen exposure.

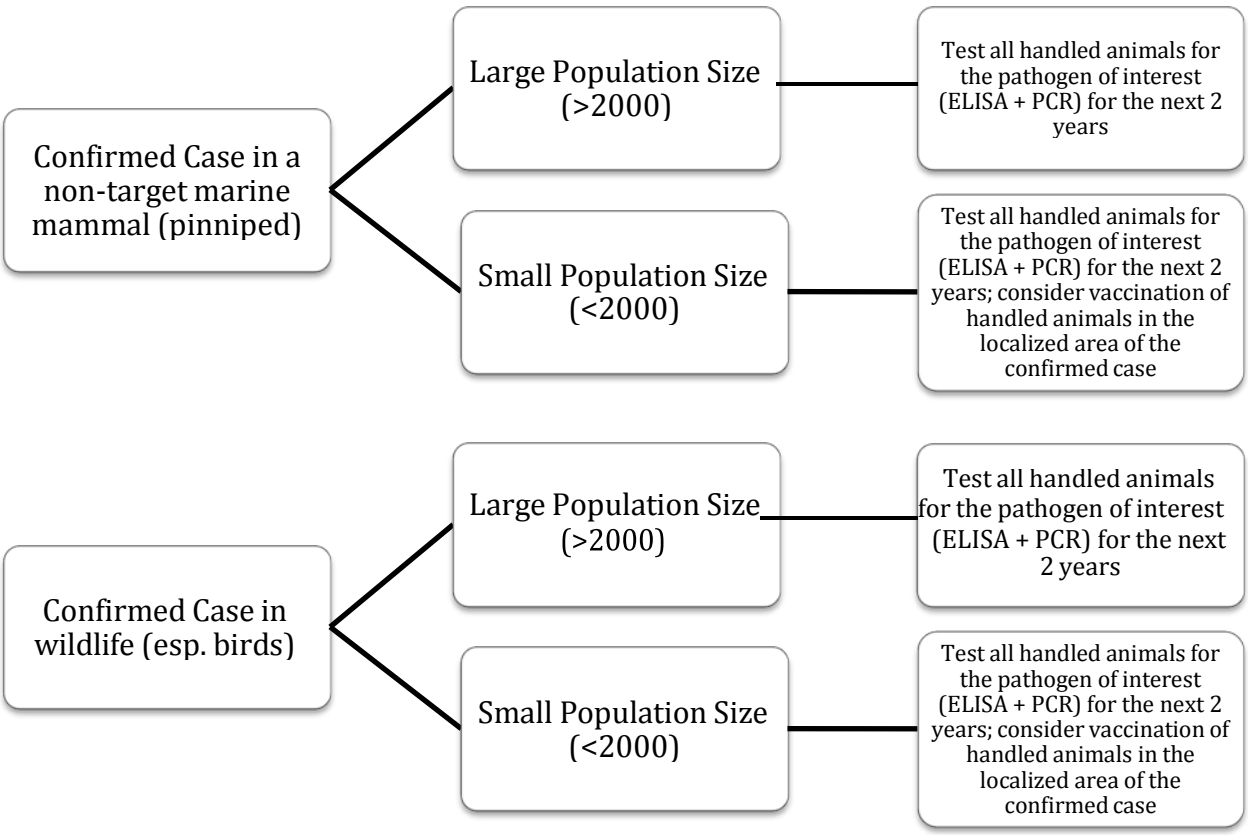
Triggers for a Direct Contact or Inhalation Pathogen Detected in a Target Cetacean





Triggers for a Direct Contact or Inhalation Pathogen Detected in a Non-Target Species





Results of the response to the first trigger event will be used to refine responses to subsequent trigger events. In particular, records will be taken on:

- Time between trigger and administration of vaccine;
- Number of cetaceans vaccinated;
- Time required to vaccinate all or most animals of interest;
- Age distribution of vaccinated animals; and
- Re-sightings of vaccinated animals
- Any indication of adverse reaction to vaccination.

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